The Evolution of China's Nuclear Weapons Program and Doctrine and Its Implications for International Security

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Abstract

As China's power in the international system increases, its strategic policies are changing. This includes its nuclear weapons program and nuclear deterrent policy, viewed as a critical guarantor of Beijing's security and a tool that supports its growing regional and global interests. China's evolving nuclear program and doctrine have multidimensional implications. This study critically examines the drivers of China's ongoing nuclear weapons policy and force modernization by employing neoclassical realism. In doing so, it considers the implications of China's nuclear program for international and regional security, and for strategic stability by exploring relevant case studies and dyads (China-US, China-Japan, China-South Korea, China-India, and China-Taiwan) and speculates on the future trajectory of China's nuclear weapons modernization. In this context, China's contemporary nuclear weapons force modernization is an ongoing process that started in late 2015 under President Xi Jinping's rule.

The hypothesis of this thesis extends from this line of thinking, holding that the emerging nuclear program of China is increasing regional and international strategic insecurity. This involves China, the US and other regional powers, manifested in a "security dilemma".[1] An empirical and analytical approach is used to evaluate the hypothesis and critically deconstruct prevailing discourses. The methodology employs deductive reasoning that uses existing theory as a foundation for formulating and testing the hypothesis.

The findings show that China's nuclear weapons policy and ongoing force modernization drivers are primarily structural. However, internal factors within China, such as its leadership and economic development, and bureaucratic competition between different services of the PLA also play a significant role in shaping China's emerging full-spectrum deterrence posture calibrated towards limited nuclear war fighting. This breeds a spiral of insecurity vis-a-vis the US, Japan, South Korea, Taiwan, and India, is leading to greater strategic and crisis instability and an intensified security dilemma.

[1] Robert Jervis, "Cooperation Under the Security Dilemma," *World Politics*, Vol. 30, No. 2, (1978) 167-214. Robert Jervis, *Perception and Misperception in International Politics* (Princeton, NJ: Princeton University Press, 1976), 66

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List of Abbreviations

A2	Anti-Access
ABM	Anti-Ballistic Missile Treaty
ABNCP	Airborne Command Post
AD	Area Denial
ADB	Asian Development Bank
ADIZ	Air Defense Identification Zone
AEHF	Advanced Extremely High Frequency
AF	Air Force
AG	Australia Group
AI	Artificial Intelligence
AIIB,	Asian Infrastructure Investment Bank
AIP	Air-independent propulsion
ALBM	Air-launched ballistic missiles
ALCM	Air-launched cruise missiles
AMS	Academy of Military Sciences
ASAT	Anti-satellite weapons
ASBM	Anti-Submarine Ballistic Missile
ASS	Assured Strategic Suicide
BAS	Bulletin of Atomic Scientist
BCE	Before Common Era
BMD	Ballistic Missile Defense
BMEWS	Ballistic Missile Early Warning Sites
BRI	Belt and Road Initiative
C2	Command and Control

C3	Command, Control and Communication
C4ISR	Command, Control, Communications, Computers, Intelligence, Surveillance, and Reconnaissance
CAR	Central Asia Republics
CAS	The Chinese Academy of Sciences
CASD	Continuous At-Sea Deterrence
CBM	Confidence Building Measures
CBO	Congressional Budget Office
CC	Central Committee
CCP	Chinese Communist Party
CDS	Cross-domain Solution
CEP	Circular Error Probable
CFR	Council of Foreign Relations
CIA	Central Intelligence Agency
CMC	Central Military Commission
CNAIS	China's National Association for International Studies
CPGS	Conventional Prompt Global Strike
CPS	Conventional Prompt Strike
CPSU	Communist Party of the Soviet Union
CRS	Congressional Research Service
CSC	Central Special Commission
CSD	Cold Start Doctrine
CTBT	Comprehensive Test Ban Treaty
DCA	Dual-capable Aircraft
DEFCON	Defense Readiness Conditions
DIA	Defense Intelligence Agency
DN	Dong Neng

DPP	Democratic Progressive Party
DSP	Defense Support Program
DTTI	Defense Technology and Trade Initiative
ECS	East China Sea
EDD	Extended Deterrence Dialogue
EEU	Eurasian Economic Union
EEZ	Exclusive Economic Zones
ELINT	Electronic Intelligence
FAS	Federation of American Scientists
FMCT	Fissile Material Cut-off Treaty
FY	Fiscal Year
GBI	Ground Based Interceptors
GBSD	Ground-Based Strategic Deterrent
GDP	Gross Domestic Product
GMD	Ground-Based Midcourse Defense
GOT	Go-Onto-Target
HGV	Hypersonic Glide Vehicle
IAEA	International Atomic Energy Agency
ICAN	International Campaign to Abolish Nuclear Weapons
ICBM	Intercontinental Ballistic Missiles
IMF	International Monetary Fund
INF	Intermediate-Range Nuclear Forces Treaty
INS	Indian Navy Ship
IR	International Relations
IRBM	Intermediate-Range Ballistic Missile
ISR	Intelligence, Surveillance and Reconnaissance
JASSM-ER	Joint Air-to-Surface Standoff Missile - Extended Range

JASSM	Joint Air-to-Surface Standoff Missile
KG	Kilograms
KM	Kilometers
KMPR	Korea Massive Punishment and Retaliation
KMT	Kuomintang Part
KT	Kilotons
LAC	Line of Actual Control
LARSM	Long-range Anti-Ship Missile
LDP	Liberal Democratic Party (Japan)
LEP	Life Extension Program
LRSO	Long-range Standoff (weapons)
MAD	Mutually Assured Destruction
MDA	Missile Defense Agency
MDR	Missile Defense Review
MILSTAR	Military Strategic and Tactical Relay
MIRV	Multiple Independently Targetable Re-entry Vehicle
MNC	Multinational Corporations
MRBM	Medium-Range Ballistic Missile
MTCR	Missile Technology Control Regime
NAM	National Airborne Operations Center
NAOC	National Airborne Operations Center
NASIC	National Air and Space Intelligence Center
NATO	North Atlantic Treaty Organization
NC3	Nuclear Command, Control and Communication
NMD	National Missile Defense
NDISC	National Defense Industry Special Commission
NDP	National Defense Policy

NDS	National Defense Strategy
NFU	No-First-Use
NGO	Non-governmental Organization
NMCC	National Military Command Center (US)
NMS	National Military Strategy (US)
NSS	National Security Strategy
NNWS	Non-Nuclear Weapons States
NORAD	North American Aerospace Defense Command
NPR	Nuclear Posture Review (US)
NPT	Nuclear Non-Proliferation Treaty
NSA	National Security Advisor (US)
NSA	National Security Advisory
NSC	National Security Council (UN)
NSG	Nuclear Suppliers Group
NSS	National Security Strategy (US)
NWFZ	Nuclear Weapons Free Zone
NWS	Nuclear Weapons State
PAC	Patriot Advanced Capability
PAROS	Preventing an Arms Race in Outer Space
PGS	Precision Guided Strike
PLA	People’s Liberation Army
PLAAF	People’s Liberation Army - Air Force
PLAN	People’s Liberation Army - Navy
PLARF	People’s Liberation Army - Rocket Force
PLASAF	People’s Liberation Army - Second Artillery Force (now Rocket Force)
PLASSF	People’s Liberation Army - Strategic Support Force
PRC	People’s Republic of China

PTBT	Partial Test Ban Treaty
QDR	Quarterly Defense Review
QUAD	Quadrilateral Security Dialogue
RAND	Research and Development (organization)
ROC	Republic of Korea
SSA	Strategic Situational Awareness (systems)
SAC	Second Artillery Corps
SAC	Strategic Air Command (US)
SALT	Strategic Arms Limitation Talks
SAM	Surface-to-Air Missile
SBIRS	Space Based Infrared System
SC4ISR	Space and Command, Control, Communication, and Computer, Intelligence, Surveillance, and Reconnaissance
SCO	Shanghai Cooperation Organisation
SCS	South China Sea
SDF	Self-Defense Force (Japan)
SIOP	Single Integrated Operational Plan
SIPRI	Stockholm International Peace Research Institute
SLBM	Submarine-Launch Ballistic Missile
SLCM	Submarine-Launch Cruise Missile
SLF	Super Low Frequency
SLOC	Sea Lanes of Communications
SMF	Strategic Missile Force (PLA)
SMS	Science of Military Strategy (PLA)
SOP	Standard Operating Procedures
SORT	The Strategic Offensive Reductions Treaty
SRBM	Short-Range Ballistic Missile

SSAC	Science of Second Artillery Campaigns
SSBN	Ballistic Missile Submarines
SSK	Diesel-Electric Attack Submarines
SSN	Nuclear-Powered Attack Submarines
START	Strategic Arms Reduction Treaty
SU	Soviet Union
TEL	Transporter Erector Launchers
THAAD	Terminal High Altitude Area Defense
TNW	Tactical Nuclear Weapons
TPNW	The Treaty on the Prohibition of Nuclear Weapons
TRA	Taiwan Relations Act
UK	United Kingdom
UN	United Nations
UNGA	United Nations General Assembly
UNSC	United Nations Security Council
US	United States
USA	United States of America
USD	United States Dollar
USEUCOM	United States European Command
USFJ	United States Force Japan
USFK	United States Forces Korea
USNDS	US Nuclear Detonation Detection System
USSR	Union of Soviet Socialist Republics
WA	Wassenaar Arrangement
WB	World Bank
WMD	Weapons of Mass Destruction
WWII	World War Two

The fox knows many things, but the hedgehog knows one big thing.

- Archilochus, Greek poet

He, thinking I was about to kill him in self-defense, was about to kill me in self-defense, so I had to kill him in self-defense.

- Thomas Schelling

Introduction

The unipolar world, which emerged after the collapse of the Soviet Union in 1991, has now transformed into a multipolar environment where the United States (US) and China are the most significant players.[2] Additionally, globalization has drastically transformed the international system and international structure through which states interact and compete.[3] The scientific and technological changes it brings have generated a debate over whether scientific advancements have predominantly altered the relations between humans or the conduct between international actors.[4] Against the backdrop of an increasingly globalized, emerging multipolar international system, the political-strategic relations among nuclear nations are becoming more complex and interdependent, and threats are now both more diffuse and uncertain. Competition remains inherent in interstate relations, and the international system is becoming more unpredictable.

It remains a fact that full-scale conflict involving nuclear weapons would lead to nuclear winter and be devastating for the entire globe.[5] This thesis concerns itself with the politics among great powers in this context, where the leaders of these powers are struggling to establish a common strategic foundation and understanding in a new era of competition – an understanding that is necessary to reduce mistrust and suspicion at a time when increasingly globalized issues that threaten all states need to be addressed. Efforts in recent years to direct intensifying great power competition in a positive direction have been difficult to achieve, particularly in critical areas where progress is essential, such as nuclear arms control and disarmament, strategic deterrence and stability, missile defense, and space weaponization. It is these issues, and especially the *strategic dimensions and evolution of China's evolving nuclear weapons program* that this PhD interrogates

[2] John Mearsheimer, "We are Moving to a Multipolar World with Three Great Powers," *Valdai Club*, January 19, 2017, accessed March 20, 2021, https://www.youtube.com/watch?v=yoWMn8H7u1Q; Stephen Walt, "The World Order after the Pandemic", *Institute of International European Affairs*, October 2, 2020, accessed March 20, 2021, https://www.youtube.com/watch?v=7WoOje_mDNQ

[3] 'Globalisation' emphasises the temporal and geographic expansion of integrated economic structures, diffusion of communications, technology, and culture. See Ian Clark, *Globalization and Fragmentation: International Relations in the Twentieth Century*, (USA: Oxford University Press, 1997); Robert Patman, *Globalization and Conflict: National Security in a 'New' Strategic Era*, (New York: Routledge, 2006)

[4] James N. Rosenau, *Turbulence in World Politics: A Theory of Change and Continuity* (Princeton: Princeton University Press, 1990), argues that the real power behind the transformation in IR is technology; and for the level of analysis, debate see J. David Singer, "The Level-of-Analysis Problem in International Relations", *World Politics*, Vol. 14, No. 1, (October 1961), 77-92

[5] A nuclear winter would be the outcome of nuclear blasts producing enough smoke to significantly block the light and heat from sun, reducing the atmospheric temperature of the earth below to the freezing point. Sarah Derouin, "Nuclear Winter May Bring a Decade of Destruction", *EOS*, September 27, 2019, accessed November 25, 2021, https://eos.org/articles/nuclear-winter-may-bring-a-decade-of-destruction

critically. The research is motivated to answer two core questions: (1) What accounts for the emergence of China's nuclear program and why has it evolved in the manner is has? and (2) What are the implications of its evolution for regional and global security?

In the international relations and strategic studies literature, scholars have identified several factors that drive military modernization: security imperatives, domestic politics, technological evolution, prestige, and a state's economic growth.[6] Furthermore, states that rise in power inevitably acquire new interests and aspirations. If they are dissatisfied with the existing order, they may become revisionist and seek to change the status quo.

Status quo states see rising states as challengers to international arrangements that benefit them. Generally, both revisionists and status quo states perceive their objectives and behavior to be 'defensive' – hence according to defensive realists, their interactions lead to the security dilemma where all sides feel they are legitimately acting defensively even if they feel compelled to take assertive and even military actions – including military modernization and build-up – to protect themselves.[7] The resulting tit-for-tat spiral of behavior heightens mutual threat perceptions, deepens mistrust and increases the likelihood of conflict.[8] These dynamics appear to apply to contemporary US-China strategic relations, which notably deteriorated after the election of Donald J. Trump in the United States (US) in 2017, as the Trump administration formally elevated China to a *strategic competitor* through the December 2017 National Security Strategy (NSS), and the 2018 National Defense Strategy (NDS).[9] The 2018 Nuclear Posture Review (NPR) mentions that the US "does not wish to regard either Russia or China as an adversary and seeks stable relations with both"[10] The document, however, does frame Beijing (and Russia) as 'adversaries' in broad terms – the word 'China' is used forty-seven times in

[6] Scott D. Sagan, "Why Do States Build Nuclear Weapons?: Three Models in Search of a Bomb," *International Security* Vol. 21, No. 3, (1989) 54-86; Joseph Cirincione, *Bomb Scare: The History and Future of Nuclear Weapons* (New York: Columbia University Press, 2007), 47; Michael Beckley, "Economic Development and Military Effectiveness," *The Journal of Strategic Studies*, Vol. 33, No. 1, (2010) 43–79

[7] Paul Kennedy, *The Rise and Fall of the Great Powers: Economic Change and Military Conflict from 1500 to 2000,* (London: Unwin Hyman, 1988); Graham Allison, *Destined for War: Can America and China Escape Thucydides' Trap?* (London: Scribe, 2017); John Mearsheimer, *Tragedy of Great Power Politics* (New York: W.W. Norton and Company, 2001)

[8] Ibid

[9] For US NDS, please see https://www.defense.gov/Portals/1/Documents/pubs/2018-National-Defense-Strategy-Summary.pdf; for US NSS, please see https://www.whitehouse.gov/wp-content/uploads/2017/12/NSS-Final-12-18-2017-0905.pdf

[10] Nuclear Posture Review, February 2018, accessed January 20, 2020, https://media.defense.gov/2018/Feb/02/2001872886/-1/-1/1/2018-NUCLEAR-POSTURE-REVIEW-FINAL-REPORT.PDF, p. VI

the document (an increase from the thirty-seven times it was mentioned in the 2010 NPR).[11] The words competitor and adversary are not synonyms. According to Edward Goldberg, competitors are "positive, forcing a company or a country to step up their game," whereas Michael Ignatieff views an adversary as "someone you want to defeat."[12] Therefore, the US intent appears to be to defeat its adversaries if there is a war, with deterrence being a critical element in ensuring war does not break out in the first place.

Against the backdrop of the growing competition between the US and China, it is critical to understand the transformations and developments in China's nuclear weapons program and nuclear doctrine and their implications for regional and global security. Examining this is also important because China is an "emerging potential superpower", and possesses an increasing level of economic resources to direct towards military and nuclear weapons force modernization, and invest in related fields such as cyber and space.[13] Moreover, the international system is arguably shifting to multipolarity, establishing a basis for intense competition between the US and China. These developments collectively have immense implications for regional and international security relations and inspire important academic questions (raised below) which are largely unaddressed.[14]

A state's *nuclear weapons use doctrine* is a critical part of its overall nuclear weapons program. It represents the central beliefs or principles for how, if war occurred, a state would wage a nuclear war to achieve its desired ends.[15] Thus, the doctrine outlines *ways* nuclear weapons would be used as a means against a given type of threat or in a conflict

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[11] Nuclear Posture Review, February 2018, accessed January 20, 2020, https://media.defense.gov/2018/Feb/02/2001872886/-1/-1/1/2018-NUCLEAR-POSTURE-REVIEW-FINAL-REPORT.PDF; Nuclear Posture Review Report April 2010, accessed January 20, 2020, https://dod.defense.gov/Portals/1/features/defenseReviews/NPR/2010_Nuclear_Posture_Review_Report.pdf

[12] Paul Poast, "Competitors, Adversaries, or Enemies? Unpacking the Sino-American Relationship," *War On The Rocks*, October 14, 2020, accessed April 24, 2021, https://warontherocks.com/2020/10/competitors-adversaries-or-enemies-unpacking-the-sino-american-relationship/; Edward Goldberg, China: enemy or competitor? *Salon*, June 22, 2019, accessed April 24, 2021, https://www.salon.com/2019/06/22/china-enemy-or-competitor/; Michael Ignatieff, "Enemies vs. Adversaries," *The New York Times*, October 16, 2013, accessed April 24, 2021, https://www.nytimes.com/2013/10/17/opinion/enemies-vs-adversaries.html

[13] Hu Angang, *China in 2020: A New Type of Superpower* (Washington D.C., Brooking Institution Press, 2011), 140-162; Kamal, Tasiu Abdullahi and Joseph Phiri, "Study on the rise of China as a dangerous superpower," *International Journal of Multidisciplinary Research and Development*, Vol. 6. No 1, (2019) 133-137; Nadav Morag, *From Poverty to Power: What China's Emerging Status as a Superpower Means for the United States*, Colorado Technical University (July 2012), accessed April 24, 2021, https://www.coloradotech.edu/Media/Default/CTU/documents/resources/ctu-china-backgrounder.pdf

[14] Stephen Brooks and William Wohlforth, "The Rise and Fall of the Great Powers in the Twenty-first Century" *International Security*, Vol. 40, No. 3, (2016) 7-53.

[15] Aaron P. Jackson, *The Roots of Military Doctrine: Change and Continuity in the Practice of Warfare* (Fort Leavenworth, KA: Combat Studies Institute Press, 2013).

scenario. Nuclear weapons doctrines might be tailored to deal with a *specific threat*, based on varying geography, nature of the threat, military to military comparison, as was the case during the Cold War;[16] it may encompass a very service-oriented approach involving nuclear weapons force/service only, and/or a joint approach to warfare involving both conventional and nuclear force.[17]

Behind every nuclear weapon doctrine, there are two underlying questions: the first, What kind of role does a state envisage for nuclear weapons in addressing their security challenges? and the second, With how much clarity and specificity, or conversely ambiguity, should the nuclear weapons doctrine be expressed?[18] Therefore, from this perspective, China's nuclear evolution is specifically worthy of examination because it shines a light on two issues. The first is, what factors motivate China's ongoing nuclear weapons force modernization efforts and, the second, what may be the future direction of China's emerging nuclear weapons program, and doctrine. And additionally, what the implications of its evolving program are. It is important to explore and understand these issues using the theoretical framework of neoclassical realism because this approach informs our understanding of the drivers of change in China's nuclear weapons force modernization and policies, and its threat perception. Together, these factors will help us understand how China's future nuclear modernization is influencing, and will influence, regional strategic stability and order, and the effects it has on great power politics at the international level.

Central Research Focus, Hypothesis and Objectives

There are two sides to the debate among scholars and analysts in China over the future of China's nuclear weapons program. One side, which includes Li Bin and Tong Zhao, believes China will continue to sustain a self-defensive (or 'minimum deterrent') program.[19] The other side, which includes notable figures such as Major General Jin

[16] Barry R. Posen, *The Sources of Military Doctrine: France, Britain, and Germany between the World Wars* (Ithaca: Cornell University Press, 1984)
[17] Stephen Peter Rosen, *Winning the Next War: Innovation and the Modern Military* (Ithaca: Cornell University Press, 1991); Gray presents a similar argument, see Gray, *The Strategy Bridge: Theory for Practice* (New York: Oxford Unversity Press, 2010), 76-79.
[18] Mahesh Shankar and T. V. Paul, "Nuclear doctrines and stable strategic relationships: The case of South Asia," *International Affairs,* Vol. 92, No. 1, (January, 2016) 1-20.
[19] Li Bin and Tong Zhao, *Understanding Chinese Nuclear Thinking* (MA, Washington D.C., Carnegie Endowment for International Peace, 2016); Sun Xiangli, "China's Nuclear Strategy: Nature and Characteristics," *World Economics and Politics*, No. 9 (2006) 28; for more detail also see Liping Xia, *China's Nuclear Doctrine: Debates and Evolution, Carnegie Endowment for International Peace (CEIP*),

Yi'nan, a professor at China's National Defense University, believes that China will eventually and overtly give up its nuclear *No-First-Use* (NFU) posture that is tied to a long-standing self-defensive posture due to deteriorating (from Beijing's view) regional and global security dynamics.[20] Adopted in 1964, China's NFU posits that Beijing will use nuclear weapons only to respond to a nuclear attack. However, some analysts believe that as China's power grows, it will naturally bolster its nuclear forces commensurate with its anticipated future status as a full-scale superpower.[21] One thing on which most international security scholars and practitioners agree is that China's nuclear posture is evolving towards one that will have a significant impact on the policies of other states.[22] The hypothesis of this thesis extends from this line of thinking, holding that China's emerging nuclear program is leading towards more significant regional and international strategic insecurity. This involves China, the US and other regional powers, manifested in a "security dilemma".[23] This thesis seeks to test this hypothesis. In short, the evolution of China's nuclear weapons program will not occur in a vacuum, but will generate counter-reactions in other states – and these reactions are already discernible as this thesis reveals.

Against this backdrop, this study has *three main objectives*. The *first* is to consider how China's nuclear weapons program has evolved over time and what it means for regional and international security when it comes to the security dilemma. A security dilemma is arguably the theoretical linchpin of defensive realism, an important variant of realist theory in international relations. According to Robert Jervis, the security dilemma is the result of "unintended and undesired consequences of actions meant to be defensive, many of the means by which a state tries to increase its security decrease the security of others,"

June 30, 2016, accessed November 15, 2017, https://carnegieendowment.org/2016/06/30/china-s-nuclear-doctrine-debates-and-evolution-pub-63967

[20] Zhenqiang Pan, "A Study of China's No-First-Use Policy on Nuclear Weapons", *Journal for Peace and Nuclear Disarmament*, Vol. 1, Issue 1, (2018) 115-136; Zhao Xijun, [*Intimidation Warfare: A Comprehensive Discussion of Missile Deterrence*] (hereafter, IW) (Beijing: National Defense University Press, 2005)

[21] Nan Li, "China's Evolving Nuclear Strategy: Will China Drop "No First Use?" *China Brief*, Vol. 18, No. 1, January 12, 2018, accessed March 19, 2018, https://jamestown.org/program/chinas-evolving-nuclear-strategy-will-china-drop-no-first-use/; Zhenqiang Pan, "A Study of China's No-First-Use Policy on Nuclear Weapons," 115-136

[22] James Johnson, "China's Evolving Approach to Nuclear War-Fighting," *The Diplomat*, November 22, 2017, accessed March 19, 2018, https://thediplomat.com/2017/11/chinas-evolving-approach-to-nuclear-war-fighting/; Michael S. Chase, "Assessing China's Evolving Nuclear Capabilities," in Chung J.H. (eds.) *Assessing China's Power*, (New York: Palgrave Macmillan, 2005); Nan Li, "China's Evolving Nuclear Strategy: Will China Drop "No First Use?"

[23] Robert Jervis, "Cooperation Under the Security Dilemma," *World Politics*, Vol. 30, No. 2, (January 1978) 167-214

and "one state's gain in security often inadvertently threatens others."[24] A detailed elaboration of the concept is carried out in Chapter One.

The *second objective* of the research is to contribute to the existing literature; there is a limited body of literature on China's nuclear weapons doctrine and force modernization.[25] The existing research usually views it from one perspective, focusing on the external drivers of change, which also need to be advanced and brought up-to-date in light of recent developments. The internal drivers of change are overlooked in the existing body of literature. Using neoclassical realism, the research will critically examine the role of both internal and external drivers of change. The implications of China's force modernization for its primary competitor, the US, for the broader Indo-Pacific security landscape, and for the US-led regional security architecture also require additional research as these are under-explored and under-developed. The *third objective* is to examine the future outlook of China's nuclear weapons program. Though considering this inherently requires speculation, the research draws on the existing nuclear weapons force capabilities of China, the historical and emerging force modernization trends (how Chinese forces have been evolving – numbers, types, etc.), policy statements made by Chinese officials and prestigious scholars about the possible future trajectory. To achieve these research objectives, the thesis poses and answers the research questions below.

Research Questions

This study is motivated by two primary research questions:

a. What accounts for the emergence of China's nuclear weapons program, and what has propelled its evolution since its inception?
b. What are the implications of China's evolving nuclear weapons program for regional and global security?

Several secondary research questions are also considered throughout the chapters. These include:

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[24] Robert Jervis, *Perception and Misperception in International Politics* (Princeton, NJ: Princeton University Press, 1976), 66; Robert Jervis, "Cooperation under the Security Dilemma," *World Politics*, Vol. 30, No. 2, (January 1978) 169-170

[25] Susan Turner Haynes, "China's Nuclear Threat Perceptions," *Strategic Studies Quarterly*, Vol. 10, No. 2 (Summer 2016), 25-62; Xiaoping Yang, "China's Perceptions of India as a Nuclear Weapons Power," *Carnegie Edowment for International Peace (CEIP)*, June 30, 2016, accessed July 26, 2021, https://carnegieendowment.org/2016/06/30/china-s-perceptions-of-india-as-nuclear-weapons-power-pub-63970; Tong Zhao, "What's Driving China's Nuclear Buildup?, Commentary," *CEIP*, August 5, 2021, accessed December 19, 2021, https://carnegieendowment.org/2021/08/05/what-s-driving-china-s-nuclear-buildup-pub-85106

a. What explains the possible abandonment by China of its long-standing nuclear NFU policy?[26]
b. How have state(s) responded to China's nuclear strategy, and how are they likely to do so in the future as China's nuclear program continues to evolve?

It is crucial to answer the questions above because the interaction between China and other powers' strategic policies is likely to shape the future of strategic stability and crisis stability. Strategic stability is defined as a "characteristic of deterrence based on mutually assured destruction and has been measured largely in terms of the potential vulnerability of strategic force components, notably land-based missiles."[27] The idea of crisis stability in the nuclear realm is that, in a crisis involving nuclear weapons states, the risk of a nuclear war increases if states believe that using nuclear weapons first could lead to a decisive advantage over others.[28]

Additionally, the answers to the research questions will help us understand the evolving nuclear arms race and the nuclear use doctrine of states. Answers to these questions also provide a deeper understanding of China's existing and emerging nuclear weapons program, recent reactions from Beijing's competitor(s), and likely future reactions.

Research Scope

The research scope includes the evolution of China's nuclear weapons program until the end of 2021, and what made it a relatively restrained nuclear weapons program until recently when it became a much more dynamic program under President Xi Jinping, involving internal and/or external factors driving major changes. The research scope also includes the security and strategic implications for nuclear weapons states such as the US and India, and including those states that have extended nuclear deterrence guarantees from Washington in Beijing's proximate region, such as Japan and South Korea. The study draws on the literature on nuclear weapons and deterrence from the Cold War and

[26] To answer this, some other questions must be addressed, such as: Is China operationally capable of altering its NFU policy? Giving up this policy for an active policy would require China to have strong intelligence, surveillance and reconnaissance (ISR) infrastructure to allow a launch-on-warning posture. What would be the likely effect of abandoning its NFU on China's operational doctrines for its retaliatory nuclear capabilities? How does delegation of control pose challenges for China's command and control system, and for establishing an effective deterrence posture?
[27] John D. Steinbruner, "National Security and the Concept of Strategic Stability, *The Journal of Conflict Resolution*," Vol. 22, No. 3, (1978) 411
[28] Wolfgang Heisenberg, "Strategic and Crisis Stability," *Bulletin of Peace Proposals*, Vol. 16, No. 3, (1985) 227

post-Cold War era, which established the foundation for contemporary and future nuclear power relations.

The temporal scope of the research covers developments that have taken place in China's nuclear weapons program, starting soon after its creation in 1949, until 2021. Although there are competing international relations theories, the study mainly utilizes neoclassical realism, and nuclear deterrence theory. These establish a set of theoretical parameters for analysis throughout the thesis. Although liberalism, like realism, agrees to the notion of anarchy that exists at the structural level (anarchy being the lack of an international sovereign), liberals and realists differ on the point that international institutions and organizations will act as a significant check to the pernicious forces unleashed by anarchy through 'collective security'.[29] For realists, anarchy is the source of conflict and international organizations are not sufficient to bring an end to competition or, at worst, conflict. Therefore, survival is the primary objective of states that pushes them towards self-help and alliance-building strategies.[30] Anarchy, to realists, is a given in the international system and unlikely to wither away without a fundamental change in the nature of international relations. This differs from constructivists, who are more idealist as they believe anarchy "is what states make of it."[31] Realism, particularly neoclassical realism, tends to focus on both internal and external elements involved in developing the foreign and security policy of a state, in doing so, it actually takes into account constructivist's focus on the internal aspects of states (such as the role of individuals and changing conceptions of identity). It is considered to be a more suitable theoretical framework for this scholarship, given it examines competitive relations between states and realism is the dominant theory in the literature on nuclear weapons, modernization, doctrine, and deterrence. As such, Chapter One is dedicated to an in-depth examination of neoclassical realism and the theory of nuclear deterrence.

One caveat must be mentioned here: any assessment of Chinese capabilities, views on its conventional and nuclear policies and military doctrine, must recognize that primary data

[29] Paul Schroeder, "Correspondence History vs. Neo-realism: A Second Look," *International Security*, Vol. 20, No. 1, (Summer 1995) 182-195; Kenneth Waltz, "The Origins of War in Neorealist Theory," *The Journal of Interdisciplinary History*, Vol. 18, No. 4, ((1988) 615-628

[30] Hans Morgenthau, *Politics Among Nations: The Struggle for Power and Peace* 5th edition (New York: Alfred A. Knopf, 1979)

[31] Alexander Wendt, "Anarchy is what States Make of it: The Social Construction of Power Politics," *International Organization*, Vol. 46, No. 2, (Spring, 1992) 391-425; Kenneth Waltz, *Theory of International Politics*, (New York: McGraw-Hill, 1979); Kenneth Waltz, *Man, the State and War: a Theoretical Analysis* (New York: Columbia University Press, 1959)

sources remain scarce but are increasing. Studying Chinese security and nuclear-related issues is challenging because of restricted and inadequate access to government documents, official Chinese defense policies, war strategies and plans, and what precisely informs their leaderships decisions. Despite these issues, the study managed to draw upon the open-source literature and research that does exist on China's nuclear weapons program, doctrine and strategy (from Chinese and non-Chinese sources). This was supplemented through conversations between the author and Chinese scholars to cross-check for accuracy the facts and debates available in the open-source literature.

Methodology

An empirical-analytical and interpretative approach is used to critically evaluate and deconstruct prevailing discourses. The methodology employs deductive reasoning that uses existing theory as a foundation for formulating and testing the hypothesis. As the interpretive method involves rigorous interpretation and analytical disclosure to understand subjective knowledge, it, therefore, needs cautious interpretation of the variables involved to maintain the objectivity of research and the resulting conclusions.

Based on the methodology above, scholarship draws upon both primary and secondary resources. Primary sources include official publications from relevant government departments, military academies, institutions, and scholars on military strategies and doctrines. These also include official documents, archives, declassified documents, memoirs, and selected works of key political elites involved in policymaking. The scholarship is informed by unstructured conversations between the author and Chinese IR scholars to assist with interpreting relevant facts and documents. Secondary sources include books, articles, working group papers, and think tank research reports.

Overview of the International System

Before examining contemporary debates on China's nuclear weapons program, it is imperative to establish a foundation for the research by outlining the origin of global nuclear politics. As noted above, when China became a nuclear weapons state in 1964, the international system was predominantly bipolar, wherein the US and the Union of Soviet Socialist Republics (USSR) were competing for power and hegemony, and defining the rules of the fledging nuclear order. According to William Walker, the nuclear world order the US and USSR constructed consisted, and continues to consist, of two linked systems: a mutually arranged system of deterrence and international nuclear non-

proliferation efforts.[32] Deterrence, to mention briefly here (and elaborated further in the next chapter), is defined as the use of threat or punishment to change an adversary's behavior. The US and the USSR, through the managed system of deterrence, pursued a rules-based order for deterrence and strategic stability. For instance, they established arms control arrangements. This included the Nuclear Non-proliferation Treaty (NPT) which came into force in 1970, SALT I which came into force in 1972, the first series of Strategic Arms Limitation Talks, the Anti-Ballistic Missile (ABM) Treaty which came into force in 1972, Strategic Arms Reduction Treaty (START) which was established in 1994, the Intermediate-Range Nuclear Forces Treaty which came into force in 1988, and New START which came into force in 2011, outlined later in the thesis. They also managed a nuclear non-proliferation order wherein many states agreed not to develop, or to relinquish, their nuclear weapons program in exchange for specific commitments and obligations provided by the official nuclear powers related to extended nuclear deterrence and transfer of nuclear technology for peaceful purposes.[33] The following section focuses on the evolution of global nuclear politics to establish a brief context for examining China's nuclear weapons program throughout this thesis.

Significance of the Distribution of Power

In the twenty-first century, the global distribution of power, measured by the number of poles in the system and level of concentration [34] of power (concentration, unlike hegemony or group size, captures both the number of major powers and the relative inequalities of power among them) has altered significantly. This has major implications

[32] Rebecca Davis Gibbons, "The Future of the Nuclear Order," *Arms Control Today*, April 2019, accessed March 23, 2021, https://www.armscontrol.org/act/2019-04/features/future-nuclear-order#:~:text=An%20often%20overlooked%20component%20of,the%20world's%20most%20powerful%20states.; William Walker, "Nuclear Order and Disorder," *International Affairs*, Vol. 76, No. 4, (2007) 703-724; Steven E. Miller, Robert Legvold, and Lawrence Freedman, *Meeting the Challenges of the New Nuclear Age: Nuclear Weapons in a Changing Global Order*, (Cambridge, Mass.: American Academy of Arts and Sciences, 2019), 19-26

[33] "Treaty on the Non-Proliferation of Nuclear Weapons (NPT) Text of the Treaty," *United Nations*, Office of the Disarmament Affairs, https://www.un.org/disarmament/wmd/nuclear/npt/text/; Li Bin, "The Revival of Nuclear Competition in an Altered Geopolitical Context," *Daedalus* Vol. 149, No. 2, (Spring 2020), 56-68; Lewis Dunn, Gregory Giles, Jeffrey Larsen, and Thomas Skypek, "Foreign Perspectives on U.S Nuclear Policy and Posture: Insights, Issues and Implications," *Defense Threat Reduction Agency*, December 12, 2006; George Perkovich, "Extended deterrence on the way to a nuclear-free world," Research Paper, *International Commission on Nuclear, Non-proliferation and Disarmament*, May 2009; Patrick M. Morgan, T.V. Paul, and James Wirtz, (eds.) *Complex Deterrence: Strategy in the Global Age*, (Illinois: University of Chicago Press, 2009); Scott D. Sagan, "The Case for No First Use," *Survival*, Vol. 51, No 3, (2009) 163-182

[34] Edward D. Mansfield, "Concentration, Polarity, and the Distribution of Power," *International Studies Quarterly* Vol. 37, No. 1, (1993) 105-128

for international politics and the institutions of global governance. International relations theories suggest several reasons why the power distribution in the international system and power fluctuation matters. To prominent realists, such as John Mearsheimer and Kenneth Waltz, a state's behavior is powerfully shaped by its position in the international system and structure of power, and international institutions reflect power dynamics at the international level; the most powerful states often have the most influence in the institutions.[35] They maintain that international institutions have little meaningful influence on the behavior of states if the great powers do not want them to and thus they present little opportunity for maintaining stability in perpetuity, given power is always in flux; rising powers will seek to assert themselves within and beyond the existing institutions and reshape them (or create parallel institutions) in ways that benefit them.

While major IR theories such as realism, liberalism and constructivism vary in terms of what power fluctuation means and leads to, they all agree that changes in relative levels of power, particularly China's rise, will lead to notable and significant changes in the international system – and this is being borne out clearly by the recent evidence of China's behavior and the counter-reactions it is generating.[36] In short, as the economic and

[35] Whereas neoliberals hold that there exists a strong relation between institutions and peace. Proponents of neoliberal institutionalism differentiate between the balance of power and prevailing international institutions. This differentiation can either initiate quick reform or cause replacement of existing international institutions. For instance, Mearsheimer quotes President Bill Clinton, "in a world where freedom, not tyranny, is on the march, the cynical calculus of pure power politics simply does not compute. It is ill-suited to a new era." Like neoliberal internationalism, constructivists suggest that the impacts of shifts of the international distribution of power mainly depend on what extent great powers support, approve or resist the growth of any new international norms. John J. Mearsheimer, *The Tragedy of Great Power Politics* (New York: W.W. Norton, 2001), 10; Kenneth N. Waltz, *Theory of International Politics* (New York: McGraw Hill Inc., 1979); John J. Mearsheimer, "The False Promise of International Institutions, *International Security*," Vol. 19, No. 3, (1994), 5-49; *Arthur A. Stein*, "Neoliberal Institutionalism" in C. Reus-Smit and D. Snidal (eds.), *The Oxford Handbook of International Relations* (London: Oxford University Press, 2008), 215; Richard Price, "Reversing the Gun Sights: Transnational Civil Society Targets Land Mines," *International Organization* Vol. 52, No.3, (1998) 613–644

[36] Samuel Huntington, *Clash of Civilizations and the Remaking of World Order*. (New York, NY: Simon & Schuster, 1996); Herbet Yee and Ian Storey, (.eds) *The China Threat: Perceptions, Myths and Reality*. (London, United Kingdom: Routledge Curzon, 2002); John Mearsheimer, "China's Unpeaceful Rise." *Current History*, Vol. 105, Issue. 690, (April 2006), 160-162; Emma V. Broomfield, "Perceptions of Danger: The China Threat Theory," *Journal of Contemporary China*, Vol. 12, No. 35, (2006), 265-284; Denny Roy, "The "China Threat" Issue: Major Arguments," *Asian Survey*, Vol. 36, No. 8, (1996), 758-771; Gerald C. Brown, "Understanding the Risks and Realities of China's Nuclear Forces," *Arms Control Association*, June 2021, accessed July 27, 2021, https://www.armscontrol.org/act/2021-06/features/understanding-risks-realities-chinas-nuclear-forces; "How a Rising China has Remade Global Politics," *World Politics Review*, May 12, 2021, accessed July 27, 2021, https://www.worldpoliticsreview.com/insights/27828/how-a-rising-china-has-remade-global-politics; Jeffrey Lewis, "China is Radically Expanding Its Nuclear Missile Silos," *Foreign Policy*, June 30, 2021, accessed July 26, 2021, https://foreignpolicy.com/2021/06/30/china-nuclear-weapons-silos-arms-control/; "China could soon have latest nuclear weapons, says US diplomat," *DW News*, July 8, 2021, accessed July 26, 2021, https://www.dw.com/en/china-could-soon-have-latest-nuclear-weapons-says-us-diplomat/a-58210816; Eric Heginbotham, Michael S. Chase, Jacob L. Heim, Bonny Lin, Mark R. Cozad, Lyle J. Morris,

military power of China continues to rise, a new pole to the international system is emerging. As such, China is now considered an "emerging potential superpower" according to William Wohlforth and Stephen Brooks.[37] Some even claim the system is increasingly bipolar.[38] China's economic and military power lies at the heart of its national power; the more its national power grows, the more power it can utilize to try to secure and pursue its interests at the international level. Therefore, as the international distribution of power changes, there will be broad and long-lasting consequences for international politics. Indeed, the recent COVID-19 pandemic has actually accelerated the shift in economic power towards China, with multiple economic forecasters bringing forward their estimates for when they expect the size of China's economy to overtake that of the US (by the end of 2029, 3¾ years faster than if there had been no pandemic).[39]

It is expected that due to the changes in the international distribution of power that have taken place in recent decades (see Tables 13-15 pp 266-268 displaying the comparison of the US and Chinese power), and that can be anticipated to continue, there will be challenges to long-standing prevailing international institutions and non-proliferation and arms control regimes.[40] These may include the Nuclear Non-Proliferation Treaty (NPT), the Nuclear Suppliers Group (NSG), of which China is a member, the Australia Group (AG), Wassenaar Arrangement (WA), and Missile Technology Control Regime (MTCR), of which China is not a member. Most of these institutions were established during an era

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Christopher P. Twomey, Forrest E. Morgan, Michael Nixon, Cristina L. Garafola, Samuel K. Berkowitz, *China's Evolving Nuclear Deterrent Major Drivers and Issues for the United States*, (Santa Monica, California: RAND Corporation, 2017), 1-160

[37] Stephen G. Brooks, and William C. Wohlforth "The Rise and Fall of the Great Powers in the Twenty-first Century: China's Rise and the Fate of America's Global Position," *International Security*, Vol. 40, No. 3, (2016), 7-53

[38] Cliff Kupchan, "Bipolarity is Back: Why It Matters," *The Washington Quarterly*, Vol. 44, No. 4 (2021), 123-139

[39] Malcolm Scott and Cedric Sam, "Here's How Fast China's Economy Is Catching Up to the U.S.," *Bloomberg*, May 12, 2016, updated: June 25, 2020, accessed November 11, 2021, https://www.bloomberg.com/graphics/2016-us-vs-china-economy/; Graham Robinson, Jeremy Leonard, and Toby Whittington, "Future of Construction: A Global Forecast for Construction to 2030," *Oxford Economics*, September 2021, accessed November 11, 2021, https://resources.oxfordeconomics.com/hubfs/Future%20of%20Construction_Full%20Report_FINAL.pdf; The Wall Street Journal – China Still Grew and Fueled Its Rise as Covid-19 Shook the Global Economy, *Centre for Economics and Business Research (CEBR)* January 18, 2021, accessed November 11, 2021, https://cebr.com/reports/the-wall-street-journal-china-still-grew-and-fueled-its-rise-as-covid-19-shook-the-global-economy/

[40] Bonnie S. Glaser, Matthew P. Funaiole and Brian Hart, Understanding China's 2021 Defense Budget, March 5, 2021, accessed April 29, 2021, https://www.csis.org/analysis/understanding-chinas-2021-defense-budget#:~:text=Spending%20on%20the%20military%20as,the%20highest%20in%20several%20years.&text=These%20figures%20confirm%20that%20China's%20leaders%20continue%20to%20prioritize%20military%20modernization.

of bipolarity and have been sustained under the recent period of US unipolarity. Moreover, the cancellation of the Intermediate-Range Nuclear Force Treaty (INF) and China's official refusal to enter into strategic arms reduction talks with the US are the types of emerging challenges from China to the international arms control regime. Thus, China could seek to alter or ignore them as its power grows. Challenges are evident already in other organizations, as demands from China for reforms to international institutions, such as the United Nations Security Council (UNSC) and the International Monetary Fund (IMF), have occurred.[41] China's dissatisfaction with the lack of institutional change may have led it to create the Asian Infrastructure Investment Bank (AIIB), an institution that runs parallel to the Asian Development Bank (ADB) and is an alternative to the US-led World Bank (WB).[42] Likewise, China has several concerns over the fissile material cut-off treaty (FMCT) regarding the existing stockpiles of states like the US. China also views the US-India civil nuclear deal with suspicion, letting India acquire uranium without IAEA safeguards. The US, UK, and Australia security pact, (the AUKUS alliance formed in September 2021) has its own proliferation risks as well. Previously, China (and Russia) insisted in the Conference of Disarmament (CD) that progress on the FMCT be linked to arms control measures on the agenda of CD, such as preventing an arms race in outer space (PAROS).[43] As the CD operates by consensus, this stance from China and Russia, and the US unwillingness to compromise, stalled efforts to begin FMCT negotiations.[44]

China's Rise to Global Prominence

China's rise since the end of the Cold War has been facilitated by America's strategic mistakes. The 9/11 terrorist attacks against the US provide a potent reference point for considering this. Prior to 9/11, the US and China relationship had been strained for reasons such as China's record on human rights, and nuclear and missile proliferation, the Taiwan Strait Crisis in 1995, and the US accidental bombing of the Chinese embassy

[41] J. Mohan Malik, "Security Council Reform: China Signals Its Veto," *World Policy Journal*, Vol. 22, No. 1, (2005), 19-29; Jue Wang, "China-IMF Collaboration: Toward the Leadership in Global Monetary Governance," *Chinese Political Science Review*, Vol. 3, Issue 1, (2018) 62-80

[42] Yun Sun, "China's AIIB Challenge," *Stimson*, March 11, 2015, accessed March 25, 2021, https://www.stimson.org/2015/china-aiib-challenges/

[43] Bates Gill, "China and Nuclear Arms Control: Current Positions and Future Policies," *SIPRI Insights on Peace and Security*, No. 2010/4 https://www.sipri.org/sites/default/files/files/insight/SIPRIInsight1004.pdf; Li, Bin, *"China," Banning the Production of Fissile Materials for Nuclear Weapons: Country Perspectives on the Challenges to a Fissile Material (Cutoff) Treaty* (International Panel on Fissile Materials: Princeton, NJ, 2008), 8;

[44] Daryl Kimball, "Fissile Material Cut-off Treaty (FMCT) at a Glance," *Arms Control Association*, June 2018, accessed July 1, 2021, https://www.armscontrol.org/factsheets/fmct

in Belgrade in 1999.[45] The US engagements in the global 'war on terror', especially its projection of military power and subsequent occupation of Afghanistan and Iraq, was indicative of a strategic shift in US grand strategy towards the Middle East. As a result, it largely ignored Asia and China's rise and was unable to do much to shape how China rose. The US became trapped in "imperial overstretch" in Afghanistan and Iraq, while China was able to largely avoid (through massive domestic spending) the negative economic consequences of the global financial crisis of 2008 – consequences the US was unable to avoid.[46] China, with decades of unprecedented growth, maintained an average of 9.18% growth in its annual Gross Domestic Product (GDP) from 1989 to 2021.[47] As a consequence, Anatol Lieven confidently declared in 2011 that "the clear victor of the global war on terror [and GFC] appears to be China."[48]

Often strong economies give birth to an increasingly powerful military. With the rise of China's economy, large-scale military force modernization has taken place. According to the World Bank, China's Gross Domestic Product (GDP) was USD 383.4 billion (hereafter $) in 1991, and its defense budget, according to the Stockholm International Peace Research Institute (SIPRI) database, was $23.3 billion.[49] By 2021, its GDP had

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[45] Richard C. Bush, "30 years after Tiananmen Square: A look back on Congress' forceful response," *Brookings*, May 29, 2019, accessed August 1, 2021, https://www.brookings.edu/blog/order-from-chaos/2019/05/29/30-years-after-tiananmen-square-a-look-back-on-congress-forceful-response/; Kristin Archick, Richard F. Grimmett and Shirley Kan, "European Union's Arms Embargo on China: Implications and Options for U.S. Policy," *CRS*, April 15, 2005, accessed August 1, 2021, https://www.everycrsreport.com/files/20050415_RL32870_91cfea05d1076d12c778cd91a6c080bcbf9c3e25.pdf; Chen Qimao, "The Taiwan Strait Crisis: Its Crux and Solutions," *Asian Survey*, Vol. 36, No. 11 (1996), 1055-1066; Peter Hays Gries, "Tears of Rage: Chinese Nationalist Reactions to the Belgrade Embassy Bombing," *The China Journal* No. 46 (Jul., 2001), 25-43; Dexin Tian, "U.S. and NATO Apologies for the Chinese Embassy Bombing: A Categorical Analysis," *International Journal of Communication*, No. 1 (2007), 360-376; "The Gulf War-Lessons for Chinese Military S&T: A report from U.S. Embassy Beijing November 1996," *FAS*, accessed February 4, 2021, https://fas.org/nuke/guide/china/doctrine/stmil14.htm

[46] Aaron L. Friedberg, "Implications of the Financial Crisis for the US-China Rivalry," *Survival*, Vol. 52, No 4, (2010), 31-54; Wayne M. Morrison, "China and the Global Financial Crisis: Implications for the United States," *CRS Report*, June 3, 2009, accessed November 29. 2021, https://sgp.fas.org/crs/row/RS22984.pdf; Eswar Prasad, "The Effect of the Crisis on the U.S.-China Economic Relationship," *Brookings*, February 17, 2009, accessed November 11, 2021, https://www.brookings.edu/testimonies/the-effect-of-the-crisis-on-the-u-s-china-economic-relationship/

[47] "China GDP Annual Growth Rate," *Trading Economics*, accessed April 6, 2022, https://tradingeconomics.com/china/gdp-growth-annual; "China's Economic Rise: History, Trends, Challenges, and Implications for the United States," *Congressional Research Service*, Updated June 25, 2019, accessed March 25, 2021, https://fas.org/sgp/crs/row/RL33534.pdf

[48] Anatol Lieven, "China the Quiet Winner in War on Terror," *The Australian*, August 29, 2011, quoted in Marc Koehler, "The Effects of 9/11 on China's Strategic Environment Illusive Gains and Tangible Setback," *Joint Force Quarterly*, Issue 68, 1st Quarter. Bracketed text in the quote is inserted by the PhD author.

[49] Military expenditure (% of GDP) – China, The *World Bank*, accessed January 14, 2021, https://data.worldbank.org/indicator/MS.MIL.XPND.GD.ZS?locations=CN; China, The *World Bank*, accessed January 14, 2021, https://data.worldbank.org/country/china; "Military expenditure by country, in constant" (2019) US$ m., 1988-2020 © *SIPRI 2021*, accessed November 29, 2021,

increased to $18 trillion, and its defense budget was $252 billion.[50] As a result, China is now the second-largest economic and military power in the world.

Table 1. China vs. US GDP and Defense Budget 1991-2021[51]

Country	GDP in 1991 (USD trillions)	Defense budget in 1991 (USD billions)	GDP in 2021 (USD trillions)	Defense budget in 2021 in (USD billions)
US	6.158	551.900	23.00	778.23
China	0.383	23.300	18.00	252.00
Japan	3.584	43.769	5.20	49.14
Germany	1.869	56.829	4.22	52.76
France	1.269	51.730	2.69	52.74

Economic growth is one of the main factors that has allowed military modernization and change in the defense policy of China. This modernization started after the 1991 Gulf War, when China observed the display of the US' extraordinary military capabilities that led to victory over Iraq's army in just six weeks.[52] During the 1995 Cross-Strait Crisis, China felt vulnerable to US military capabilities displayed in the 1991 Gulf War and started general military modernization.[53] Since 1991, there have been two waves of military modernization in China. The *first wave* of modernization started after the 1995 Cross-Strait Crisis and lasted until 2012. With the arrival of President Xi to power in 2012 came *the second* wave of military modernization, which is more comprehensive and ambitious than the previous wave, with a special focus on nuclear force modernization. Military modernization is part of national reforms based on Xi's '*China Dream*', a vision to restore China's lost great power status by making the PLA a "world-class force" which

https://sipri.org/sites/default/files/Data%20for%20all%20countries%20from%201988%E2%80%932020%20in%20constant%20%282019%29%20USD%20%28pdf%29.pdf

[50] Ibid

[51] Ibid.; France GDP, *Trading Economics*, accessed April 7, 2022, https://tradingeconomics.com/france/gdp#:~:text=GDP%20in%20France%20is%20expected,according%20to%20our%20econometric%20models.; Germany Full Year GDP Growth, *Trading Economics*, accessed April 7, 2022, https://tradingeconomics.com/germany/full-year-gdp-growth; Japan GDP, *Trading Economics*, accessed April 7, 2022, https://tradingeconomics.com/japan/gdp#:~:text=GDP%20in%20Japan%20is%20expected,according%20to%20our%20econometric%20models.; GDP (current US$) - France, Japan, China, United States, Germany, *The World* Bank, accessed November 29, 2021, https://data.worldbank.org/indicator/NY.GDP.MKTP.CD?locations=FR-JP-CN-US-DE

[52] Lawrence Freedman and Efraim Karsh, Gulf Conflict 1990-1991: *Diplomacy and War in the New World Order* (Princeton, N.J. : Princeton University Press, 1994), 85-94, 312-330, 409; Alastair Finlan, *The Gulf War 1991* (New York: Routledge, 2003), 29-67

[53] Lindsay Maizland, "China's Modernizing Military," CFR, Updated February 5, 2020, accessed March 25, 2021, https://www.cfr.org/backgrounder/chinas-modernizing-military

can "fight and win" global wars by 2049.[54] Nuclear weapons force modernization is a central cog in the ongoing military modernization of China, which has profound implications for China's nuclear weapons policy as well as for regional and international security and strategic stability, issues discussed in Chapters Six, Seven, and Eight.

Contemporary Debate over China's Nuclear Weapons Program

A significant development in the second wave of modernization occurred when, on December 31, 2015, the PLA Second Artillery Force (responsible for China's nuclear weapons) was reorganized and renamed the PLA Rocket Force (PLARF), and the new PLA Strategic Support Force (PLASSF) was introduced to deal with space-related missions.[55] During the launching ceremony, President Xi stated that,

> PLA Rocket Force (PLARF) should strengthen… nuclear deterrence and nuclear counter-attack capabilities, intensify the construction of medium and long-range precision strike power… so as to build a powerful and modern Rocket Force.[56]

The PLARF is now equal to any other tier of the Chinese military, the Army, Navy, and Air Force.[57] These structural changes in China's nuclear program have generated a debate over China's evolving nuclear doctrine among scholars of IR and nuclear studies in the West and elsewhere.[58] The new organizational changes in the PLARF herald further changes as China moves towards developing sea-based nuclear platforms.[59] To integrate

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[54] Xi Jinping, "Secure a Decisive Victory in Building a Moderately Prosperous Society in All Respects and Strive for the Great Success of Socialism with Chinese Characteristics for a New Era," Delivered at the *19th National Congress of the Communist Party of China, October 18, 2017*, accessed March 25, 2021, http://www.xinhuanet.com/english/download/Xi_Jinping's_report_at_19th_CPC_National_Congress.pdf; Maizland, "China's Modernizing Military"

[55] China establishes Rocket Force and Strategic Support Force, accessed February 2, 2016, http://eng.mod.gov.cn/ArmedForces/second.htm; also see Kevin L. Pollpeter, Michael S. Chase, and Eric Heginbotham, *The Creation of the PLA Strategic Support Force and its Implications for Chinese Military Space Operations* (Santa Monica: RAND, 2017), 13-14

[56] Ibid.

[57] Zhang Hui, "New PLA Rocket Force conducts desert, forest drills," *Global Times*, January 5, 2016, accessed February 2, 2016, http://www.globaltimes.cn/content/961840.shtml

[58] Fiona S. Cunningham and M. Taylor Fravel, "Assuring Assured Retaliation: China's Nuclear Posture and U.S.-China Strategic Stability," *International Security*, Vol. 40, No. 2, (2015), 7-50

[59] Liping Xia, "China's Nuclear Doctrine: Debates and Evolution," *Carnegie Endowment for International Peace*, June 30, 2016, https://carnegieendowment.org/2016/06/30/china-s-nuclear-doctrine-debates-and-evolution-pub-63967; Li Bin, "Identifying China's Nuclear Strategy," *World Economics and Politics*, no. 9 (2006): 16–22; James Mulvenon, "Chinese and Mutually Assured Destruction: Is China Getting MAD?" in *Getting MAD: Nuclear Mutual Assured Destruction, Its Origins and Practice*, ed. Henry D. Sokolski (Carlisle, PA: Strategic Studies Institute (SSI) of the U.S. Army War College, November 2004); Hui Zhang, "China's Nuclear Weapons Modernization: Intentions, Drivers, and Trends," *Belfer Center for Science and International Affairs*, July 15, 2012, accessed December 2018,

all three legs of China's nuclear triad (that is, nuclear weapons based on land, at sea and in aerial assets) and the increasing numbers of intercontinental ballistic missiles (ICBMs), the PLARF needs to develop more sophisticated command and control systems to address issues over the delegation of power and introduce processes that safeguard the integrity of nuclear release authority for a larger, more dispersed force.[60] There are also discussions on China's NFU, as some believe China may give up this long-standing nuclear strategy.[61] A detailed discussion on all these and other issues related to China's emerging nuclear weapons policy and force modernization is carried out in subsequent chapters, as detailed below.

Central Argument

The thesis concludes that China's ongoing nuclear weapons policy and force modernization are driven by both structural imperatives and internal dynamics. In making a novel contribution to the literature, it finds that although the structural imperatives appear to be the primary causal factors driving developments in recent years, internal factors, such as leadership policies, economic resources and technological capabilities, and organizational or bureaucratic policies have interacted with external factors and induced change, and collectively have triggered the emergence of a comprehensive nuclear weapons policy and force modernization. Such a comprehensive modernization reflects China's ambitions to secure *full-spectrum deterrence*, strengthening China's great power status.

The consequences of this modernization are very significant for both regional and international deterrence and strategic stability, as they are generating a nuclear security multilemma; a condition involving more than two nuclear states in an overlapping security situation.[62] In turn, the US efforts to counter China, which began in 2011, during the first tenure of the Obama administration in the shape of the US rebalancing strategy

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http://belfercenter.ksg.harvard.edu/publication/22292/chinas_nuclear_weapons_modernization.html?breadcrumb=%2Fexperts%2F13%2Fhui_zhang.

[60] Ibid

[61] Keir A. Lieber and Daryl G. Press, "The End of MAD? The Nuclear Dimension of U.S. Primacy," *International Security*, Vol. 30, No. 4 (Spring 2006), 10; Brendan Rittenhouse Green and Austin Long, "Stalking the Secure Second Strike: Intelligence, Counterforce, and Nuclear Strategy," *Journal of Strategic Studies*, Vol. 38, Nos. 1–2 (February 2015), 69; Zachary Keck, "The Big China Nuclear Threat No One Is Talking About," *The National Interest*, June 2, 2017, accessed March 18, 2018, http://nationalinterest.org/blog/the-buzz/the-big-china-nuclear-threat-no-one-talking-about-20983

[62] Peter Hayes and Chung-in Moon, "The North Korean Nuclear Multilemma: Options to Break the Nuclear Deadlock in Northeast Asia," *Korea Observer*, Vol. 47, No. 4 (Winter 2016), 699-719

or pivoting to Asia, accelerated dramatically under the Trump administration.[63] This is evidenced through the 2018 US Nuclear Posture Review (NPR), a highly significant document that is critically examined in this research as it explains the rationale for the US nuclear strategy, doctrine, and forces, which introduces new nuclear-related capabilities to counter China's Anti-Access and Area-Denial (A2/AD) forces.[64] A2/AD is a military strategy where anti-access is aimed at denying the adversary's military access to areas of operations, and area denial is aimed at denying the adversary's military freedom of operation in the area under control.[65] For China, its A2/AD is focused on the Western Pacific and seeks to deny external, especially US military, access to China's immediate naval regions, to Taiwan, the East and South China Seas. It is plausible that China will seek to push this perimeter further outwards as its naval power, A2/AD capabilities, and nuclear weapons program advance.

At the regional level, the US is trying to keep its security architecture in Asia coherent and robust by reifying and deepening ties with allies such as Japan and South Korea. The US is also engaging other allies, such as Australia, and strengthening ties with India in the Indo-Pacific region, of which the Quadrilateral Security Dialogue (QUAD) is the primary example (this includes the US, Japan, Australia, and India).[66] Regional states such as Japan, South Korea, and India are also aware of emerging threats emanating from China and taking their own independent measures. For instance, Japan is building a pre-emptive strike capability and looks set to expand its military budget in coming years and

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[63] Kenneth G. Lieberthal, "The American Pivot to Asia," *Brookings*, December 21, 2011, accessed February 25, 2021, https://www.brookings.edu/articles/the-american-pivot-to-asia/; Janine Davidson, "The U.S. 'Pivot to Asia'" *American Journal of Chinese Studies*, Vol. 21, Special Issue (2014), 77-82; Tala Batangan, "Biden's Pivot to Asia amid China's Expanding Influence," *The Reality of Aid Work*, May 24, 2021, accessed June 22, 2021, https://realityofaid.org/bidens-pivot-to-asia/; Van Jackson, "America's Asia Strategy has reached a Dead End," *Foreign Policy*, January 9, 2022, accessed January 23, 2022, https://foreignpolicy.com/2022/01/09/us-southeast-asia-china-biden-economic-strategy-geopolitics/

[64] Office of the Secretary of Defense, "Nuclear Posture Review 2018," accessed March 20, 2019, https://media.defense.gov/2018/Feb/02/2001872886/-1/-1/1/2018-NUCLEAR-POSTURE-REVIEW-FINAL-REPORT.PDF

[65] Krepinevich, Andrew, Barry Watts and Robert Work, *Meeting the Anti-Access and Area-Denial Challenge* (Washington, D.C., Center for Strategic and Budgetary Assessments, 2013), 1-93

[66] H. D. P. Envall, "The Quadrilateral Security Dialogue: Towards an Indo-Pacific Order?" *S. Rajaratnam School of International Studies*, Policy Report, September 2019, accessed November 16, 2019, https://www.rsis.edu.sg/wp-content/uploads/2019/09/PR190909_The-Quadrilateral-Security-Dialogue.pdf; Jeff M. Smith, "The QUAD 2.0: A Foundation for a Free and Open Indo–Pacific," *The Heritage Foundation*, July 6, 2020, August 1, 2020, https://www.heritage.org/sites/default/files/2020-07/BG3481.pdf; Lavina Lee, "Assessing The QUAD: Prospects and Limitations of Quadrilateral Cooperation for Advancing Australia's Interests", *Lowy Institute*, May 19, 2020, accessed June 13, 2020, https://www.lowyinstitute.org/publications/assessing-quad-prospects-and-limitations-quadrilateral-cooperation-advancing-australia; Sheila A. Smith, "The QUAD in the Indo-Pacific: What to Know," *Council on Foreign Relations (*here onwards *CFR)* May 27, 2021, accessed June 12, 2021, https://www.cfr.org/in-brief/quad-indo-pacific-what-know

continue to strip away the self-imposed constraints in its post-WWII constitution, South Korea is building a national missile defense system, and India is building its SSBNs force and participating in allied military exercises in the Indo-Pacific region.[67]

Chapter Outline

Chapter One outlines the conceptual and theoretical framework of analysis that is utilized throughout subsequent chapters. This chapter examines two main theoretical paradigms. Firstly, it examines the central theoretical assumptions of neoclassical realism, its fundamental postulates, how it tends to explain state behavior and politics among states, and why it predicts international outcomes in a certain way.[68] Secondly, it examines deterrence theory, the different *waves* of deterrence theory as it evolved, and how nuclear deterrence was understood during the Cold War and post-Cold War periods. It also examines the western and Chinese understanding of deterrence theory.[69] Some other important auxiliary frameworks and concepts, such as crisis stability, structural stability, crisis escalation, and extended deterrence are explained towards the end of the chapter.

Chapter Two examines the historical evolution of China's nuclear weapons program and doctrine. It is divided into two parts. Part I covers the early history of the evolution and

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[67] Titli Basu, "Will Japan Pursue a Strike Capability in Lieu of Aegis Ashore?" *The Diplomat*, July 28, 2020, accessed February 25, 2021, https://thediplomat.com/2020/07/will-japan-pursue-a-strike-capability-in-lieu-of-aegis-ashore/; Jeffrey W. Hornung, "Is Japan's Interest in Strike Capabilities a Good Idea?" *War on the Rocks*, July 17, 2020, accessed October 25, 2020, https://warontherocks.com/2020/07/is-japans-interest-in-strike-capabilities-a-good-idea/; also see Tim Kelly, "Japan to consider strike capability to replace missile defense system," *Reuters*, June 25, 2020, https://www.reuters.com/article/us-japan-defense-kono/japan-to-consider-strike-capability-to-replace-missile-defense-system-idUSKBN23W10Y; Kingston Reif, "U.S. and Allied Ballistic Missile Defenses in the Asia-Pacific Region," *Arms Control Association*, January 2019, accessed March 4, 2021, https://www.armscontrol.org/factsheets/us-allied-ballistic-missile-defenses-asia-pacific-region; Sandeep Unnithan, "India's Nuclear Sharks," *India Today*, Updated; April 23, 2021, accessed February 18, 2022, https://www.indiatoday.in/magazine/defence/story/20210426-india-s-nuclear-sharks-1791817-2021-04-17; Zia Mian, M.V. Raman, and A.H. Nayyar, "Nuclear Submarines in South Asia: New Risks and Dangers," *Journal for Peace and Nuclear Disarmament*, Vol. 2, No. 1 (2019), 184-202; Aqeel Akhtar, "Nuclear submarines shift strategic balance of Indian Ocean," *IISS*, January 29, 2019, accessed March 10, 2021, https://www.iiss.org/blogs/analysis/2019/01/nuclear-submarines-indian-ocean

[68] Gideon Rose, "Review: Neoclassical Realism and Theories of Foreign Policy," *World Politics*, Vol. 51, No. 1, (1998), 144-172; Brian Rathbun, "A Rose by Any Other Name: Neoclassical Realism as the Logical and Necessary Extension of Structural Realism," *Security Studies* 17, (2008), 294-321; Jeffrey W. Taliaferro, "Security Seeking under Anarchy: Defensive Realism Revisited," *International Security*, Vol. 25, No. 3, (2000-2001), 128-161; William C. Wohlforth, "The Stability of a Unipolar World," *International* Security, Vol. 24, No. 1, (Summer 1999), 5-41

[69] Unlike Chinese international relations theory, much Chinese thinking/literature on nuclear deterrence is available. *PLA Encyclopaedia Committee, Chinese Military Encyclopaedia, Supplemental Volume* (Beijing, PRC: Academy of Military Science Publishing House, 2002), 477; Zhou Peng and Wen Enbing, "Developing the Theory of Strategic Deterrence with Chinese Characteristics," *China Military Science* No. 3, (2004) 20; *Academy of Military Sciences Military Strategy Research Office (PRC), The Science of Military Strategy* (Beijing, PRC: Military Science Publishing House, 2013), 147.

development of China's nuclear weapons program, which started in 1949 and ended when China tested its nuclear weapons in 1964. It also examines how during the early decades of the Cold War, China's nuclear threat perception was shaped in such a way that Chairman Mao Zedong began to call nuclear weapons a 'paper tiger'.[70] What the role of the US was in shaping China's strategic environment, and how the latter managed to acquire nuclear technology for building the nuclear bomb, is addressed.

Part II examines China's nuclear weapons program and doctrinal developments from 1964, immediately after China tested its first nuclear weapons, until 2000. (China's nuclear weapons force modernization in the twenty first century is covered in Chapter Five.) It explores the reasons for seemingly slow progress in China's nuclear weapons force development, despite having a security-driven nuclear weapons program. Part II identifies and considers different reasons for China's slow development of its nuclear programs, such as lack of the required technological base, financial and material constraints, the decline in nuclear threat perception, and the leadership's preference for traditional warfighting approaches.

Chapters Three and Four explores the historical and contemporary drivers of ongoing change in China's nuclear weapons force and policy, which dates back to the independence of Communist China. The theoretical framework of neoclassical realism identifies two broad categories of drivers: *structural imperatives* and *internal drivers*. The structural imperatives, considered in Chapter Three, involve factors associated with the anarchic structure of the international system, such as the material capabilities of China's adversaries, primarily the US. Bilateral or multilateral alliances are also part of structural connections, such as the US bilateral alliances with Japan and South Korea, relations with Taiwan, and the QUAD involving the US, India, Australia and Japan.[71] Chapter Four examines the internal drivers of China's nuclear weapons force modernization. This includes the role of China's leadership, availability of financial and technological

[70] Anna L. Strong, *Dawn comes up like Thunder out of China; An Intimate Account of the Liberated Areas in China*, (Bombay, People's Publishing House, 1948), 55; Mao Zedong, "A Conversation With American Journalist Anna Louise Strong," in *Selected Works of Mao Zedong*, vol. 4 (Beijing: People's Publishing House, 1991), 1194-95

[71] Saheli Roy Choudhury, "The QUAD countries pledge to promote an Indo-Pacific region that is 'undaunted by coercion'," *CNBC*, September 27, 2021, accessed December 1, 2021, https://www.cnbc.com/2021/09/27/quad-leaders-summit-us-india-japan-australia-statement-on-indo-pacific.html; Miya Tanaka, "Japan to host 'QUAD' meeting with U.S., Australia, India next year," *The Japan Times*, November 20, 2021, accessed December 1, 2021, https://www.japantimes.co.jp/news/2021/11/20/national/politics-diplomacy/japan-quad-china-us/

resources, and organizational or bureaucratic factors. Together, these chapters examine the beginning of the first wave of China's nuclear force modernization.

Chapter Five examines China's contemporary nuclear weapons force modernization since 2000, notably after 2015 publically announced nuclear force modernization.[72] This period covers almost a decade of the first wave of modernization that ended in 2012 and the entire second wave of China's nuclear modernization, which started with President Xi and is still occurring. The chapter is divided into two parts. The first investigates ongoing changes in China's nuclear weapons use policy, and the second studies the material developments in China's nuclear weapons force. While doing this, the chapter explores the reason(s) for China's possible abandonment of its long-standing NFU policy and other technical and doctrinal issues associated with China's nuclear weapons force modernization, such as launch-on-warning posture, the delegation of power in the case of China's existing and emerging fleet of ballistic missile submarine (SSBN), and the changes it may herald in the nuclear control, and command and control system of China.

Chapter Six critically evaluates the implications of China's evolving nuclear weapons force modernization for international security, focusing on its implications for the US. The chapter examines how the US nuclear weapons force and policy are impacted by China's comprehensive nuclear force modernization. This includes the US' 2018 Nuclear Posture Review (NPR) and how a tit-for-tat reaction between China and the US exacerbates the security dilemma between them and negatively impacts strategic stability between both states.[73]

Chapters Seven and Eight adopt a regional perspective, examining the implications of China's nuclear weapons force modernization for Beijing's proximate region. To consider this, case studies examine Taiwan, Japan, South Korea, and India. Chapter Seven examines the implications for Japan and South Korea. Both states are treaty-bound allies of the US and have US extended nuclear deterrence guarantees, reflecting that any military conflict between China and these states would likely involve the US and that it

[72] China Power Team, "How is China Modernizing its Nuclear Forces?" *China Power*, December 10, 2019. Updated October 28, 2020, accessed December 1, 2021. https://chinapower.csis.org/china-nuclear-weapons/; Fiona S. Cunningham and M. Taylor Fravel, "Assuring Assured Retaliation: China's Nuclear Posture and U.S.-China Strategic Stability," *International Security*, Vol. 40, No. 2, (2015), 7-50; Hui Zhang, China chapter "China's nuclear force modernisation," in Allison Pytlak and Ray Acheson eds. *Assuring Destruction Forever: 2020 Edition* (New York: Reaching Critical Will, 2020), 27-37

[73] Office of the Secretary of Defense, "Nuclear Posture Review February 2018," accessed December 1, 2021, https://media.defense.gov/2018/Feb/02/2001872886/-1/-1/1/2018-NUCLEAR-POSTURE-REVIEW-FINAL-REPORT.PDF

could involve nuclear weapons. However, there is also a fear of entrapment by Japan and South Korea in their alliance with the US, therefore both states are running parallel defense strategies, such as South Korea's indigenous air and missile defense program, and Japan, despite maintaining eight Aegis BMD-equipped destroyers in cooperation with the US, has given up the Aegis Ashore BMD system, replacing it with an intention to develop an indigenous precision strike capability.[74] Amidst these developments, it is important to explore the regional implications for these states of China's nuclear program, as their efforts to overcome threats generate a security dilemma, leading to strategic instability and an evolving arms race in the region.

Chapter Eight examines the implications of China's nuclear force modernization for India and Taiwan. These case studies reveal more about the Indo-Pacific security environment and nuclear politics, given India is a nuclear power, and Taiwan has informal security commitments with the US, but, unlike Japan and South Korea, it does not have an extended nuclear deterrence guarantee from Washington. Border tensions with India are already mounting, leading to sporadic border skirmishers and the death of soldiers on both sides in July 2020.[75] Soon after this border skirmish, India responded with as many as ten missile tests, signaling its power in the nuclear realm and potential intent to use nuclear arms if necessary.[76] In addition, competition is unfolding between India and China, particularly related to SSBN platforms, generating a nuclear security dilemma. Taiwan is also an interesting case study because it showcases the level of commitment of the US to a pivotal state in the emerging US-China great power competition, given Beijing claims Taiwan must eventually be reunified (peacefully or via force) with the mainland.[77]

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[74] "Navy Aegis Ballistic Missile Defense (BMD) Program: Background and Issues for Congress," *Congressional Research Service* (*CRS* hereafter), Updated October 20, 2021, accessed December 1, 2021, https://sgp.fas.org/crs/weapons/RL33745.pdf

[75] "China reveals four soldiers killed in June 2020 border clash with India," *Reuters*, February 19, 2021, accessed December 1, 2021, https://www.reuters.com/article/us-china-india-border-idUSKBN2AJ04B "China admits it lost four soldiers in 2020 India border clash," *Aljazeera*, February 19, 2021, accessed December 1, 2021, https://www.aljazeera.com/news/2021/2/19/china-admits-it-lost-four-soldiers-in-2020-india-border-clash

[76] "India test-fires 10 missiles in 35 days. It is not a coincidence," *The Hindustan Times*, October 29, 2020, accessed December 1, 2021, https://www.hindustantimes.com/india-news/india-races-to-upgrade-its-armoury-fires-a-missile-every-4-days/story-UB5RQaMY4zVlTlYbNFR8EL.html

[77] "Our Relationship," *The American Institute in Taiwan*, accessed February 20, 2022, https://www.ait.org.tw/our-relationship/; Richard Bush, "The United States Security Partnership with Taiwan," *The Brookings Institution*, July 13, 2017, https://www.brookings.edu/wp-content/uploads/2016/11/fp_20160713_taiwan_alliance.pdf; "Breaking Down Assumptions about China's Taiwan Strategy," Stanford Freeman Spogli Institute for International Studies, *FSI News*, March 12, 2021, accessed February 21, 2022, https://fsi.stanford.edu/news/breaking-down-assumptions-about-chinas-taiwan-strategy-oriana-skylar-mastro-aspi; "Full text of Xi Jinping's report at 19th CPC National Congress,"

Soon after his inauguration, President Joe Biden also reaffirmed the US' security commitments to Taiwan.[78] Overall, the case studies in the chapters evaluate China's nuclear weapons force modernization, its impact on these states, and how countermeasures of these states are generating a spiral of security-insecurity paradox, leading to deterrence and strategic instability in the region, which increases the chance of nuclear conflict.

Using the framework of neoclassical realism, the research concludes that China's general military modernization and restructuring, particularly its nuclear weapons force modernization, is driven by both external and internal factors. The external factors are the primary, and the internal factors are secondary. The emerging nuclear force modernization suggests that China is on a trajectory of achieving full-spectrum deterrence. The underlying objectives of China's military modernization are to "effectively enhance our ability to *fight and win wars*, resolutely safeguard China's sovereignty, security, and development interests, and effectively fulfill the sacred missions and tasks the people's army has been entrusted in the new era."[79] These objectives are part of a drive to ensure legitimacy that flows from the President Xi's *China Dream* vision, a dream of building a "world-class force" that can "fight and win" global wars by 2049.[80]

China Daily, November 4, 2017, accessed February 21, 2022, https://www.chinadaily.com.cn/china/19thcpcnationalcongress/2017-11/04/content_34115212.htm

[78] Trevor Hunnicutt, "Biden says United States would come to Taiwan's defense," *Reuters*, October 23, 2021, accessed December 1, 2021, https://www.reuters.com/world/asia-pacific/biden-says-united-states-would-come-taiwans-defense-2021-10-22/

[79] Lt. Gen. He Lie, "China should effectively enhance ability to fight, win wars," *Global* Times, October 1, 2020, accessed February 23, 2021, https://www.globaltimes.cn/content/1202566.shtml

[80] Xi Jinping, "Secure a Decisive Victory in Building a Moderately Prosperous Society in All Respects and Strive for the Great Success of Socialism with Chinese Characteristics for a New Era" Delivered at the *19th National Congress of the Communist Party of China*, October 18, 2017, accessed February 24, 2021, http://www.xinhuanet.com/english/download/Xi_Jinping's_report_at_19th_CPC_National_Congress.pdf; Lindsay Maizland, "China's Modernizing Military," *CFR*, updated February 5, 2020, accessed February 24, 2021, https://www.cfr.org/backgrounder/chinas-modernizing-military

Chapter One

Theoretical Framework: Neoclassical Realism and Deterrence Theory

1.1 Introduction

Chapter One is divided into two parts that outline the theoretical framework for this research. Part one outlines neoclassical realism, which holds that domestic and structural factors are critical variables in explaining China's emerging nuclear policy. Part two focuses on the theory of nuclear deterrence, its salience, and the differences between the Chinese and the US/Western understanding of the theory. The chapter also sets out the concept of the security dilemma and how it evolved.

Part one focuses on the relationship of different neoclassical variables affecting the emerging nuclear policy of China. It also outlines realism as one of the main theories of international relations and how it has evolved over time, considers what the main differences among respective variants of the theory are, and explains why neoclassical realism will be more effective than other international relations theories to address the research questions central to this thesis. Subsequently, a comparative analysis is carried out between neorealism and neoclassical realism to explain further why neoclassical realism is most suitable for the proposed research. However, before this, obvious questions to ask are Why does this part not include any Chinese international relations theory? Why does it require Western international relations theory to explain China's conduct? After an extensive literature review of Chinese literature on international relations, the study could not find any coherent, unified Chinese international relations theory. Most Chinese scholars have used western international relations theories to comprehend Chinese international relations; therefore western international relations theory can serve the purpose of this research.[81]

[81] Wang Gungwu and Zheng Yongnian eds. *China and the New International Order*, (New York, Routeledge, 2008); Hongyi Lai, and Yiyi Lu, eds. *China's Soft Power and International Relations* (New York: Routeledge, 2012; Dean Cheng, "An Overview of Chinese thinking about Deterrence," in Frans Osinga and Tim Sweijs eds. *Deterrence in the 21st Century: Insights from Theory and Practice* (Hague, T.M.C. Asser Press, 2020) 177-200; Li Bin, "Chinese Thinking On Nuclear Weapons," *Arms Control Association*, December 2015, accessed April 30, 2021, https://www.armscontrol.org/act/2015-12/features/chinese-thinking-nuclear-weapons; Tong Zhao, *Tides of Change*, (Washington, D.C.: Carnegie Endowment for International Peace, 2018); Baohui Zhang, *China's Assertive Nuclear Posture State Security in an Anarchic International Order* (Routledge: New York, 2015); Fan Jishe, "Nuclear

Neoclassical realism is based on the understanding of international relations proposed by Gideon Rose and others, such as Thomas Christensen, Aaron Friedberg, Randall Schweller, Jack Snyder, William Wohlforth, and Fareed Zakaria.[82] Neoclassical realists analyze and explain international politics and foreign policy decision-making through a level of analysis approach of international relations, that is, by supplementing the structural level of analysis with domestic political factors. The latter primarily includes the economic resources of a state, domestic political/bureaucratical processes, and statesmen's perceptions and intentions of the relative distribution of power and the critical role of the head of state in influencing policy and capacity to achieve stated objectives.[83] The following section deals briefly with the introduction of the theoretical development of realism and its main variants.

1.2 Towards a Framework of Analysis

The road to theory has no end, and almost all international relations theories are subject to social inquiry and are contested. Thomas Kuhn, in *The Structure of Scientific Revolutions*, explains how and why some theories become validated and acknowledged widely.[84] He explained that when existing theories lose their explanatory power and new theories emerge and evolve, a "paradigm shift" takes place.[85]

According to Barry Buzan and Amitav Acharya, there are two definitions of theory in the literature on international relations: a softer reflectivist definition dominant in the West, and a harder positivist definition, prevalent in the US especially.[86] According to Buzan and Acharya, the former includes "anything that organizes study systematically… bring coherence to interrelated ideas and concepts,"[87] while the latter includes a "testable hypothesis of a causal nature."[88] In the Chinese context these two definitions of theory can be categorized into "*action-oriented definition* and *knowledge-oriented definition*" of

Nonproliferation: China's Thinking And Practices" in Li Bin and Tong Zhao eds. *Understanding Chinese Nuclear Thinking* (New York: CEIP, 2016), 193-218.

[82] Randall L. Schweller, "Unanswered Threats: A Neoclassical Realist Theory of Underbalancing," *International Security* 29.2 (2004), 162.

[83] Randal L. Schweller, "China's Aspirations and the Clash of Nationalisms in East Asia: A Neoclassical Realist Examination," *International Journal of Korean Unification Studies*, Vol. 23, No. 2, (2014), 1–40.

[84] Thomas S. Kuhn, "The Structure of the Scientific Revolutions," *International Encyclopaedia of Unified Science*, Vol. 2, No. 2, (1962), 66, 85

[85] Ibid., 89, 102

[86] Yaqing Qin, "Why is there no Chinese international relations theory?" *International Relations of the Asia-Pacific*, Vol. 7, No. 3, (2007) 314

[87] Amitav Acharya and Barry Buzan, *Non-Western International Relations Theory: Perspectives On and Beyond Asia* (London, Routledge, 2010), 3

[88] Yaqing Qin, "Why is there no Chinese international relations theory?" 314

theory.[89] According to the action-oriented definition, theory acts as a guideline for action, such as Mao's *leaning strategy* towards the Soviet Union (alliance politics in the form of the Sino-Soviet Treaty that lasted from 1950 to 1979)[90] and, consistent with the knowledge-oriented definition, theory gives a perspective to understanding the world through knowledge production and reproduction, such as Kenneth Waltz's theory of neo-realism.[91] Knowledge-oriented theory, for realists like Waltz, involves abstracting facts from events to find reoccurring patterns to form a set of assumptions. For instance, for Waltz, it is the distribution of power and how this constrains, enables and influences states decisions (not war itself), that determines great powers' behavior.

1.3 Absence of a Chinese International Relations Theory

In China, it was only after the opening up of the nation, which happened under Deng Xiaoping in late December 1978, that international relations as a discipline witnessed significant development. Earlier, there were only three university departments and three specialized institutes, primarily for China's diplomats. According to Chinese scholars, Chinese international relations theory has been in the second phase of development since the mid-2000; however, a paradigmatic theory is yet to evolve.[92]

In the process of China's international relations theory development, there are three important but disconnected benchmarks. Zhao Tingyang's *A Possible World of All-under-the-Heaven System: The World Order in the Past and for Future is* a philosophical approach to the international political system.[93] He argues that the world comprising the Westphalian state system (that emerged after the Treaty of Westphalia was signed in 1648, bringing an end to the Thirty Years' War in Europe and beginning the modern state system) is a "non-world," and is inconsistent with the basic tenets of structural realism that states are the primary actors in international relations because the international rules-based order exists parallel to the state system. He further argues that the West-dominated world order's problems are rooted in individual state's interests and rationality.[94] For instance, he explains that "cooperative organizations such as UN are formed on the basis

[89] Ibid
[90] Sergey Radchenko, "The Sino–Russian relationship in the mirror of the Cold War," *China International Strategy Review,* Vol. 1, (2019), 269-282
[91] Ibid
[92] Yaqing Qin, "Why is there no Chinese international relations theory?" 8
[93] Zhao Tingyang, *A Possible World of All-under-the-Heaven System: The World Order in the Past and for Future* (Beijing: Zhongxin Chubanshe, 2016) 1-283
[94] Ibid., 35-37

of the very fact of divisions and the implicit principle of independence. The effort of healing the division implies acknowledgment of this division."[95] He proposes a world system based on new rules that would end the division at the international level.[96] It appears that Tingyang's proposed system seeks to address or eliminate the anarchy (lack of an international sovereign) that exists in the present international system. Yet, equally, the forces of anarchy are acknowledged by realist and liberal theorists as a key reality that drives self-help, competition and conflict. Overall, Tingyang's philosophical approach to international relations remains generally a philosophical construct and requires further development to identify variables and relationships between them if it is to become an independent theory of international relations and conflict.

The second major development in Chinese international relations theory development is the idea of "*moral realism*" presented by Yan Xuetong in his book *Ancient Chinese Thought, Modern Chinese Power*.[97] He emphasizes the role of morality in exercising power. For some, moral realism can be regarded as "realism with Chinese characteristics," and for others, it is viewed as merely a form of liberalism. However, Yan has drawn the philosophy of moral realism from an ancient Chinese thinker known as Xunzi, who opined that for a legitimate hegemony to be achieved, authority derived from the combination of power and morality is more effective – and 'moral' – than authority derived from coercive power alone. Xuetong's moral realism is relatively closer to western international relations theories than Tingyang's *A Possible World of All-under-the-Heaven System*, which rejects power politics, seeing it as a primary problem in the way of the world to be all-under-the-heaven.

The development of "*relational theory*" by Yaqing Qin in the article, *A Relational Theory of World Politics* is considered the third major step in the Chinese literature on international relations.[98] The theory posits that the world is composed of interacting entities rather than discrete solitary entities. International actors are "actors-in-relations," (i.e., social relations in which states interact) which shape identity and the role of the social actors (the states). Therefore, international actors base their actions on the nature

[95] Cheng Yuan, Zhao, Tingyang 趙汀陽, *A Possible World of All-under-the-Heaven System: The World Order in the Past and for the Future* 天下的當代性: 世界秩序的實踐和想像. Dao 17, 147-151
[96] Ibid., 220
[97] Yan Xuetong (Author), Daniel A. Bell, & Sun Zhe, eds. Edmund Ryden Trans., *Ancient Chinese Thought, Modern Chinese Power* (New Jersey, Princeton University Press, 2013) 1-320
[98] Yaqing Qin, "A Relational Theory of World Politics" *International Studies Review*, Vol. 18, (2016), 33-47

of relations with others and that "the logic of relationality provides explanation to much of socially meaningful action."[99] Qin's relational theory appears to have a similar basis to the decades-old western international theory of constructivism.

In the last decade, there has been a transition from how to build a Chinese IR theory to the emergence of Chinese international theories; however, a systematic Chinese international relations theory is yet to emerge.

1.4 Realism – A Framework of Analysis

Given the lack of a Chinese-specific IR theory, the theoretical framework for this research follows the neoclassical realist approach. The theoretical framework of neoclassical realism treats "*power*" as the primary variable in analyzing China's emerging nuclear program and when considering its implications for international security. Power in the realist tradition is a contested concept.[100] Based on realist traditions, Stephen Walt wrote that "the concept of power is central to realist theory, yet there is still little agreement on how it should be conceived and measured."[101] According to David Baldwin, there are two different traditions to measure power: power "in terms of the elements of national power approach, which depicts power as resources; and the relational power approach, which depicts power as an actual or potential relationship."[102] Robert Dahl defines the concept of relational power as the state where "A has power over B to the extent that he can get B to do something that B would not otherwise do."[103] However, all realist traditions share that states are continuously struggling for power.

Realism is underpinned by a philosophical worldview based on the premise of a constant and endless power struggle among groups and states in international politics. Realists hold a pessimistic view of the prospects for long-term peace. Realism has a long tradition

[99] Qin, "A Relational Theory of World Politics," 33-47
[100] David Baldwin, "Power and International Relations", in *Handbook of International Relations*, eds. Walter Carlsnaes, Thomas Risse, and Beth A. Simmons (London: Sage, 2002), 177-191. For more detailed analysis, also see Stephano Guzzini, "The Use and Misuse of Power Analysis in International Theory", in *Global Political Economy: Contemporary Theories*, ed. Ronen Palan (London: Routledge, 2000), 55; Joseph S. Nye Jr., *Understanding International Conflicts: An Introduction to Theory and History*, 4th ed. (New York: Longman, 2003), 59
[101] Stephen M. Walt, "The Enduring Relevance of the Realist Tradition," in *Political Science: The State of the Discipline*, eds. Ira Katznelson and Helen V. Milner (New York: W.W. Norton, 2002), 222
[102] Baldwin, "Power and International Relations," in *Handbook of International Relations*, eds. Carlsnaes, Risse and Simmons, 185
[103] Robert Dahl, The Concept of Power. *Behavioral Science* 2, (1957), 202

and includes the writings of Thucydides, Niccolò Machiavelli and Thomas Hobbes.[104] Among all strands of realism, there are some basic shared assumptions.[105] First, individuals form groups and organized groups form states. These 'states' are regarded as the primary actors in international politics and are defined by a territorial boundary and formal recognition by other states and at the UN. Second, anarchy, the lack of a central government or authority at the international level, creates a situation whereby states are responsible for their own survival, which realists view as the baseline goal of states. Thirdly, the anarchic international system dictates that states cannot rely on any other state or institution to guarantee their survival, therefore a state has to rely on self-help to ensure its survival. Together these elements are called *statism*, *survival* and self-*help* (three-S). The realists believe that due to the anarchic structure, conflict and struggle (for survival and power) are inherent in the nature of international politics and, given power is always in flux and changing, so too will the competition be eternal; as different states rise and fall in power, they will correspondingly assert/defend their interests.

Realism has various theoretical strands, including classical or traditional realism,[106] and arguably the most prominent, structural realism or neo-realism and neoclassical realism.[107] Hans J. Morgenthau was a proponent of traditional realism (which came to prominence after World War II). He called it 'realism' because, to him, this indicated that the desire of individuals to seek power was a natural phenomenon – part of their human nature. To be realistic about the world was to recognize this fact rather than indulge in delusions that humans, inherently, had some innate morality; the powerful wrote history in their favor and thus defined what was moral and what was not. Neorealism, articulated by Kenneth N. Waltz in his seminal 1979 book *Theory of International Politics*, contained

[104] Thomas Hobbes, *Leviathan,* ed. C.B. Macpherson. (New York: Penguin Books, 1985); Thomas Hobbes, *The Elements of Law Natural and Politic* ed., Ferdinand Tonnies (London, Routledge, 2020); Thucydides, *History of the Peloponnesian War, Volume I: Books 1-2*. Trans. C. F. Smith. Loeb Classical Library 108. (Cambridge, MA: Harvard University Press, 1919); Niccolò Machiavelli, *The Prince* (New York: Penguin Books, 1981); For more details study see Annette Freyberg-Inan, *What Moves Man: The Realist Theory of International Relations and Its Judgment of Human Nature* (New York: State University of New York Press, 2004), 19-63 (part one); also see Richard Ned Lebow, "The Ancient Greeks and Modern Realism: Ethics, Persuasion, and Power," in Duncan Bell, ed., *Political Thought and International Relations: Variations on a Realist Theme* (Oxford: Oxford University Press, 2008), 26-40

[105] Kenneth Waltz, "Structural Realism after the Cold War" *International Security*, Vol. 25, No. 1 (Summer 2000), 5–41; Randall L. Schweller and David Priess, "A Tale of Two Realisms: Expanding the Institutions Debate" *Mershon International Studies Review*, Vol. 41, No. 1 (May, 1997), 1-32

[106] Hans J. Morgenthau, *Politics among Nations: The Struggle for Power and Peace* (New York: A.A. Knopf, 1948); an intriguing piece by E. H. Carr, *The Romantic Exiles* (GB: Penguin, 1949); John Herz, *Political Realism and Political Idealism* (Chicago: University of Chicago Press, 1951)

[107] Kenneth Waltz, *Theory of International Politics* (New York: McGraw Hill, 1979); John J. Mearsheimer, *The Tragedy of Great Power Politics* (New York: W.W. Norton, 2001)

many identical assumptions of classical realism; however, he linked those assumptions to a more rigorous theory of international politics.

1.4.1 Realism and International Politics

The genesis of contemporary debates on international relations and politics among states can be traced back to the period between the First and Second World Wars.[108] Since then, several analysts and scholars of international relations have tried to contemplate the causes of great wars and general interstate competition. It was the failure of the League of Nations after WWI (representing the liberal ideals of collective security) that raised serious questions and doubts over the ability of international organizations to prevent war and which were founded on the liberal ideals of many statesmen during the interwar period. One prominent critic, Edward Hallett Carr, opined that the League failed to consider the conflicting *interests* of states and the existing political *realities*.[109] Additionally, power continued to change, so the effort by the League to essentially freeze history could not deal with the changing reality of power and the new assertions of power that this inevitably led to. A balance of power could only be sustained if the most powerful states were all status quo powers; as new powerful states emerged, like Nazi Germany, which had little interest in the existing status-quo arrangements and, with its newfound power, sought to overthrow or revise the system in its favor. This seemed to be a pattern reflected throughout history. E. H. Carr's *The Twenty Years' Crisis*, released in 1939, came to be viewed as a classic text of what is now called 'classical realism' in international relations.[110]

Carr criticized idealism by calling it utopian because of its *inter alia*, the overwhelming emphasis on free will, and its false hope of universal moralism. Hedley Bull, while referring to the beliefs of idealists like Woodrow Wilson, Alfred Zimmern, and Philip Noel-Baker, wrote that,

> The distinctive characteristic of these writers was their belief in progress: the belief, in particular, that the system of international relations that had

[108] Norman Angell, *The Great Illusion: A Study of the Relation of Military Power to National Advantage* (New York: G.P. Putnam's Sons, 1913); G. Lowes Dickinson, *The European Anarchy* (New York: Macmillan, 1916); Georg Schwarzenberger, *Power Politics* (London: Jonathan Cape, 1941); Hans J. Morgenthau, *Scientific Man versus Power Politics* (Chicago: University of Chicago Press, 1946); Edward H. Carr, *The Twenty Years' Crisis, 1919-1939: An Introduction to the Study of International Relations* (2nd edn.) (New York: St. Martin's Press, 1946); Morton A. Kaplan, "Is International Relations a Discipline?" *The Journal of Politics.* Vol. 23, No. 3, (1961), 462-476

[109] Martin Griffiths, Terry O'Callaghan and Steven C. Roach, *International Relations: The Key Concepts*, 2nd ed. (London and New York: Routledge, 2008), viii.

[110] Carr, *The Twenty Years' Crisis, 1919-1939: An Introduction to the Study of International Relations*

> given rise to the First World War was capable of being transformed into a fundamentally more peaceful and just world order; that under the impact of the awakening of democracy, the growth of the 'international mind', the development of the League of Nations, the good works of the men of peace or the enlightenment spread by their own teachings, it was, in fact, being transformed; and that their responsibility as students of international relations was to assist this march of progress to overcome the ignorance, the prejudices, the ill-will, and the sinister interests that stood in its way.[111]

Carr further writes that the utopian-optimism of the nineteenth century,

> was based on the triple conviction that the pursuit of the good was a matter of right reasoning, the spread of knowledge would soon make it possible for everyone to reason rightly on this important subject, and anyone who reasoned rightly on it would necessarily act rightly.[112]

Duncan Bell writes that the realist's claims are a mixture of "two separate but frequently overlapping disciplines."[113] Firstly, from the discipline of IR, primarily from the works of classical realists, and secondly, out of a more general "Western political and philosophical reflection."[114] One of the important features of realism is its use of historical evidence from past centuries in order to ascertain "*timeless wisdom*" based upon patterns. These are used as a basis to assess international politics from its 'beginning,' finding that it is based on realpolitik principles that rest upon practical grounds rather than moral considerations.[115]

Several IR scholars tend to conflate Carr's classical realism with Hans Morgenthau's non-systemic theory of the state and Waltz's neorealism.[116] Morgenthau developed six principles of political realism in his famous 1948 book, *Politics among Nations.*[117] Morgenthau's first principle states that "realism is based on objective laws,"[118] rooted in

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[111] Hedley Bull, "The Theory of International Politics, 1919-69," in Brian Porter, ed. *The Aberystwyth Papers: International Politics, 1919-69* (London: Oxford University Press, 1972), 361

[112] Charles A. Jones, *E. H., Carr and International Relations: A Duty to Lie* (Cambridge: Cambridge University Press, 1998), 48

[113] Bell, *Political Thought and International Relations*, 1-25

[114] Duncan Bell, "Introduction: Under an Empty Sky: Realism and Political thought," in Duncan Bell, ed., *Political Thought and International Relations: Variations on a Realist Theme* (Oxford: Oxford University Press, 2008), 1

[115] Michael C. Williams, *The Realist Tradition and the Limits of International Relations* (Cambridge: Cambridge University Press, 2005), 2

[116] John M. Hobson, *The* State *and International Relations* (Cambridge: Cambridge University Press, 2000), 17. Among these scholars, Hobson refers to Robert Gilpin, "The Richness of the Tradition of Political Realism," in Robert O. Keohane, ed. *Neorealism and Its Critics* (New York: Columbia University Press, 1986), 301-21; also see Joseph Grieco, "Anarchy and the Limits of Cooperation: A Realist Critique of the Newest Liberal Institutionalism," in David Baldwin, ed. *Neorealism and Neoliberalism* (New York: Columbia University Press, 1993), 116-42

[117] Hans J. Morgenthau, *Politics among Nations: The Struggle for Power and Peace* (New York: A.A. Knopf, 1948)

[118] Ibid., 4

unvarying human nature; the second that, "statesmen think and act in terms of interest defined as power.;"[119] the third that, "interest defined as power is a universally valid category, and indeed an essential element of politics;"[120] the fourth that "universal moral principles cannot be applied to the actions of states;"[121] and in the fifth, that "all state actors, including our own, must be looked at solely as political entities pursuing their respective interests defined in terms of power."[122] In the last principle, Morgenthau asserts that "politics is an autonomous sphere; it cannot be subordinated to ethics."[123] He calls realism a way of thinking about international relations; however, his fundamental principle of human nature, the notion of power and conflict, has earned criticism. Stanley Hoffman asserts that,

> It is impossible to classify in the same category variables that differ so much from each other like the following: power as a presumption of politics, power as criterion of politics, power as possibility and power in practice, power as sum of means and power as the sum of processes.[124]

Thus, in part because of these criticisms, neorealists emerged who sought to advance traditional realism towards a more systematic and theoretical understanding of international relations. The following section provides an overview of neorealism, its main contours, followed by a discussion of its shortcomings.

1.4.2 Neorealism – An Overview

Kenneth Waltz, the father of neorealism, explains that the relative distribution of power in the system is the most significant factor determining international politics and the system is influenced most by the great powers.[125] Neorealists believe that a system is composed of a structure and its regularly interacting parts (or units known as states). The structure is defined by the arrangement of parts, and only a change of arrangement can bring structural changes. Political structures are defined by ordering principles (decentralized and anarchic), the character of units (functionally identical), and the distribution of capabilities (relative distribution of power in the structure, with concentrations of power primarily measured and defined as the combination of economic and military power). Anarchy is the reality that the great powers are operating in. This is

[119] Ibid., 5
[120] Ibid
[121] Ibid.,9
[122] Ibid., 9-12
[123] Ibid., 12
[124] Robert Keohane, *Neorealism and its Critics*, (New York: Columbia University Press, 1986), 1-27.
[125] Waltz, *Theory of International Politics*

an international system that lacks centralized control, so the primary national interest of states is to survive based upon their own resources (self-help). That is why most powers, irrespective of the ideologies of individual leaders, act in a similar way and engage in internal military build-ups and alliance making.

A bipolar system in which two states hold the majority of the global distribution of power in terms of military, economic and cultural influence and dominate international politics, according to Waltz, is more stable than a multipolar system because it is the only power that checks power – a "scientific law" of international politics, according to famous historian and economist David Hume.[126] Bipolarity limits the opportunities for revision of the status quo by states. To briefly consider the contemporary situation, given China's and the US' power calculus, China is an emerging and, therefore, a potentially revisionist power, especially in key areas – such as the South China Sea and Western Pacific – where it perceives it has vital interests: the US is a status quo power that has the most power in the international system ideologically, economically, institutionally and militarily, albeit its pre-eminence has been eroding as China's relative power has increased in recent decades. However, in the nuclear domain, concepts like Mutually Assured Destruction (MAD) dominate their strategic policies. Neo-realists believe, contra to liberals, that interdependence is not necessarily something that prevents war because in an interdependent scenario, a state's relative gain is comparatively more or a state's relative loss is comparatively less than the other state involved, and this can further increase or decrease the gap in the relative distribution of power, and it is relative rather than absolute gains that states are primarily concerned about.[127] In both cases, interdependence is more likely to generate what realists call the "security dilemma".[128] Robert Jervis defined the

[126] T.V. Paul, James Wirtz, Michel Fortmann, *Balance of Power: Theory and Practice in the 21st Century* (California: Stanford University Press, 2004) 29

[127] Kenneth Waltz, *Man, the State, and War* (New York: Columbia University Press, 1959) 198; Robert Powell, "Absolute and Relative Gains in International Relations Theory," *The American Political Science Review*, Vol. 85, No. 4, (1991), 1303-1320; Charles Lipson, "International Cooperation in Economic and Security Affairs," *World Politics*, Vol. 37, (1984) 1-23; Stanley Hoffmann, "Choices," *Foreign Policy* 12, (1973), 3-42; Robert Keohane and Joseph Nye, *Power and Interdependence* (Boston: Little Brown, 1977); Robert Keohane, *After Hegemony*, (Princeton: Princeton University Press, 1984); Joseph Grieco, "Anarchy and the Limits of Cooperation," *International Organization*, Vol. 42, (1988) 485-507. As Robert Powell notes, states always struggle for power to ensure survival and security, and it is gain relative to a state that other states fear. For realists, the relative gain of a state is viewed as a relative loss of other states, making cooperation more difficult. Furthermore, even absolute gain does not eliminate the virtual threat of war.

[128] Herbert Butterfield, *History and Human Relations* (London: Collins, 1951); John Herz, *Political Realism and Political Idealism: A Study in Theories and Realities* (Chicago: University of Chicago Press, 1951); Robert Jervis, *Perception and Misperception in International Politics* (Princeton, NJ: Princeton University Press, 1976); Robert Jervis, "Cooperation under the Security Dilemma," *World Politics* Vol. 30,

security dilemma as "unintended and undesired consequences of actions meant to be defensive, many of the means by which a state tries to increase its security decrease the security of others, and one state's gain in security often inadvertently threatens others."[129] Given the existence of security dilemmas, Waltz argues, "states are best off when the weapons they use to cope with the security dilemma are ones that make the waging of war among them unlikely, like nuclear weapons."[130] So in this conceptualization, nuclear weapons facilitate peace as they are defensive weaponry – they raise the costs immensely for the other side to attack offensively. Lastly, Waltz asserts that the first concern of states is not to maximize power, unlike offensive realists, but to balance power and to try maintain their relative position in the system.[131]

Waltz's neorealism purports much about foreign policy; however, it does not provide a theory for conducting foreign policy in a practical sense. According to neorealist theory, the quest for security, a priority for states, and the significance of relative power in conducting foreign policy are the main factors in understanding a state's foreign policy. Nevertheless, power and security alone cannot illuminate the different objectives of states, specifically, those of powerful states, which have more diverse and significant opportunities and options they can adopt in their foreign policies (relative to weaker ones). In other words – there is variation in terms of how states go about pursuing the national interest and enhancing their power.

Apart from the title of Waltz's book, he has often emphasized that his theory deals with international politics, which cannot account for foreign policymaking and objectives attached to it and the multiple choices for state behavior, which are designed to "at a minimum, to seek their own preservation and, at a maximum, to drive for universal domination."[132] He further argued that states might act in a dissimilar way or act irrationally, and in those circumstances, they are more likely to suffer. Waltz explained:

> Under most circumstances, a theory of international politics is not sufficient, and cannot be made sufficient, for the making of unambiguous predictions. An international political theory can explain states' behavior only when external pressures dominate the internal disposition of states,

No. 2, (1978) 167-214; Shiping Tang, "The Security Dilemma: A Conceptual Analysis," *Security Studies*, Vol. 18, No. 3, (2009), 587-623

[129] Jervis, Perception and Misperception in International Politics, 66

[130] Waltz, *Theory of International Politics*, 187

[131] Ibid, 127

[132] Ibid, 118

> which seldom happens. When they do not, a theory of international politics needs help.[133]

Neorealism's inability to explain the internal disposition of states and the relationship and influence of internal factors on foreign policy and international relations led to a new theoretical framework, neoclassical realism, emerging in the 1990s. Neoclassical realism aims to bridge the gap between the structural explanation of international politics and the real-world complexities of foreign policy-making based on a combination of both classical/traditional and neorealism/structural realism.[134] Gideon Rose presented the theory of neoclassical realism in 1998 in his review article, *Neoclassical Realism and Theories of Foreign Policy*.[135] In the article, he argues in favor of the addition of unit-level factors that act as intervening variables to help comprehend the correlation between the relative distribution of the power in the system (structural level: independent variable) and foreign policies of states (unit level: dependent variable). On neoclassical realism, Rose further writes:

> It explicitly incorporates both external and internal variables, updating and systematizing certain insights drawn from classical realist thought. Its adherents argue that the scope and ambition of a country's foreign policy are driven *first and foremost* by its place in the international system and specifically by its relative material power capabilities. This is why they are realists. They argue further, however, that the impact of such power capabilities on foreign policy is indirect and complex because systemic pressures must be *translated through intervening variables at the unit level*. This is why they are neoclassical.[136]

To a few, neoclassical realism is an addendum to neorealism, trying to fill in the gaps by explaining "why state X made a certain move."[137] Neoclassical realists tend to agree with neorealists that states are more likely to follow structural imperatives and pressures set by anarchy and the relative distribution of power but also argue that states often undertake decisions which might be at odds with the emphasis neorealists place on the balance of power being of primary importance. Neoclassical realists hold that the rationale for the change in the foreign policy of any state can be analyzed by looking at a state's internal

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[133] Kenneth Waltz, "International politics is not a foreign policy" *Security Studies*, Vol. 6, No. 1, (1996) 57
[134] Randall L. Schweller, "The Progressiveness of Neoclassical Realism," in Colin Elman and Miriam Fendius Elman, eds., *Progress in International Relations Theory: Appraising the Field* (Cambridge Mass.: MIT Press, 2003)
[135] Gideon Rose, "Neoclassical Realism and Theories of Foreign Policy" *World Politics*, Vol. 51, No. 1, (1998), 144-172
[136] Rose, Neoclassical Realism and Theories of Foreign Policy, 146. Text italicized by the author of this thesis.
[137] Waltz, *Theory of International Politics*, 121

composition and the idiosyncrasies of state leaders. Hence, neoclassical realism also addresses the level of analysis problem: a problem said to result from the reductionist approach of other international relations theories, including earlier variants of realism. These, according to their critics, tended to include only one level or factor (either the unit or state or system level) in their analysis of an event or conflict and ignore other causally important factors.

Rose has focused on two intervening variables: a state's perception and misperception of the international system, and a state's capability to extract and manage domestic resources. These two variables raise two issues: firstly, whether the state or its leaders have the ability to react to both restraints and inducements imposed by the system, and secondly, whether they have the capability to do so. By interlinking variables across the levels of analysis, neoclassical realism plays a role in binding the traditional and neoclassical variants of realist theory together with contending theoretical approaches that focus on domestic-level explanations, such as liberalism and constructivism. Although internal factors have been part of traditional realist political thought, they were largely ignored or overlooked by Waltz for the sake of theory building. Having said that, power is still *primus inter pares* (first among equals) for neoclassical realists. It is the power (variable) for neoclassical realists that still has the most significant effect on shaping a state's behavior. The next section examines the detail of neoclassical realism and its postulates and forges the framework utilized for this research project.

1.5 Neoclassical Realism

Analyzing the impact of relative power differences on foreign policy is the central objective of neoclassical realists. The main factor or variable in neoclassical realism is the relative capabilities of a state with respect to other states and the threat others pose. The secondary factors of analysis are the perceptions and understandings of policymakers or decision-makers of systemic impositions, economic and technological developments, and the role of bureaucracy/organization, which encourages them to take certain 'rational' decisions. For instance, in the case of China, the structural pressure from the outside comes predominantly from the US (the existing superpower) and its allies; China's internal factors; its economic capabilities, political organizations/military bureaucracies, and its leadership's decisions play a role in interpreting the external threat, and the

responses China has on hand to react, confront or challenge it, and thus they help shape an internal response to the external threat.

To neorealists, classical realists are reductionists because they focus primarily on the unit (individual) level of analysis and ignore the structural imperatives when comprehending international politics. To neoclassical realists, both neorealists and classical realists are reductionists because the former focus on the international structure and offer a systemic explanation for international politics, and ignore the latter's explanation that a state reflects human nature in international relations. Therefore, both classical realists and neorealists lack a significant "*half"* of each other, and neoclassical realism in this regard is trying to overcome their shortcomings, joining them into a whole.[138]

Neoclassical realism does not outright reject the suppositions of neorealism but seeks to alter them to enhance the explanation of state behavior. Neoclassical realists, like neorealists, focus most on power and define it in terms of material capabilities. Nevertheless, unlike neorealists, they do not only emphasize the systemic level of analysis. To neoclassical realists, subjective views of individuals and domestic structures and organizations within states are also important factors.

Neoclassical realists, like other realists, do not challenge the existence of international anarchy. However, for them, "international anarchy is neither Hobbesian [offensive realist] nor benign [defensive realist] but rather murky and difficult to read."[139] They assume that there is an objective reality out there to be understood and a point of reference; relative power differentials exist and have severe effects on state policies which need to accurately read the power balance and act accordingly. For them, the foreign policy of a particular state is reflective of its relative power in the anarchic international structure. However, despite that, the importance of state and unit-level variables cannot be ignored either. Hence, the relationship between the relative power of a state and foreign policymaking cannot be well understood until both the internal and external milieu of a state are taken into account in its operation.

Neorealists argue that structural effects on agents (states) happen directly, without any mediatory roles. However, neoclassical realists see a set of mediating variables, such as

[138] John Baylis, "International and Global Security in Post-Cold War Era" in J. Baylis, & S. Smit (Eds.), *The Globalization of World Politics: An Introduction to International Relations.* (New York: Oxford University Press, 2001)
[139] Rose, Neoclassical Realism, 152

a particular state's internal structure, perceptions and evaluations of its leaders about the relative power and threat-level generated by the system (as noted above, a system can be viewed as being comprised of predominantly offensive or defensive states). In short, Waltz's neorealism is a more top-to-bottom approach. It can only identify the modes of the systemic pressure of units, but how states may respond to systemic pressures is not a focus of neorealists.

Neoclassical realists argue that both cognitive and systemic variables provide a better understanding of state behavior in international relations than merely using systemic variables. Cognitive variables may include perceptions and misperceptions of individuals of the structural pressures and threats.[140] Moreover, leaders are always co-opted by the events of the external milieu as they react to them domestically. Their reactions and approaches to events are based on factors such as their specific ideas, beliefs, threat perceptions, historical background and experiences, the domestic regime they operate in, and the role of pressure and interest groups. For instance, President Xi's father had been a prominent figure in the Communist revolution and "a comrade in arms with both Mao Zedong and Deng Xiaoping."[141] Therefore, Xi Jinping has been accustomed to the top echelons of the CCP since childhood. His experience and suffering during the Cultural Revolution led him to believe in the necessity of a strong and centralized CCP to govern China.[142] President Xi has effectively linked military reforms, particularly nuclear weapons force modernization, with national forms to ensure undisputed political support at home. A detailed discussion on the critical role of President Xi, among other internal factors in China's security policymaking and reforms, is presented in Chapter Four.

There are two prominent criticisms of neoclassical realism.[143] Firstly, its variables at the domestic level have been introduced only to explain away the irregularities of neorealism, and secondly, it lacks the parsimony and precision of effective prediction.[144] Without the

[140] Tim Dunne and Brian T. Schmidt, "Realism" in John Baylis et al. ed., *Globalization of World Politics*. (UK-Oxford: Oxford University Press, 2017)
[141] Jeffrey Bader, "How Xi Jinping Sees the World…and Why, Order from Chaos: Foreign Policy in a Troubled World," *Asia Working Group Paper 2*, February 2016, accessed July 13, 2021, https://www.brookings.edu/wp-content/uploads/2016/07/xi_jinping_worldview_bader-1.pdf
[142] Ibid
[143] Jeffrey W. Legro and Andrew Moravcsik, "Is Anybody Still a Realist" *International Security*, Vol. 24, No. 2, (1999), 5-55; Andrew Moravcsik, "Theory Synthesis in International Relations: Real Not Metaphysical" in Gunther Hellmann (eds.) Are Dialogue and Synthesis Possible in International Relations? *International Studies Review*, Vol. 5, (2003) 123-153; John A. Vasquez, "The Realist Paradigm and Degenerative versus Progressive Research Programs: An Appraisal of Neotraditional Research on Waltz's Balancing Proposition" *The American Political Science Review*, Vol. 91, No. 4, (1997), 899-912.
[144] Ibid

latter, testing/falsification of hypotheses is difficult. However, Rose maintained that deliberately kept parsimony was intended to enhance the explanatory power of the framework:

> Neoclassical realism has compensating advantages, particularly in the opportunities it offers for building satisfying comprehensive explanations of foreign policy without abandoning the theory's core assumptions. Its very looseness, in other words, makes it a useful framework for carrying out the kind of midrange theorizing that so often is the best social science can hope to achieve.[145]

Rose, therefore, views the 'looseness' of neoclassical realism as key to describing what is often the very complex situations leaders and states find themselves in – it is possible that one could never create a truly comprehensive and predictive theory of IR; neoclassical realism is a flexible and effective tool that allows us to make some progress in understanding and deciphering state behavior, and to hazard a guess at the future course of state behavior and events.

1.5.1 **Neoclassical Realism and China**

China's emerging nuclear program, nuclear force restructuring, and modernization in the past few years have generated a new debate among scholars of international security and generated widespread concern about China's increasing assertiveness both regionally and globally, and its long-term intentions. China's accumulation of greater relative power compared to its main rivals, especially the US, is continuing and is intrinsically important to its global rise. However, the variable of relative power is not enough to explain the qualitative and quantitative improvements in China's nuclear policy on its own. This chapter has explained the neoclassical realist argument that relative power, in addition to a confluence of economic and technological capabilities, and the role of leaders, serves as important variables as a set. In short, the strategic significance of the emerging nuclear policy of China and its goal of national rejuvenation[146] – a major domestic political goal and issue – can be viewed as being entangled with the perception of China's growing relative power. Together, they have influenced the Chinese leadership in recent years to pursue a new and more assertive nuclear policy relative to the past. [147] This thesis uses

[145] Rose, Neoclassical Realism and Theories, 168.
[146] Xi Jinping, *The Governance of China* (US: Intercultural Press, 2014)
[147] Austin Ramzy, "President Xi Jinping's Rise in China," *The New York Times*, February 26, 2018, accessed July 25, 2018, https://www.nytimes.com/2018/02/26/world/asia/xi-jinping-career-highlights.html

neoclassical realism to examine China's emerging nuclear force modernization and its implications for international security.

For most of the three decades following 1964, China's nuclear weapons policy was based on the broad contours of sustaining minimum deterrence. This included de-mated payloads, and, most importantly, a nuclear No-First-Use (NFU) pledge. However, new structural realities that appeared after the end of the Cold War produced forces that are compelling China to evolve and advance its nuclear weapons policy. The changes have become more evident since Xi Jinping became president in 2013. The internal or domestic dimensions, such as the leader's role, brought new changes in China's nuclear weapons force modernization. This is discussed in Chapters Four and Five. These internal drivers of change, when coupled with external drivers of change, bring China's nuclear force posture to the level of its conventional force posture which supports pre-emption in war-fighting, asymmetry, and the development and deployment of conventional capabilities that are offensive in nature.[148] According to a 2017 Research and Development organization (RAND) study, with the changes introduced in 2015, China's nuclear and conventional force postures are now more unified, adaptable, and dynamic than official claims suggest. This thesis also shows that a *de-facto* change from minimum deterrence favoring a limited nuclear war posture has taken place.[149]

The interaction between internal and external factors is leading China's political elite to alter the existing nuclear program. This is likely to lead towards greater strategic insecurity, manifested in a "security dilemma," as other states react to China's changing policies if they have not already done so.[150] Later chapters will examine the facets of this issue and investigate the contemporary security dilemma between China and the major rivals that stem, in part, from China's evolving nuclear posture, doctrine, and force structure.

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[148] Michael S. Chase , Andrew S. Erickson and Christopher Yeaw, "Chinese Theater and Strategic Missile Force Modernization and its Implications for the United States," *Journal of Strategic Studies*, Vol. 32, No. 1, (2009), 67-114

[149] Eric Heginbotham, Michael S. Chase, Jacob Heim, Bonny Lin, Mark R. Cozad, Lyle J. Morris, Christopher P. Twomey, Forrest E. Morgan, Michael Nixon, Cristina L. Garafola and Samuel K. Berkowitz, *China's Evolving Nuclear Deterrent: Major Drivers and Issues for the United States*. (Santa Monica, CA: RAND Corporation), 2017. https://www.rand.org/pubs/research_reports/RR1628.html. Also available in print form.

[150] Robert Jervis, "Cooperation Under the Security Dilemma," *World Politics*, Vol. 30, No. 2, (1978), 167-214; Camilla Sorensen, "Is China Becoming More Aggressive? A Neo-classical Realist Analysis," *Asian Perspective*, Vol. 37, Issue. 3 (2013), 368

To reiterate, neoclassical realism will help answer the two research questions: (1) What accounts for the emergence of China's nuclear weapons program, and what has propelled its evolution since its inception? And (2) What are the implications of China's emerging nuclear weapons program for regional and global security? Or in other words, How are other states are responding to China's emerging nuclear weapons? That is, how the external strategic environment and internal security milieu of other states are being shaped by China's emerging nuclear weapons program. The structural factors of the framework can help to understand both the structural options and constraints, and relevant factors accounting for China's emerging nuclear policy and its implications. Similarly, the internal or domestic factors highlighted by neoclassical realism help us understand the domestic reasons for China's nuclear program evolving in the manner it has.

The next part of the chapter explores the historical evolution of nuclear deterrence theory and defines and examines the underlying assumptions of the theory. It explores the origin of the theory of nuclear deterrence in the Cold War, where bipolar order involving intense US-Soviet nuclear competition (and to a lesser extent China-US and China-Soviet nuclear competition) took place. Subsequently, it examines the evolution of deterrence theory in the US-dominated unipolar post-Cold War international system. Lastly, the scholarship identifies and establishes the differences between deterrence and compellance. Some key concepts used in the thesis are also outlined in this section. Doing this is important because the US and Chinese nuclear weapons programs are interdependent to some degree – that is, developments in one are taken into account by the other in terms of how they organize their nuclear weapon capabilities and strategy. The comparison will also help better understand the Chinese approach to deterrence, which will pave the way for analyzing China's nuclear weapons program in subsequent chapters.

1.6 Theory of Deterrence

According to Charles Darwin and Alfred Wallace, deterrence is as ubiquitous in the social world as it is in the natural world.[151] In international relations, deterrence is a situation where a state's threat to retaliate violently is designed to prevent another state from attacking it because the perceived costs of attacking outweigh the perceived benefits. In the nuclear realm, the threat of retaliation and mutual destruction due to the massive destructive power of nuclear weapons should ensure that the cost of nuclear war – or of

[151] Frederick Burkhardt (ed.), *The Correspondence of Charles Darwin,* Vol. 15: *1867* (Cambridge: Cambridge University Press, 2006), 105-110

launching a nuclear first strike – will outweigh the benefits. However, such a simple definition is deceptive. The theory of nuclear deterrence is multi-layered, complex, and varies according to different scenarios. For instance, the nature, scale, and type of attack in question, whether it is conventional or nuclear, limited or full-scale, pre-emptive or preventive attack, are all important factors in deterrence calculations. The role of rationality (and irrationality) in crises, escalation pressures during crises and target selection (counter-force and counter-value) may require different capability requirements to enact and pose credibility challenges. During the Cold War, the debates over these interrelated issues reflected the complex nature of understanding nuclear deterrence and the difficulties in forging a coherent theory and employing a successful deterrent strategy. It would be thought that nuclear weapons would make deterrence easy, but it has proved to be a complex and arduous task, and many complications remain today. To begin an exploration of deterrence theory, we start by defining nuclear deterrence.

1.6.1 **Origin of Nuclear Deterrence**

Deterrence, derived from the Latin word *terrere* (frightening), means to discourage or restrain action by fear. It shares an etymological root with the word 'terror,' which is based on fear, reflecting that it is a severe kind of discouragement coupled with a threat to impose severe consequences if an unwanted action is undertaken. Since interstate deterrence is generally reliant on levels of material power and threat dynamics, realism is a logical approach through which to comprehend and examine deterrence. Indeed, Thucydides' account of the Peloponnesian War (435-411 BCE) reflects the centuries-old interplay of deterrence and compellance.[152] Deterrence as a theory can also be traced back to the early classical philosophers such as Thomas Hobbes,[153] Cesare Beccaria,[154] and Jeremy Bentham.[155] Together, these social contract philosophers paved the way for the development of modern deterrence theory.

In recent world history, deterrence as a concept can be traced back to the early decades of the twentieth century. George Questor writes that prior to World War II, due to

[152] Richard Ned Lebow, "Thucydides and Deterrence," *Security Studies*, Vol. 16, No. 2 (April/June 2007), 163-188

[153] Alan Norrie, Thomas Hobbes and the Philosophy of Punishment, *Law and Philosophy*, Vol. 3, No. 2, (1984), 299-320

[154] Cesare Beccaria, *On Crimes and Punishments* (New York: Macmillan, 1963). Translation of introduction by Paolucci H. Original work published in 1764.

[155] Jeremy Bentham, *An Introduction to the Principles of Morals and Legislation* (New York: Macmillan, 1948); also see Lawrence Freedman, *Deterrence* (Polity Press: Boston, 2004)

significant developments in the defense industries of great powers during the industrial revolution, scholars struggled to explain offense and defense theory.[156] The theory argues that international conflict and war are more likely when the offense (offensive military forces) has an advantage over the defense (defensive military forces), and peace is likely when the defense has an advantage over the offense. Technology plays an important role in determining the balance between offense and defense. If technology favors offense, aggressors are likely to secure quick and decisive victories. This exacerbates the security dilemma and intensifies the arms race.[157] According to Questor, terms such as deterrence, compellance, deterrence by retaliation, escalation control, and even the much-vaunted 'balance of terror' all existed before World War II.[158] However, with the advent of nuclear weapons, deterrence assumed a new shape as the new nuclear dimension led to immense concerns over escalation, given escalation to a nuclear war would destroy nations.

Before discussing the evolution of nuclear deterrence theory, it is essential to introduce a caveat: deterrence *theory* is different from *deterrence strategy*.[159] The role of theory, as defined earlier, is to develop a systematic way to organize ideas (variables) to explain a particular phenomenon. In international relations, a theory is a broad set of empirically testifiable and interlinked ideas (variables) developed to describe and explain events. Some international relations theories offer predictive analysis as well.

The word 'strategy' generally has a military connotation in the strategic studies literature. Strategy lies between policy and tactics, and it is different from doctrine.[160] The term strategy is often considered analogous to policy or doctrine. However, these concepts are

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[156] George Questor, *Deterrence Before Hiroshima* (New Jersey: Transaction Publishers, 1986), 1-2; Jervis, Cooperation under the Security Dilemma, 167-214; George H. Quester, *Offense and Defense in the International System* (New York: John Wiley and Sons, 1977); Stephen Van Evera, "Offense, Defense, and the Causes of War," *International Security*, Vol. 22, No. 4, (1978), 5-43; Charles L. Glaser and Chaim Kaufmann, "What Is the Offense-Defense Balance and Can We Measure It?" *International Security*, Vol. 22, No. 4, (1998), 44-82; and Sean M. Lynn-Jones, "Offense-Defense Theory and Its Critics," *Security Studies*, Vol. 4, No. 4, (1995), 660-691

[157] Keir A. Lieber, "Grasping the Technological Peace: The Offense-Defense Balance and International Security, *International Security*," Vol. 25, No. 1, (2000), 71

[158] Ibid, 190-195

[159] Patrick M. Morgan, Deterrence Now (Cambridge: Cambridge University Press, 2003); Patrick M. Morgan, "The State of Deterrence in International Politics Today," *Contemporary Security Policy*, Vol. 33, No. 1, (2012) 85-107

[160] Lawrence Freedman, *Strategy: A History* (Oxford, Oxford University Press, 2013), 206; Morton A. Kaplan, "An Introduction to the Strategy of Statecraft," *World Politics*, Vol. 4, No. 4, (1952) 548-576; Hew Strachan, *Clausewitz's On war: A Biography* (London: Atlantic Books, 2007), 70-73; Hew Strachan, "Strategy and Contingency," *International Affairs*, Vol. 87, No. 6, (2011) 1281-1296; B.H. Liddell Hart, *Strategy*, 2nd ed. (New York, NY: New American Library, 1974), 321; Hew Strachan, *The Direction of War: Contemporary Strategy in Historical Perspective* (Cambridge: Cambridge University Press, 2013), 12

not interchangeable. Policy is broad guidance in the shape of a directive or instruction outlining national political aims and objectives.[161] It is a deliberate effort to explore certain avenues. In military operations, a policy may not be limited only to defining aims and objectives but also terms of engagements, defining what qualifies as a strike and what may not, or under which conditions one may strike. Figure 1 below shows that policy stands above and governs strategy, and strategy governs tactics.

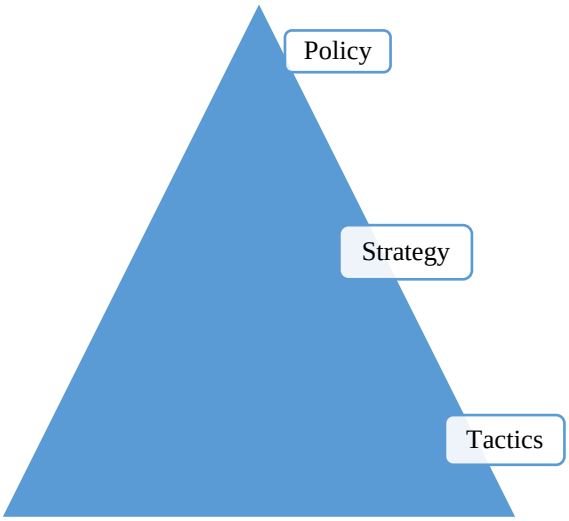

Figure 1: The policy-strategy-tactics hierarchy

The word strategy is derived from the Greek word *strategos*, which means 'general' (a high-level military commander).[162] Military strategy relates to military engagements and defines the appropriate and effective conduct of military operations to achieve policy (political) objectives. Clausewitz defines strategy as "the use of the engagement for the purpose of the war."[163] Therefore, a *strategy* is a continuous process of matching means, ways, and ends to achieve desired objectives within acceptable risk limits. *Doctrine* is a policy of strategy. It offers considerations on how to achieve military objectives on the ground. Military doctrines come with authority and hence are generally rigid in their written formulation. In practice, on the battlefield, forces are in a fluid and highly stressful situation. They, therefore, may not always follow their orders to the letter. In the nuclear realm, given that nuclear weapons pose existential risks, we would hope doctrine would be abided by.

[161] Ibid
[162] Rich Horwath, "The Origin of Strategy," *Strategic thinking Institute*, 2006, accessed May 5, 2019, https://www.strategyskills.com/Articles/Documents/origin_strategy.pdf
[163] Carl von Clausewitz, *On War*, (eds. and trans. Michael Howard and Peter Paret) (Princeton: Princeton University Press, 1976), 129

Tactics on the battlefield are governed by strategy. Tactics are concrete, small purposeful steps with limited time-windows for implementation of the strategy. As Sun Tzu, the Chinese philosopher, notes, "strategy without tactics is the slowest route to victory. Tactics without strategy is the noise before defeat."[164]

Figure 2 below shows the strategic decision-making and implementation hierarchy. Politics stand on the top and govern policy, policy identifies the type of strategy needed, and strategy governs tactics on the battlefield. Doctrine is a manual to military victory. Nuclear deterrence involves all of these.

Figure 2: The policy- (doctrine) strategy-tactics hierarchy

The theory of nuclear deterrence has evolved in four waves. These are discussed in the next section. The subsequent sections outline the chronological historical evolution of nuclear deterrence theory.

1.6.2 Evolution of Nuclear Deterrence

As a theory, deterrence has evolved in four waves, each different in some ways from the previous in response to new thinking and changing strategic contexts. However, the subject matter has remained largely the same, focusing on how states can and should deter other states' behaviors. In the late 1970s, Robert Jervis identified three waves of

[164] Jim Fette, "Avoid the 'Noise Before Defeat', *Medium*, January 5, 2019, accessed March 6, 2019, https://medium.com/@jim.fette/avoid-the-noise-before-defeat-c7ceddb35873

deterrence, and the fourth wave came into literature after the 9/11 incident wherein non-state-actors (NSA) or sub-state actors were suddenly elevated in importance in the deterrence matrix. [165]

1.6.2.1 The First Wave of Deterrence Theory

Shortly after the use of nuclear weapons in World War II, Bernard Brodie, who was called the Dean of America's post-war civilian strategists[166], wrote, "everything that I have written is obsolete."[167] Brodie initially articulated the fundamental logic of what later became the theory of nuclear deterrence. Discussing the political effects of nuclear weapons and their implications after they had played a decisive role in ending World War II, Brodie stated that "thus far the chief purpose of our military establishment has been to win wars…from now on its chief purpose must be to avert them…it can have almost no other useful purpose." [168] Though the statement later became the base of nuclear deterrence theory, it is often quoted for its influence on decision-makers in leading them to conclude that they had to avoid war in the nuclear age. However, at the time, Brodie was arguing more narrowly in support of assured retaliation, the idea and strategy that in case of a nuclear weapons attack from an adversary, the US had to have a capability that allowed it to credibly threaten nuclear retaliation against the aggressor. This would help maintain deterrence.

Brodie claimed that nuclear weapons could not be used like conventional weapons, as a nuclear war would destroy both sides. He viewed nuclear weapons "as a powerful deterrent to aggression against great powers," therefore, states will struggle to refrain from acquiring them, "because not doing so would encourage aggressive behavior by

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[165] Robert Jervis, "Deterrence Theory Revisited," *World Politics*, Vol. 31, No. 2, (1979), 289-324; John Neumann and Oscar Morgenstern, *Theory of Games and Economic Behavior*, 1944, http://www.archive.org/details/theoryofgamesand030098mbp; for a review of its impact see Glenn H. Snyder, '"Prisoner's Dilemma" and "Chicken" Models in International Politics Author,' *International Studies Quarterly*, Vol. 15, No. 1, (March, 1971), 66-103; H. R. McMaster, *Dereliction of Duty: Lyndon Johnson, Robert McNamara, the Joint Chiefs of Staff, and the Lies that Led to Vietnam* (New York: Harper Perrennial, 1998), 5

[166] Gregg Herken, The not-quite-absolute weapon: Deterrence and the legacy of Bernard Brodie, *Journal of Strategic Studies*, Vol. 9, No. 4, (1986) 15-24

[167] Alex Abella, *Soldiers of Reason: The RAND Corporation and the Rise of the American Empire* (Orlando: Harcourt Inc., 2008), 41

[168] Bernard Brodie ed., Frederick Sherwood Dunn, Arnold Wolfers, Percy Ellwood Corbett, and William Thornton Rickert Fox. *The absolute weapon: Atomic power and world order*, eds., (New York: Harcourt, 1946), 76

those that did."[169] And while he characterized nuclear weapons as *absolute* because states could be defenseless against their immense destructive power, Brodie further writes that,

> men have in fact been converted to religion at the point of the sword, but the process generally required actual use of the sword against recalcitrant individuals. The atomic bomb does not lend itself to that kind of discriminate use.[170]

Therefore, he stressed that nuclear deterrence strategy should be a war-avoiding strategy. This is different from a conventional deterrence strategy because, according to him, the nuclear deterrence strategy is a *counter-value* strategy that focuses on targeting population centers and industrial zones (counter-value targets). The conventional deterrence strategy is a *counter-force* strategy that includes targeting military infrastructures and deployments (counter-force targets). He writes,

> if the aggressor state must fear retaliation, it will know that even if it is the victor, it will suffer a degree of physical destruction incomparably higher than that suffered by any defeated nation in history…the threat of retaliation does not have to be 100 percent certain; it is sufficient if there is a good chance of it, or if there is a belief that there is a good chance of it. The prediction is more important than the fact.[171]

Henry Kissinger had a similar point of view on nuclear weapons, saying,

> a threat to be effective, need not be absolutely credible. An aggressor may be reluctant to stake his national existence for a marginal gain even if he should have some doubts about whether a threat will in fact be implemented.[172]

Apart from Brodie, Arnold Wolfers, who is among the early writers on nuclear weapons and deterrence, opined that the threat of nuclear retaliation is the strongest deterrent and "parity in deterring power" [nuclear] would guarantee peace.[173] Wolfers' argument is relevant to the level of strategic parity reached between the US and the Soviet Union that had been established by the early 1970s, as he viewed that to deter, the US needed to stop the Soviet Union from anticipating it could achieve victory in a nuclear war.[174] Robert Oppenheimer, also known as the father of the atomic bomb, also falls into the category of the first wave theorists. He said nuclear weapons are "for aggressors and elements of

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[169] Ibid
[170] Ibid., 21
[171] Ibid., 74
[172] Henry Kissinger, *Nuclear Weapons and Foreign Policy*, (New York: Council on Foreign Relations Press, 1957), 134
[173] Brodie et al., *The Absolute Weapon*, 134-136
[174] Rebecca Grant, "The Second Offset," *Air Force Magazine 2016*, accessed July 25, 2018, https://www.airforcemag.com/PDF/MagazineArchive/Documents/2016/July%202016/0716secondoffset.pdf

surprise and terror are intrinsic to it."[175] Oppenheimer believed that deterring nuclear aggression was possible only with nuclear weapons and the threat of retaliation.

In retrospect, all the first wave theorists highlighted a common understanding that a credible threat of nuclear retaliation was the best deterrent to prevent other nuclear-armed adversaries from aggression. In the mid-1950s, Bernard Brodie's ideas were reflected in official doctrine when then-Secretary of State John Foster Dulles articulated the *Massive Retaliation doctrine* against the Soviet military threat.[176] In January 1954, while addressing the Council on Foreign Relations, Dulles said the security of the US would emphasize "more reliance on deterrent power and less dependence on local defensive power," a concept later known as the doctrine of massive retaliation.[177] According to Freedman and Jeffrey Michaels the doctrine was "widely assumed to be founded on an indiscriminate threat to respond to any communist-inspired aggression, however marginal the confrontation. This would take the form of a massive nuclear strike against the centers of the Soviet Union and China."[178] For Brodie, Sir John Slessor's explanation of massive retaliation "no line of thinking, let alone of action, must be permitted to impair the value or effectiveness of deterrence" is the clearest explanation.[179]

It was during the first wave that terms such as *security dilemma* and *stability-instability paradox* were coined. John Herz first coined the term security dilemma.[180] He explained how the security of states, which is mutually interdependent, breeds insecurity in the anarchic international system. Herz writes that "It is one of the tragic implications of the security dilemma that mutual fear of what initially may never have existed may subsequently bring about exactly that which is feared most."[181] Herz has outlined six broad aspects of the security dilemma. According to him, the security dilemma is a self-regulating *vicious circle* in the international system, which is *anarchic* – it lacks a central authority. He writes that states' *insecurity and fear of being attacked* motivate states to

[175] John W. Dower, *Cultures of Wars*, (New York: W. W. Norton, 2010), 211
[176] Samuel F. Wells, Jr., The Origins of Massive Retaliation, *Political Science Quarterly*, Vol. 96, No. 1, (Spring, 1981), 34
[177] Address by J F Dulles, "The Evolution of Foreign Policy," January 12, 1954, Department of State Bulletin 30 (January 25, 1954), 107-110
[178] Lawrence Freedman and Jeffrey Michaels, *The Evolution of Nuclear Strategy* (London, Palgrave Macmillan, 2019), 103
[179] Bernard Brodie, *The Influence of Mass Destruction Weapons on Strategy* (Santa Monica, CA: RAND Corporation, 1955); Sir John Slessor, Strategy for the West (London: Cassell, 1954); Ibid, 108
[180] John Herz, *Political Realism and Political Idealism: A Study in Theories and Realities* (Chicago: University of Chicago Press, 1951), 157
[181] John Herz, *International Politics in the Atomic Age* (New York: Columbia University Press, 1961), 241

pursue *self-help* by accumulating more power, which generates a perpetual struggle for power among states. An attempt to enhance security via increases in military power and deployment of new capabilities means that the *security dilemma eventually becomes self-defeating* because it generates tit-for-tat responses by other states that ultimately undermine the security of all states. Lastly, he opined that the security dilemma is *one of the causes of war* but not the cause of them all.[182] In short, efforts to improve the security of one state creates insecurity for others and vice-versa. Later, Robert Jervis offered a more detailed, but similar explanation, of the security dilemma. He notes that the security dilemma exists when "many of the means by which a state tries to increase its security decrease the security of others."[183] This led Charles Glaser to write that Jervis labeled the security dilemma as a "*spiral model*," describing "how the interaction between states that are seeking only security can fuel competition and strain political relations."[184] The dynamics of security dilemma equally exist in the nuclear realm. Jervis viewed statecraft as being driven by *fear under anarchy*, therefore even two peaceful states may view each other's defensively orientated deployments to be motivated by offensive designs. He writes that the scale and nature of the security dilemma rests upon two major variables: the offense-defense balance and offense-defense differentiation (whether weapons and policies that protect the state also provide the capability for attack) of relative military forces between states, leading to the security dilemma and a spiral of arms racing.[185] There also exists an environment wherein the security dilemma situation extends to more than two nuclear weapons states, leading to the security multilemma.

The security dilemma also exists between alliances, leading to fear of entrapment and abandonment. In alliance politics, states trade off security for autonomy. According to Glenn Snyder, an ally may maximize security but inevitably minimize autonomy by alliance formulation.[186] In negotiating alliances, weaker states are vulnerable to the risk of abandonment and entrapment. Snyder has gone further to explain three types of

[182] Ibid., 234-235; Herz, *Political Realism and Political Idealism*, 12
[183] Robert Jervis, "Cooperation Under the Security Dilemma" *World Politics* Vol. 30, No.2, (January 1978), 169
[184] Charles L. Glaser, "The Security Dilemma Revisited," *World Politics*, Vol. 50, No. 1, (1997) 171-201
[185] Jervis, "Cooperation Under the Security Dilemma," 167-214; Robert Jervis, "Was the Cold War a Security Dilemma?" *Journal of Cold War Studies* Vol. 3, No.1, (Winter 2001), 55-56 and Robert Jervis, *The Meaning of the Nuclear Revolution: Statecraft and the Prospect of Armageddon* (Cornell University Press, London, 1989), 64-66, 116
[186] Glenn H. Snyder, "The Security Dilemma in Alliance Politics," *World Politics*, Vol. 36, No. 4, (1984) 461-495; for more details Glenn H. Snyder, *Alliance Politics* (Ithaca: Cornell University Press, 1997)

possible abandonment that may occur during alliance politics.[187] In the first situation, an ally may revoke an alliance treaty or agreement and maintain a position of non-ally or formulate an alliance with the former adversarial state. In the second, an ally may decide to follow neither a treaty or agreement, abrogate it, and lastly, an ally may willingly withhold support in a circumstance where it was required.

Entrapment, on the other hand, is the danger of an ally being drawn into "conflict over an ally's interests that one does not share, or shares only partially."[188] To overcome this risk, an ally may keep the partner at a distance or reduce the commitment to the alliance by renegotiating the commitments between the alliance partner and its opponents through political means.[189] Lastly, an ally may choose to risk abandonment over entrapment on the assumption that the cost of the latter surpasses the former.

There is an inverse relationship between the risk of abandonment and entrapment and, according to Snyder, it can lead to an alliance security dilemma – measures to decrease the risk of entrapment increase the risk of abandonment and vice-versa.[190] States, because of scarce resources, have bounded options in decision-making, therefore, they prioritize certain policy objectives and take risks to achieve them. As members of the alliance pursue a mutual compromise, the alliance security dilemma appears critical to all the members because it correlates with risk. Snyder examines the degree of alliance security dilemma from three levels: the level of mutual interest, the level of asymmetric dependence, and the level of commitment.[191] He believes that if the mutual interest level among the alliance members is high on a particular issue, the alliance security dilemma decreases and vice-versa. Secondly, asymmetric capabilities may make weak members rely on other members' military capabilities to perform when needed and to protect them. If the difference in military capabilities is high, the level of asymmetric dependence is also higher. In such a condition, a weak alliance member's fear of abandonment could outweigh its fear of entrapment, further intensifying the alliance security dilemma. Thirdly, the level of explicit commitment to the alliance determines the degree of alliance security dilemma; explicit commitment diminishes the chance of abandonment and vice-versa. Another prominent feature of alliance politics is buck-passing, emphasized by

[187] Snyder, *The Security Dilemma*, 466-468
[188] Ibid, 467
[189] Glenn H. Snyder, *Alliance Politics* (Ithaca: Cornell University Press, 1997), 185-186
[190] Ibid, 181
[191] Snyder, *The Security Dilemma*, 471-477; Ibid, 186-192

Mearsheimer. He notes that whenever a new great power rises, one or more states end up checking the rising power. However, initially, each state will try to get other states to check the new power – this is known as passing the buck or buck-passing.[192] The discussion on the security dilemma above will be further addressed in Chapters Six, Seven, and Eight.

Stability-Instability Paradox

In 1954, while weighing the outcomes of the Soviet Union's production of thermonuclear weapons, the deterrence strategist, B. H. Liddell Hart, claimed the "H-bomb [hydrogen bomb, second-generation nuclear weapon with greater destructive power than first-generation atomic bombs] reduces the likelihood of full-scale war, [but] it increases the possibility of limited war."[193] Hart implied that the greater destructive power of the H-bomb would minimize the risk of full-scale wars but increase the likelihood of limited war; the situation also known as the *stability-instability* paradox. The paradox theory states that the immense destructive power of nuclear weapons promotes strategic stability, therefore, it reduces the chances of full-scale war. However, nuclear weapons increase the probability of low-intensity conflict or limited war. Glenn also explained that due to the "objective existence of the probability of [nuclear] retaliation," the Soviets could engage in trivial military adventures with "impunity" because of the stability-instability paradox.[194] The massive retaliation doctrine was first hastily qualified in January 1954 by Dulles and later shelved in April 1954, when in an article in *Foreign Affairs*, Dulles wrote, "massive atomic and thermonuclear retaliation is not the kind of power which could most usefully be evoked under all circumstances," because of their immense destructive power and "if there is a Communist attack somewhere in Asia, atom or hydrogen bombs will necessarily be dropped on the great industrial centers of China or Russia."[195] The doctrine was rolled back in April 1954 because it seemed to lack credibility to deter the USSR because the nuclear inventory of the USSR was enough to offset the numerical advantage the US had. In 1954, the US had 1703 nuclear warheads, whereas USSR had 150

[192] Robert D. Kaplan, Why John J. Mearsheimer Is Right (About Some Things). *The Atlantic*, January/February 2012, accessed May 28, 2021, https://www.theatlantic.com/magazine/archive/2012/01/why-john-j-mearsheimer-is-right-about-some-things/308839/

[193] Michael Krepon, "The Stability-Instability Paradox, Misperception, and Escalation Control in South Asia" in Michael Krepon, Rodney W. Jones, and Ziad Haider eds. *Escalation Control and the Nuclear Option in South Asia,* (Washington, D.C.: The Henry L. Stimson Center, 2004), 1

[194] Glenn Snyder, *Deterrence and Defense* (Princeton: Princeton University Press, 1961), 226

[195] John Foster Dulles, "Policy for Security and Peace," *Foreign Affairs*, April 1954, accessed May 2, 2018, https://www.foreignaffairs.com/articles/united-states/1954-04-01/policy-security-and-peace

warheads.[196] Though the doctrine of massive retaliation gave way to *flexible response* (dubbed 'limited warfighting') in 1954 (discussed below as part of the second wave of deterrence theory), the underlying precepts of the stability-instability paradox remained unaltered. This appears to be the underlying reason for the US and USSR's massive nuclear and conventional arms buildup during the Cold War. In 1986, the US had 23,317, and the USSR had 45,000 nuclear warheads.[197]

The work of the first wave nuclear deterrence theorists had a strong influence on the work produced by later generations of theorists. It is because of this impact that Sir Lawrence Freedman wrote in 2014 that "once deterrence became doctrine, then it was elevated to the status of a general theory of strategic relationships, and was defended and attacked on that basis."[198] The first wave was superseded in the early 1950s by the second wave, which made the theory more comprehensive and broadened its spectrum.

1.6.2.2 The Second Wave of Nuclear Deterrence Theory

The second wave lasted for over twenty years, extending into the early 1970s. Since the second wave emerged in the Cold War, during a bipolar confrontation, nuclear deterrence also evolved as a policy of foreign policy. New theoretical developments led to the development of new concepts and incorporated new methods of analysis, such as game theory and the prisoner's dilemma, as the more meticulous analysis was applied.

During the second wave, events such as the Korean War, the Vietnam War, and most significantly, the Cuban Missile Crisis took place, which provided a real-time situation for nuclear deterrence theorists to evaluate strategic and crisis stability and to reflect on how despite their best efforts they could easily lose control of a situation. During this period, both superpowers achieved secure second-strike capabilities. This led Robert McNamara, then US Secretary of Defense, to use the term Mutually Assured Destruction (MAD) in 1967 to define superpower strategic rivalry at the nuclear level.[199] The term was coined by Donald Brennan in 1962.[200] MAD has many interpretations, a situation or

[196] Hans M. Kristensen and Robert S. Norris, "Global nuclear weapons inventories," 1945–2010, *Bulletin of the Atomic Scientists*, Vol. 66, No. 4, (2013) 81
[197] Ibid
[198] Lawrence Freedman, *Deterrence* (Cambridge: Polity Press, 2004), 15
[199] "Mutual Deterrence" Speech by Secretary of Defense Robert McNamara, Atomic Archives, September 18, 1967, accessed December 7, 2021, https://www.atomicarchive.com/resources/documents/deterrence/mcnamara-deterrence.html
[200] Robert Jervis, "The Dustbin of History: Mutual Assured Destruction," *Foreign Policy*, November 9. 2009, accessed December 7, 2021, https://foreignpolicy.com/2009/11/09/the-dustbin-of-history-mutual-assured-destruction/

outcome of effective parity, a capability, a broader framework that allowed the Cold War superpowers to manage their relationship. MAD essentially means that the full-scale use of high-yield nuclear weapons by opposing sides would effectively result in the complete, utter and irrevocable annihilation of both the attacker and the defender. According to McNamara, it was important to maintain "a highly reliable ability to inflict unacceptable damage upon any single aggressor or combination of aggressors at any time during a strategic nuclear exchange, even after absorbing a surprise first strike. This can be defined as our assured-destruction capability."[201] With MAD in place, it came to be the new accepted basis for stable nuclear relationships among the superpowers.

With MAD in place, the cost of aggressive moves was potentially so high that extreme competitive risk-taking was no longer a feasible option because even the slightest mistake might escalate into mutual destruction. Moreover, it provides insight into questions related to alliances under MAD and the practice of *extended deterrence* – where one state extends its nuclear umbrella over its allies and promises to defend them, including via the use of nuclear weapons, should they be threatened or attacked by another state.

The Second Wave: Deepening and Broadening Nuclear Deterrence Theory

In nuclear deterrence theory, a state is both the subject and object of investigation as a rational actor. The underlying logic of nuclear deterrence, thus, is determined through the inquiry into the state's rational decision carried out in relation to nuclear weapons.[202] Among the second wave theorists, the fundamental theoretical issue revolves around credibility associated with the rational use of nuclear threats to preserve deterrence and yet avoid the destruction that nuclear weapons are supposed to bring. According to some international relations scholars, deterrence is based on 3Cs: communication, capability, and credibility.[203] Patrick Morgan defines deterrence as "the threat of military retaliation to forestall a military attack."[204] According to Alexander George and Richard Smoke, it requires *convincing* the adversary that the perceived cost of any action will outweigh the perceived gains.[205] For Morgan, *convincing* means to "...penetrate and manipulate the

[201] "Mutual Deterrence" Speech by Sec. of Defense Robert McNamara, San Francisco, September 18, 1967, accessed April 24, 2018, http://www.atomicarchive.com/Docs/Deterrence/Deterrence.shtml
[202] Phillip Green, *Deadly Logic: The Theory of Nuclear Deterrence* (Columbus: Ohio State University Press, 1966); Stephen Maxwell, *Rationality in Deterrence*, (London: IISS Adelphi Paper, 1968)
[203] John Baylis, Ken Booth, John Garnet and Phil Williams, *Contemporary Strategy: Theories and Concepts* (London: Croom Helm, 1987), 70-75
[204] Patrick M. Morgan, *Deterrence: A Conceptual Analysis*, (London: Sage Publications, 1983), 29
[205] Alexander George and Richard Smoke, *Deterrence in American Foreign Policy: Theory and Practice*, (New York: Columbia University Press, 1974), 11

thought processes of the opposing leaders so that they draw the *proper* conclusion about the utility of attacking."[206] For Thomas Schelling, deterrence is based on the threat based on a futuristic premise when he states that "it is the threat of damage or of more damage to come that can make someone yield or comply."[207]

Glenn Snyder views deterrence as a negative aspect of political power. Glenn defines political power as "the capacity to induce others to do things or not to do things which they would not otherwise do or refrain from doing."[208] Therefore, for Glenn, the negative aspect of political power is "the power to dissuade another party from doing something which one believes to be against one's interests, achieved by the threat of applying some sanction."[209] Moreover, he writes that deterrence does not have to depend on the capability to threaten or inflict punishment. Deterrence, according to Glenn, "may also be achieved by having the capability to deny the other party any gains from the move which is to be deterred."[210] In other words, the state's objectives can be achieved by deterrence by denial and/or deterrence by punishment.[211] *Deterrence by denial* means to deny the perceived benefits an action is expected to provide to an adversary. Both offensive and defensive weapons can be key components in this, but the defense plays a key role as it can prevent an attacker's attack from succeeding, and thus prevent an attacker from striking out in the first place; defense deters the other's offensive strike. *Deterrence by punishment* means that victory for the attacker will be denied as punishment – destruction – will be inflicted upon the adversary via retaliation. Apart from military means, Glenn writes that an adversary may also be deterred through incentives/inducements via non-military means, such as imposing restrictions on trade and investment and economic sanctions, or by promising economic aid and financial loans (and the removal of sanctions).[212]

Deterrence also has a psychological aspect, which is extremely important. The psychological school of thought of nuclear deterrence theory was part of the second wave of deterrence theorizing in the late 1960s and 1970s. It suggested that *signaling* was

[206] Patrick M. Morgan, "Saving Face for the Sake of Deterrence," in eds. Robert Jervis, Richard Ned Lebow and Janice Gross Stein, *Psychology and Deterrence* (Baltimore: John Hopkins University Press, 1985), 125
[207] Thomas Schelling, *Arms and Influence* (New Haven: CT, Yale University Press, 1966), 2
[208] Glenn H. Snyder, Deterrence and Power, *The Journal of Conflict Resolution*, Vol. 4, No. 2, (1960) 163
[209] Ibid
[210] Ibid
[211] Glenn H. Snyder, *Deterrence and Defense: Toward a Theory of National Security* (Princeton: Princeton University Press, 1961), 3-15
[212] Schelling, *Arms and Influence*, 163

important to nuclear deterrence. It held that the state's acquisition of capabilities to punish, actions to inflict punishment, and the demonstration of the will to do so were the way to signal adversaries to take their deterrent threats seriously. Such signaling creates a peculiar relation of perception and misperception between both a deterrer and a deterree, which plays a vital role in determining whether a threat is credible.[213] As Jervis writes, "in the most elementary sense, deterrence depends on perceptions."[214] However, when push comes to shove, nuclear war among nuclear weapons states is a possibility.[215] It is essential to mention here that deterrence is distinguished from compellance. Both deterrence and compellance are part of coercive diplomacy, which itself is different from pure coercion, wherein the use of *brute force* is preferred to compel/repel the adversary.[216] The underlying assumption of deterrence and compellance relies on the threat to use force, motivating the adversary to submit to the will of the coercer, but they vary in their approach to threat-making. In deterrence, the adversary is threatened to ensure they refrain from taking a particular action, whereas, in compellance, the adversary is threatened to encourage them to undertake a particular action or stop the action in progress.[217] However, such differences between deterrence and compellance are only prominently mentioned in the US and western literature on deterrence. In China, deterrence is *equated* with compellance, which brings a different understanding of the policy altogether, and therefore, to its practice. A detailed discussion on the differences between the Chinese and the US/western approaches is presented later in this chapter.

During the second wave of deterrence, distinctions were made between *immediate deterrence*, also known as minimum deterrence, and *general deterrence*, also known as existential deterrence.[218] General deterrence relies on persistent efforts to maintain the existing balance of power to prevent the adversary from posing a military threat during peacetime and into the foreseeable future. Immediate deterrence is a sudden short-term

[213] Robert Jervis, *Perception and Misperception in International Politics* (Princeton: Princeton University Press, 1976); Robert Jervis, "Deterrence and Perception," *International Security*, Vol. 7, No. 3, (Winter 1982-83), 3-30
[214] Ibid., 3
[215] Roy E. Jones, *Nuclear Deterrence: A Short Political* Analysis (London: Routledge and Kegan Paul, 1968), 20
[216] Thomas Schelling, *Arms and Influence* (New Haven: CT, Yale University Press, 1966), 3
[217] Lawrence Freedman, "Strategic coercion," in Lawrence Freedman, ed. *Strategic Coercion: Concepts and Cases* . (New York: Oxford University Press, 1998), 15-36
[218] Patrick Morgan, *Deterrence: A Conceptual Analysis* (Beverly Hills, CA, 1977), 28-30; Lawrence Freedman, "General Deterrence and the Balance of Power," *Review of International Studies*, Vol. 15, No. 2, (1989), 199-210; Richard Ned Lebow and Janice Gross Stein, "Beyond Deterrence," *Journal of Social Issues*, Vol. 43, No. 4, (1987), 8; Paul Huth and Bruce Russett, "Deterrence Failure and Crisis Escalation," *International Studies Quarterly*, Vol. 32, No. 1, (1988), 30.

effort to prevent the adversary from attacking in a crisis by making retaliation plausible.[219] When general deterrence fails or requires more explicit support, immediate deterrence comes into play. General deterrence is preventive, whereas immediate deterrence has a pre-emptive objective. A change from general to immediate deterrence reflects that a state has a *revisionist* objective and that it is willing to challenge the existing *status-quo* by resorting to the use of force.

Finally, towards the end of the second wave, the Anti-Ballistic Missile (ABM) Treaty entered into force in October 1972. The treaty was aimed at creating stability at the strategic level between the US and the USSR (for structural cohesion, this is examined in more detail in the next section after the 1962 Cuban Missile Crisis is considered) and it was part of a suite of strategic arms control agreements. The second wave ended in the early 1970s.

1.6.2.3 The Third Wave of Nuclear Deterrence Theory

The second wave of nuclear deterrence theory had shortcomings in three critical areas, which third wave theorists later addressed. The shortcomings were associated with a lack of supporting evidence, the undefined relation between deterrence and politics, and the cost of the retreat. Jervis divided the cost of retreat into three broad categories; *intrinsic interest, strategic interest*, and *commitment*. He argued that the second wave theorists emphasized strategic interests and commitment, whereas third wave theorists argued that *intrinsic interest* is more important in most cases.[220] Jervis writes,

> Intrinsic interest represents the inherent value that the actor places on the object or issue at stake. For example, if the United States had allowed the Soviet Union to occupy all of Berlin, two million people would have been forced to live under a regime that they abhor. Strategic interest in a conflict represents the degree to which a retreat would endanger the state's position on other issues, irrespective of its efforts to commit itself to a firm stand. Thus, even in the absence of a commitment, a retreat from Berlin could have led America's allies and adversaries to expect concessions on related issues and retreats under similar circumstances. Both intrinsic and strategic interests precede the bargaining process. Commitment, the third

[219] Paul Huth and Bruce Russett, "Deterrence Failure and Crisis Escalation," *International Studies Quarterly*, Vol. 32, No. 1, (1988), 30; Freedman, *Deterrence*, 40–42; Richard Ned Lebow and Janice Gross Stein, "Deterrence: The Elusive Dependent Variable," *World Politics*, Vol. 42, No. 3, (1990), 336, 342; Jack S. Levy, "When Do Deterrent Threats Work?" *British Journal of Political Science*, Vol. 18, No. 4, (1988), 485-512; and Paul Huth, "Deterrence and International Conflict: Empirical Findings and Theoretical Debates," *Annual Review of Political Science*, Vol. 2, (1999), 27-28

[220] Robert Jervis, "Deterrence Theory Revisited, (Reviewed Work: Deterrence in American Foreign Policy: Theory and Practice by Alexander George and Richard Smoke)" *World Politics*, Vol. 31, No. 2, (1979), 289-324

> value sacrificed by a retreat, is manipulated by the state to increase its costs of retreating and thereby improve its bargaining position.[221]

The third wave of nuclear deterrence emerged out of real-world events with Alexander George and Richard Smoke's seminal work, *Deterrence in American Foreign Policy*, published in 1974, starting the new wave of theorizing.[222] George and Smoke carried out a comparative analysis of the case studies from 1948 to 1961 in the US foreign policy, involving conventional and nuclear deterrence relevant to deterrence theory.

Richard Lebow and Janice Gross Stein analyzed the Cuban Missile Crisis to illustrate how a series of activities carried out by the US, including the insertion of nuclear missiles into Turkey to increase the credibility of general deterrence from the US viewpoint, proved counter-productive and led the Soviet Union to respond by deploying nuclear weapons in Cuba.[223] What appeared to Washington be a way by which to strengthen deterrence to the US was viewed by the Soviets as inherently destabilizing, necessitating Soviet efforts to 'restore' deterrence by placing tactical nuclear missiles in Cuba, which in turn was viewed as destabilizing by the US. The US and Soviets had different views over whether their 'rational' actions were stabilizing – what was stabilizing to one was judged to be destabilizing to the other, hence leading to a crisis over Cuba that neither wanted and that both struggled to extricate themselves from once it was underway.

Francis Gavin writes that in February 1963, McGeorge Bundy, the then National Security Advisor (NSA), in a meeting to discuss US nuclear policy towards Russia at the White House, stated that in "the most serious way, he felt there was really no logic whatever to nuclear policy (flexible response)."[224] Essentially, after fifty years of the arrival of nuclear weapons, Bundy, who had served as NSA to President John Kennedy and Lyndon Johnson, explained that during the Cuban Missile Crisis, leaders were still uncertain about the role of nuclear deterrence in crisis escalation. Indeed, it appeared they did not guarantee crisis stability. [225] He writes, "in none of the three [Suez, Berlin and Cuba] cases,

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[221] Ibid

[222] Alexander George and Richard Smoke, *Deterrence and American Foreign Policy: Theory and Practice* (Columbia: Columbia University Press, 1974)

[223] Richard Ned Lebow and Janice Gross Stein, "Deterrence and the Cold War," *Political Science Quarterly*, Vol. 110, No. 2, (1995), 162-163. A detailed discussion on the Cuban Missile Crisis has already been made above; however, for a more detailed account of Robert McNamara on CMC please watch the documentary by Errol Morris, 'The Fog of War: Eleven Lessons from the Life of Robert S. McNamara, accessed July 13, 2019, https://archive.org/details/TheFogOfWarElevenLessonsFromTheLifeOfRobertS.Mcnamara

[224] Francis J. Gavin, "The Myth of Flexible Response: United States Strategy in Europe during the 1960s, " *The International History Review*, Vol. 23, No. 4, (2001), 849

[225] McGeorge Bundy, "To Cap the Volcano," *Foreign Affairs*, Vol. 48, No. 1, (October, 1969), 1-20

I feel confident, would the final result have been different if the relative strategic positions of the Soviet Union and the United States had been reversed. A stalemate is a stalemate either way around."[226]

During the third wave, Richard Betts analyzed what he calls *lower-risk* nuclear use cases, such as the Berlin blockade of 1948 and the Korean War (1950-1953), and *higher-risk* cases of nuclear use, such as the Cuban Missile Crisis of 1962.[227] He writes that "the nature of the evidence precludes conclusion about whether peace was maintained because of nuclear threats in spite of them-or about how much impact the hints of blackmail had either way."[228] He concluded that it is hard to measure the effectiveness of nuclear threats.[229] The third wave theorists also appeared critical of nuclear warfighting strategies which had been championed by some US scholars and officials (the idea that nuclear forces should be constructed in a way to allow the US to fight and win a nuclear war if necessary, and that this capability itself would be the best way to deter the Soviet Union from initiating a war in the first place), calling them profoundly flawed and illogical and associating them with what Clausewitz called *war by algebra*.[230]

The idea for a nuclear non-proliferation regime, which led to the construction of the nuclear world order, also emerged during the third wave of nuclear deterrence. Given the nature of nuclear weapons and the belief that conflict is inherent in international relations, nuclear-weapon states believed nuclear weapons proliferation was inevitable as long as there was no fundamental arrangement to limit the horizontal proliferation of nuclear weapons. This led to the creation of the Nuclear Non-proliferation Treaty (NPT), which entered into force in 1970. This divided the world into nuclear weapons states (NSA) and non-nuclear weapons states (NNWS), often termed *nuclear haves* and *nuclear have-nots*.[231]

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[226] Ibid, 11
[227] Richard K. Betts, *Nuclear Blackmail and Nuclear Balance*, (Washington, DC: The Brookings Institution, 1987)
[228] Ibid., 132
[229] Ibid
[230] Robert Jervis, *The Illogic of American Nuclear Strategy* (London: Cornell University Press, 1984); Desmond Ball, *Can Nuclear War be Controlled*? Adelphi Paper, No. 169 (London: International Institute of Strategic Studies, 1981); Harrison R. Wagner, "Nuclear Deterrence, Counterforce Strategies, and the Incentive to Strike First," *American Political Science Review*, Vol. 85, No. 3, (September 1991), 727-749; Stephen J. Cimbala, "Deterrence and Friction: Implications for Missile Defense," *Defense & Security Analysis*, Vol. 18, No. 3, (2002) 201-220; For similar discussion also see Solly Zuckerman, *Nuclear Illusion and Reality*, (New York: Vintage, 1982)
[231] Jeffrey W. Knopf, "Nuclear Disarmament and Nonproliferation: Examining the Linkage Argument," *International Security*, Vol. 37, No. 3, (2012), 92-132; Sara Z. Kutchesfahani, "The NPT at 50: A Staple

Similarly, the ABM treaty was designed to bring strategic stability and limit the nuclear arms race. Both the US and the Soviet Union agreed through this treaty that limiting defensive systems would limit the requirement for more or new offensive weapons systems; if defenses were deployed, the other state would feel compelled to massively increase its offensive missiles to overwhelm them. The treaty prohibited the US and Soviet Union from:

a) developing "missile defenses that can protect all U.S. or Soviet/Russian territory against strategic ballistic missiles";

b) "establishing a base for a nationwide defense against strategic ballistic missiles";

c) the "development, testing, or deployment of the sea-, air-, space-, or mobile land-based ABM systems or components";

d) "development, testing, or deployment of strategic missile interceptor launchers that can fire more than one interceptor at a time or are capable of rapid reload";

e) "upgrading existing non-ABM missiles, launchers, or radars to have ABM capabilities and testing existing missiles, launchers, or radars in an ABM mode";

f) "deployment of radars capable of early warning of strategic ballistic missile attack anywhere other than on the periphery of U.S. or Soviet/Russian territory and oriented outward";

g) "deployment of ABM radars capable of tracking and discriminating incoming strategic targets and guiding defensive interceptors, except within a 150-kilometer radius of the one permitted defense"; and

h) "transfer or deployment of ABM systems or components outside U.S. and Soviet/Russian territory."[232]

The idea behind the treaty was that the mutual vulnerability to each other's nuclear weapons, without missile defenses, would strengthen deterrence and reduce pressures on

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of Global Nuclear Order," *Arms Control Association*, June 2018, accessed December 8, 2021, https://www.armscontrol.org/act/2018-06/features/npt-50-staple-global-nuclear-order; Arms Control Association, Timeline of the Treaty on the Non-Proliferation of Nuclear Weapons (NPT), May 25, 2015, accessed December 8, 2021, https://www.armscontrol.org/factsheets/Timeline-of-the-Treaty-on-the-Non-Proliferation-of-Nuclear-Weapons-NPT

[232] Daryl Kimball, "The Anti-Ballistic Missile (ABM) Treaty at a Glance," *Arms Control Association*, December 2020, accessed July 15, 2021, https://www.armscontrol.org/factsheets/abmtreaty

each side to carry out a first strike because a retaliatory strike would lead to its own assured destruction.

The limited spread of nuclear weapons throughout the Cold War (at least relative to initial expectations that they would quickly spread) and its deterrent power led to the establishment of what Gaddis called the *Long Peace* (the title of his 1989 book), wherein there was no direct and significant war among the superpowers.[233] However, with the end of the Cold War, the bipolar strategic competition came to an end, and according to John Ikenberry, Michael Mastanduno and Wohlforth, "the end of the cold war did not return the world to multipolarity. Instead, the United States – already materially preeminent – became more so."[234] Some even spoke about a 'unipolar moment.'[235] However, some analysts argued unipolarity was not real, it was an "illusion," or a "moment," which "will not last long," and by the late 1990s it was already "giving way to multipolarity."[236]

The terror attacks by Al-Qaeda against the US on September 11, 2001, shattered the US unipolar moment. It highlighted the importance of emerging and newly-empowered non-state actors, such as transnational terrorist organizations, non-governmental organizations (NGOs), and multinational corporations (MNCs). The terrorist attacks of 9/11 revealed a failure to identify and address emerging global threats. Arguably, the Bush administration still maintained the Cold War era state-centric lens when viewing the global security environment.[237] This realization led to the emergence of the fourth wave of deterrence theory.

1.6.2.4 The Fourth Wave of Deterrence Theory

The fourth wave of deterrence theory emerged after Al Qaeda, a non-state actor, attacked the US. Since non-state actors lack the primary characteristic of statehood, this new wave sought to update scholarship and policy to adapt to the 'new' strategic reality and the

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[233] John Lewis Gaddis makes this case in *The Long Peace: Inquiries into the History of the Cold War* (USA: Oxford University Press, 1989)

[234] G. John Ikenberry , Michael Mastanduno and William C. Wohlforth, *International Relations Theory and the Consequences of Unipolarity* (Cambridge: Cambridge University Press, 2011), 1

[235] 1. Charles Krauthammer, "The Unipolar Moment," *Foreign Affairs*, Vol. 70, No. 1 (Winter 1990/1991), 23-33.

[236] The international system appears unipolar, though it is incipiently multipolar; Glenn H. Snyder, *Alliance Politics* (Ithaca, N.Y.: Cornell University Press, 1997), 18: Charles A. Kupchan, "Rethinking Europe," *National Interest*, No. 56 (1999); Kupchan, "After Pax Americana: Benign Power, Regional Integration, and the Sources of Stable Multipolarity," *International Security*, Vol. 23, No. 3, (1998), 41; Christopher Layne, "The Unipolar Illusion: Why New Great Powers Will Arise," *International Security*, Vol. 17, (Spring 1993), No. 4, 5-51

[237] Robert Patman, "Out of sync: Bush's expanded national security state and the war on terror, *International Politics*," Vol. 46, No. 2-3, (2009) 210-233

threats it contained. The 9/11 attacks prompted a significant change in the declaratory strategy of the US. The *Bush Doctrine* was announced by President George W. Bush which entailed a strategy of pre-emption and prevention.[238]

Apart from the new preventive/pre-emptive strategies, Bush and the Neo-Conservatives – a group of assertive nationalists who believed the use of military force (unilaterally if necessary) abroad in service of spreading democracy was legitimate and necessary – in Washington introduced new strategic concepts. The National Security Strategy (NSS) of 2002 introduced the concept of *dissuasion* to address new challenges.[239] Dissuasion is a strategy that includes "actions taken to increase the target's perception of the anticipated costs and/or decrease its perception of the likely benefits from developing, expanding, or transferring a military capability that would be threatening or otherwise undesirable."[240] In short, dissuasion is a form of 'pre-deterrence' wherein it seeks to discourage states from achieving a particular type of military capabilities in the first place. Dissuasion, if successful, obviates the need for deterrence to be practiced at all.[241]

According to the NSS document, dissuasion appeared to be a strategy to complement deterrence. It presented a seemingly credible concept to handle emerging geo-political and strategic situations involving countries falling short of *open* rivalry, constraining the options for potential adversaries without provoking them. It required adaptation and transformation in defense missions at home and abroad, military capabilities, and alliance formations. The dissuasion strategy of the US would bring non-state actors, rogue states, and other sub-state actors or entities aiding and abetting terrorist groups under the ambit of deterrence strategy. Therefore, dissuasion, if successful would prevent the need to practice deterrence in the first place. Hence, it attempted to make deterrence more robust to preserve US' primacy.

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[238] Colin S. Gray, "The Implications of Pre-emptive and Preventive War Doctrines: A Reconsideration," U.S. Army War College Monograph, July 2007, accessed July 20, 2019, http://www.strategicstudiesinstitute.army.mil/pdffiles/pub789.pdf; also see David Alan Rosenberg, "U.S. Nuclear War Planning, 1945-1960 in Desmond Ball and Jeffrey Richelson (eds.), *Strategic Nuclear Targeting* (New York: Ithaca Publishing, 1986), 44

[239] US National Security Strategy 2002, accessed July 20, 2019, https://georgewbush-whitehouse.archives.gov/nsc/nss/2002/ for more discussion of dissuasion see Ryan Henry, Principal Deputy Under Secretary of Defense, briefing, "Deterrence and Dissuasion for the 21st Century," *Institute for Foreign Policy Analysis–Fletcher Conference*, December 14, 2005, accessed July 20, 2019, https://slideplayer.com/slide/4390310/

[240] Andrew F. Krepinevich and Robert C. Martinage, Dissuasion Strategy, 2008, accessed July 16, 2019, *Center for Strategic and Budgetary Assessments*, https://csbaonline.org/uploads/documents/2008.05.06-Dissuasion-Strategy.pdf

[241] Ibid

This new and broader approach to deterrence identified a new role for deterrence against rogue states and non-state actors. This uniqueness of the fourth wave compelled seasoned deterrence theorists such as Sir Lawrence Freedman, Patrick Morgan, Michael Quinlan, and Alexander George to return and address the new complexities of the strategic environment and how deterrence related to it.[242] There was a consensus among them that deterrence was still viable but may not be fool proof, as deterring state-centric threats is easier than deterring non-state actors and possibly rogue states that may not be entirely rational. Therefore, the focus remained on states (rogue) specifically concerning the handling of weapons of mass destruction (WMDs) and dirty bombs (crude nuclear devices) and their possible (willingly or unwillingly) transfer to non-state actors. Jeffrey Knopf highlighted the significance of nuclear forensics to deter a potential nuclear threat. He proposed to establish attribution capabilities in the wake of a WMD or nuclear attack, such as identifying the source of the materials, presumably linking them back to the capabilities of a state actor. A successful attribution capability could, in theory, help achieve deterrence against nuclear terrorism because complicit actors would be found out and punished in the wake of an attack.[243] This would reduce their desire to be the source for materials that could be used in an attack, even by third-party terrorists.

One other unique aspect of the fourth wave is that it emphasizes incorporating non-military means, such as economic and financial embargos, as deterrence. The scholars of the fourth wave differed over the use of deterrence strategy and whether it should prioritize deterrence by denial or deterrence by punishment. Most scholars asserted that deterrence by denial should be prioritized over deterrence by retaliation because of the change in nature of the threat emanating from non-state actors or the proliferation of new capabilities, such as WMD capabilities and radioactive materials.[244] There is consensus among the fourth wave scholars that a similar deterrence approach or strategy to that of the Cold War should not be applied to every case and threat, given their differences, and

[242] Freedman, *Deterrence*; Morgan, *Deterrence Now*; Michael Quinlin, "Deterrence and Deterrability," *Contemporary Security Policy*, Vol. 25, No. 1, (2003), 11-17; George and Smoke, *Deterrence in American Foreign Policy*

[243] Michael Miller, "Nuclear Attribution as Deterrence", *Nonproliferation Review*, Vol. 14, No. 1 (2007); Michael A. Levi, "Deterring Nuclear Terrorism", *Issues in Science and Technology* (Spring 2004), accessed July 27, 2019 www.issues.org/20.3/levi.html; also see Graham Allison, "How to Stop Nuclear Terror," *Foreign Affairs*, Vol. 83, No. 1, (2004) 64-74; Graham Allison, "Nuclear Accountability," *MIT Technology Review* July 2005, accessed July 27, 2019, https://www.technologyreview.com/s/404373/nuclear-accountability/; Graham Allison, "A Response to Nuclear Terrorism Skeptics," *The Brown Journal of World Affairs*, Vol. 16, No. 1, (2009) 31-44

[244] Jeffery W. Knopf, "Wrestling with Deterrence: Bush Administration Strategy after 9/11," *Contemporary Security Policy*, Vol. 29, No. 2, (August 2008), 48-252

therefore the concept of *tailored deterrence* was introduced.[245] In this, deterrence may be tailored according to the needs of the deterrer, the capabilities required to execute a specific strategy, and the specific scenarios with opportunities to deter an adversary.[246] According to Elaine Bunn, tailored deterrence has three dimensions; a) tailoring to specific actors and situations' b) tailoring capabilities; and c) tailoring the credibility of intent and communications to deter specific actors are critical to tailoring deterrence.[247] Inherently, the fourth wave of deterrence, like the first wave, was informal and abstract. It was the product of real-world incidents but lacked empirical testing. It seeks to provide justifications for, and outline the continued utility of, deterrence while updating it for a new age. Since it was the by-product of the 9/11 attacks when the world was essentially unipolar, it was highly US-centric. To make deterrence exceedingly credible and deterrence threats more viable, out of fear of failure of deterrence, some scholars supported missile defense deployments.[248] Scholars in favor of the deployment of missile defense systems argued that deployments would address the problem of asymmetric threats both from states and non-state actors, including the threat from the nexus of *rogue* states with non-state actors (at the sub-state level).[249] In a unipolar setting, the US military, economic and technological power was unmatched. The bipolar power balance, which existed during the Cold War, had shifted to favor the US decisively. This shift also destabilized the mutual deterrence of the Cold War in favor of the US. It led to the creation of what is known as the New World Order spearheaded by the US. The change in the global distribution of power because of the collapse of the USSR, the rise in US national power relative to every other state, and the emergence of potent non-state actors generated a requirement for a new understanding of deterrence. As Knopf notes, the US sought capabilities, such as missile defenses, for deterrence that denied others (rogue states) the ability to deter the US from taking any action unilaterally.

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[245] Elaine M. Bunn, "Can Deterrence be Tailored?" *Strategic Forum*, No. 225, (January 2007), 1-8

[246] Dennis Blair, "Annual Threat Assessment of the US Intelligence Community for the Senate Select Committee on Intelligence," *Director of National Intelligence*, February 2, 2010, accessed December 8, 2021, http://www.dni.gov/testimonies/20100202_testimony.pdf.

[247] Elaine Bunn, "Can Deterrence be Tailored?"; Karl-Heinz Kamp and David S. Yost, *NATO and 21st Century Deterrence*, (Rome: NATO Defense College, May 2009), 11-58; Barry R. Schneider and Patrick D. Ellis eds. *Tailored Deterrence: Influencing States and Groups of Concern* (Alabama: Maxwell Air Force Base, 2011)

[248] Keith Payne, *Deterrence in the Second Nuclear Age* (Kentucky: University Press of Kentucky, 1996); Colin S. Gray, *The Second Nuclear Age* (Colorado: Lynne Rienner Publishers, 1999)

[249] Ibid

Fourth wave deterrence theorists recognize that deterrence (including against terrorism) is an outcome of actors' comparison of the perceived utility in attacking or not. In order to bolster deterrence, an increase in alternatives such as diplomacy could also help reduce the incentive for conflict. The fourth wave led to the return of deterrence as a concept with more force in US security thinking and now being designed to encompass a broader number of actors. Apart from the theory of deterrence, some key concepts are also used in the thesis to develop a better understanding of the scholarship. These key concepts are examined in the section below.

1.7 Key Concepts

Key concepts utilized in this chapter and referred to/applied throughout subsequent chapters are crisis stability, structural stability, crisis escalation, arms race, and extended deterrence. *Crisis stability*, according to Charles Glaser, "is a measure of the countries' incentives not to pre-empt in a crisis, that is, not to attack first in order to beat the attack of the enemy."[250] Crisis stability is achieved when a condition of stable mutual deterrence is achieved and sustained. *Structural stability* refers to a situation where pre-existing conditions such as the global distribution of power lead to strategic balance, therefore, there is a low likelihood of a crisis occurring.[251] The tangible conditions that ensure this may include, but are not limited to, the nature of the terrain, size, composition, and force structures of both sides and their warfighting doctrines and strategies.[252] On the other hand, *crisis escalation* is a situation during a crisis when crisis stability fails, and adversaries try to gain a military advantage over each other or escape defeat via military means. In the nuclear realm, involving nuclear-capable adversaries, crisis instability and escalation could have existential consequences for all sides.

The crisis stability in the deterrent relationship depends upon maintaining a sufficiency of military preparation, which may lead to an arms race. The arms race involves two or more states perceiving themselves as adversaries and involved in a cycle of qualitative or

[250] Charles L. Glaser, *Analysing Strategic Nuclear Policy* (Princeton, N.J.: Princeton University Press, 1990), 45

[251] Robert Axelrod, "The Concept of Stability in the Context of Conventional War in Europe," *Journal of Peace Research*, Vol. 27, No. 3 (August 1990), 247-4

[252] Robert J. Powell, "Crisis Stability in the Nuclear Age," *American Political Science Review*, Vol. 83, No. 1 (1989); Thomas C. Schelling, *Arms and Influence* (New Haven, Conn.: Yale University Press, 1966) 244–245; Laurence S. Seidman, "Crisis Stability," *Journal of Conflict Resolution*, Vol. 34, No. 1, March 1990; Stephen van Evera, "Offense, Defense, and the Causes of War," *International Security*, Vol. 22, No. 4, (1998) 6.

quantitative improvements of their arms, keeping in mind the past, present and anticipated political and military conduct of their perceived adversary while forming their military doctrines and postures.[253]

Extended deterrence occurs when a state (defender) strives to dissuade a third party (state) from attacking an ally by deterring/intimidating the third party that the gains from military conflict will be denied or they will be defeated. Nuclear extended deterrence, therefore, is a situation wherein a defender uses the threat of the use of nuclear weapons against a third party or convinces a potential adversary that any military effort would be futile, given the risk of nuclear annihilation.[254]

A credibility issue lies at the heart of extended deterrence as the defender must assure the adversary of its credibility and resolve to defend its ally. For instance, Dr. Jamie Shea, Deputy Assistant Secretary-General for Emerging Security Challenges, North Atlantic Treaty Organization (NATO), stated that Dwight D. Eisenhower once said, "in the defense of the United States itself we will certainly use nuclear weapons, but to use them in another situation might prove very difficult."[255] Henry Kissinger, while expressing the same concern, said, "no US president would ever risk the safety of the housewife in Kansas to protect the housewife in Hamburg."[256] The French president and former general, Charles de Gaulle, while expressing fear and pessimism, asked President John F. Kennedy "whether he [Kennedy] would be ready to trade New York for Paris."[257] However, Thomas Schelling writes that the US would certainly fight [a nuclear war] to defend California.[258] The concept of extended deterrence is applied to the contemporary

[253] Colin S. Gray, "The Arms Race Phenomenon," *World Politics*, Vol. 24, No. 1 (1971), 40; Samuel P. Huntington, "Arms Races: Pre-Requisites and Results," in Carl S. Friedrich and Seymour E. Harris, eds., *Public Policy*, (Cambridge, Mass.: Graduate School of Public Administration, Harvard University. 1958), 4I; Arthur L. Burns, "A Graphical Approach to Some Problems of the Arms Race," *The Journal of Conflict Resolution*, III (December 1959), 326

[254] Paul K. Huth, "The Extended Deterrent Value of Nuclear Weapons," *Journal of Conflict Resolution*, Vol. 34, No. 2, (1990), 270-90; see also Matthew Fuhrmann and Todd S. Sechser, "Signaling Alliance Commitments: Hand-Tying and Sunk Costs in Extended Nuclear Deterrence," *American Journal of Political Science*, Vol. 58, No. 4, (2014), 919-935; Francis J. Gavin, "Strategies of Inhibition: Grand Strategy, the Nuclear Revolution, and Nonproliferation," *International Security*, Vol. 40, No. 1, (2015) 9-46

[255] Dr Jamie Shea, 1967: De Gaulle pulls France out of NATO's integrated military structure, (Video Lecture) March 3, 2009, Last updated December 12, 2016, accessed September 23, 2020, https://www.nato.int/cps/en/natohq/opinions_139272.htm

[256] Ibid

[257] Memorandum of Conversation, Foreign Relations of the United States, 1961–1963, VOLUME XIV, BERLIN CRISIS, 1961–1962, May 31, 1961, accessed September 23, 2020, https://history.state.gov/historicaldocuments/frus1961-63v14/d30

[258] Schelling, *Arms and Influence*, 35

situation involving the US extended deterrence to Japan and South Korea in Chapters Six and Seven.

1.8 Conclusion

The chapter examines neoclassical realism and nuclear deterrence theory as a framework of analysis for this scholarship. Neoclassical realism employs international and domestic factors to explain a state's policy and its relation to international politics. Unfortunately, there is no fully-developed Chinese research paradigm or theoretical framework that could be used as a framework of analysis for this project. Neoclassical realism contends that states evaluate and adopt changes in their external milieu partly owing to their domestic patterns and political structures. Owing to the neoclassical realists' viewpoint, the structural or external factors alone are insufficient to make a case for reforms introduced by the Xi government since 2013, which has significantly increased China's share in the global distribution of power. A number of internal factors, identified by neoclassical realism and discussed in upcoming chapters, also play a vital role in the global rise of China. Related to neoclassical realism is the theory of nuclear deterrence discussed in detail in this chapter. Nuclear deterrence theory and its dynamics can help us examine and understand the rationale for China's nuclear force modernization and its implications for US nuclear deterrence and extended deterrence, and the regional deterrence equations involving states such as Japan, South Korea, India and Taiwan.

The following chapter examines the evolution and history of China's nuclear weapons program and the development of its strategic thinking. It is divided into two parts: Part I focuses on the evolution and development of nuclear weapons from 1949 to 1964; Part II examines the development of its nuclear weapons policy from 1964 until 2000. The chapter will prepare the ground for the subsequent two chapters, which focus on the structural and internal drivers of China's contemporary nuclear weapons force modernization.

Chapter Two

Evolution of the Chinese Nuclear Program
Part I: The Advent of Nuclear Weapons in China 1949-1964

2.1 Introduction

The US nuclear bombing of Hiroshima and Nagasaki in 1945 marked the advent of the nuclear age. Additionally, as World War II ended, it became apparent that the new international structure was a bipolar order. The US-led bloc included Western European countries (forged into the *North Atlantic Treaty Organization* (NATO) in April 1949) and Australia, Japan, New Zealand, and South Korea, all of which established their own alliance with the US. The geopolitical divide was reinforced in August 1949, when the Soviet Union tested its first atomic bomb. The test suggested that a balance of nuclear power was emerging. Later, in 1955, the Soviet Union established the Warsaw Pact, formally known as the *Treaty of Friendship, Cooperation, and Mutual Assistance*. It included Central and Eastern European Communist states.[259] Given the destructive nature of nuclear weapons, the superpowers went some way to avoid direct conflicts with one another throughout the Cold War. However, both powers remained involved in indirect conflicts, such as the Korean War (1950-1953), the Cross-Strait Crises of 1954-55 and 1958, the Cuban Missile Crisis (1962), and the Vietnam War (1964-1973). And as we will see – nuclear weapons played a role in each of these crises and influenced China's evolving views on the utility of nuclear weapons.

This chapter is divided into two parts (Part I and Part II) to examine the evolution of China's nuclear program and the development of its nuclear doctrine. Part I covers the developments in China's nuclear weapons program from 1949 to 1964, and is divided into five sections. Section one highlights how global nuclear politics unfolded after World War II between the US and Soviet superpowers, and how bipolar superpower rivalry influenced the views of the Chinese leadership towards nuclear weapons. Section two explores how China's nuclear threat perception formed and evolved, developing a rationale for the nuclear weapon program. The subsequent section examines China's

[259] The Warsaw Pact included the Soviet Union, Romania, Poland, Hungary, East Germany, Czechoslovakia, Bulgaria, and Albania. Albania withdrew in 1968 when it split with the USSR over differing interpretations of Marxism and disagreements over regional policies. https://jsis.washington.edu/wordpress/wp-content/uploads/2018/02/The-Warsaw-Pact-and-Eastern-Europe.pdf

quest to attain nuclear technology and weapons. Section four highlights a series of nuclear tests conducted by China, and section five examines the Sino-US rapprochement after China's nuclear weapons testing. It is noteworthy how China cooperated with both its Cold War rivals, the USSR and the US, to pursue its nuclear ambitions; pragmatism and need trumped ideological antagonisms.

Part II of the chapter covers developments from 1965 to 2000, and aims to identify and examine the reasons behind the evolution of China's nuclear weapons doctrine during this period. Part II is divided into four sections answering questions: a) What were the salient factors behind China's initial nuclear weapons policy? b) What were the causes of delay in formulating a comprehensive nuclear weapons doctrine in the initial years after the initial testing of nuclear weapons? c) How nuclear program transitioned from Maoist warfare strategies? and d), How did the program evolve later in the 1990s.

It is imperative to critically examine the evolution of China's nuclear weapons doctrine because doctrines are dynamic, and examination provides some insight into their potential future evolution and the rationale for such evolution. The chapter provides context and forms the base for an inquiry into the current status of China's nuclear weapons program in subsequent chapters.

2.2 China in the Post-war World: Between Paper and Real Tiger

Soon after World War II, there was a realization among the great powers that nuclear weapons were incredibly dangerous and destructive. Thus, each major power strived to acquire them. For Chairman Mao, nuclear weapons were the foremost political weapon, but initially, he had a different view. For example, in 1946, in a conversation with the American journalist Anna Louise Strong, he claimed,

> The atomic bomb is only a paper tiger which the United States reactionaries use to scare people. It looks scary, but in fact, it is not. Certainly, the atomic bomb is a weapon of mass slaughter, but the outcome of a war is decided by the people, not by one or two new types of weapons.[260]

However, only ten years later, in 1956, Mao's views had changed, as he said, "we also need the atom bomb. If our nation does not want to be intimidated, we have to have this

[260] Anna L. Strong, *Dawn comes up like Thunder out of China; An Intimate Account of the Liberated Areas in China*, (Bombay, People's Publishing House, 1948), 55 also see Mao Zedong, "A Conversation With American Journalist Anna Louise Strong," in *Selected Works of Mao Zedong, Vol. 4* (Beijing: People's Publishing House, 1991), 1194-95

thing."[261] Later in June 1958, Mao authorized the development of nuclear weapons, stating that making a bomb is possible in ten years.[262] Just before going nuclear, in early 1964, Mao stated that "our country may produce a small number of atomic bombs in the future, but we do not intend to use them."[263] Explaining Mao's thinking, Sun Xiangli writes that for Mao,

> [nuclear weapons] will become real tigers if a state does not have them – reflecting that the nuclear blackmail or intimidation can only be countered through the nuclear deterrence; and that the development of nuclear weapons 'is a destiny-determining matter'.[264]

Another Chinese scholar, Xu Weidi, attributed Mao's initial view that nuclear weapons were paper tigers to *dialectical materialism*.[265] For Weidi, two early generations of Chinese leaders had been deeply embedded in the Marxist theory of dialectical materialism, which suggests that the material basis of reality is continuously changing, involving contradictory processes between opposing sides. For them, nuclear weapons were both *paper tigers and real tigers* at the same time. For Xu Weidi, this contradictory view reflected a nuanced understanding of the role of nuclear weapons by Chinese leaders; nuclear weapons were paper tiger if you do not have them because it is people who determine the outcome of war, not weapons, but once states had them they become 'real' (useful to establish mutual deterrence).

In retrospect, China's early post-World War II disparagement of nuclear arsenals temporarily put to rest the fear among people in the Chinese government and the general public that China did not possess its own nuclear deterrent.[266] Later on, it evolved into doctrinal ambiguity, in the form of the No-First-Use (NFU) of nuclear weapons, to add value to deterrence as Chinese strategists believed nuclear weapons were only meant for

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[261] Major General Yang Huan, "China's Strategic Nuclear Weapons," *Federation of American Scientists*, accessed July 20, 2021, https://fas.org/nuke/guide/china/doctrine/huan.htm
[262] Ibid
[263] Zedong's conversation with foreign guests visiting China after attending the Tenth World Conference Against Atomic and Hydrogen Bombs held in Japan, in Selected Works of Mao Zedong on Diplomacy (Beijing: CCCPC Party Literature Publishing House and World Affairs Press, 1992) 540–41
[264] Sun Xiangli, "The Development of Nuclear Weapons in China" in "Li Bin and Tong Zhao, eds., *Understanding Chinese Nuclear Thinking* (Washington: Carnegie Endowment for International Peace, 2016), 82
[265] Xu Weidi, "China's Security Environment and the Role of Nuclear Weapons" in [265] Li Bin and Tong Zhao, eds., *Understanding Chinese Nuclear Thinking* (Washington: Carnegie Endowment for International Peace, 2016), 21
[266] John Baylis "Chinese Defense Policy", in John Baylis, ed., *Contemporary Strategy Volume II* (London: Holmes and Meier, 1987), 136. The Soviet Union adopted a similar rationale in the 1940s, see George Quester, "On the Identification of Real and Pretended Communist Military Doctrine," *Journal of Conflict Resolution,* Vol. 10, No. 2, (1966) 172–5

deterrence purposes (a detailed discussion on doctrinal ambiguity and NFU can be found in Chapter Five). The following section explores the reasons which motivated China to acquire its own nuclear weapons capability.

2.3 The Advent of Nuclear China: Historical Context

Just four days after the nuclear attack on Hiroshima, Chairman Mao, while addressing cadres in Yunnan Province, asked,

> Can atom bombs decide wars? No, they cannot… some of our comrades, too, believe that the atom bomb is all-powerful; that is a big mistake… what influence has made these comrades look upon the atom bomb as something miraculous? Bourgeois influence… these comrades often cling to the bourgeois world outlook and methodology.[267]

To emphasize his view that nuclear weapons were a paper tiger, Mao repeatedly communicated with the top tier of the Central Committee (CC) of the CCP and Chinese people directly. However, his communications remained a futile effort as 'those comrades,' and even Mao remained conscious and mindful of the outcomes of the US nuclear tests carried out at Bikini Atoll in mid-1946.[268] It was in reaction to these nuclear tests that Mao stated nuclear weapons were paper tigers and in the end, "revolutionary spirit would triumph over weapons."[269]

During the summer of 1949, Liu Shaoqi, a member of the CC of the CCP and head of the CCP delegation in Moscow, requested a visit to Soviet nuclear installations, which Stalin denied. However, the delegation was shown a film on the testing of Soviet nuclear weapons.[270] It is likely that Shaoqi himself wanted to witness Soviet nuclear development. The request which was denied was made a few days before the Soviet nuclear test. Later, while reacting to the Soviet Union's maiden testing of a nuclear device, on August 29, 1949, Communist China stated that,

> The Soviet Union has recently declared that she has had atomic weapons for some time already...this declaration is a heavy blow to the instigators

[267] Mao Tse-tung, Address of August 13, 1945, " The Situation and Our Policy After the Victory in the War of Resistance Against Japan," *Selected Works, IV* (Peking: Foreign Languages Press, 1961), 100 ; some excerpts available at https://www.marxists.org/reference/archive/mao/selected-works/volume-4/mswv4_01.htm

[268] William Harris, "Chinese Nuclear Doctrine: The Decade Prior to Weapons Development", 87-88

[269] Mark A. Ryan, *Chinese Attitudes Toward Nuclear Weapons: China and the United States During the Korean War* (London: Routledge, 1990) 17; Morton H. Halperin, *China and the Bomb* (New York: Praeger, 1967)

[270] Viktor M. Gobarev, "Soviet Policy Toward China: Developing Nuclear Weapons 1949–1969," *The Journal of Slavic Military Studies*, Vol. 12, No. 4, (1999), 3

> of atomic war. Thus it is clear that we [the Soviet Union and China] will certainly have sufficient strength to pulverize all the criminal plots of the warmongers.[271]

The test was followed by the PRC and USSR signing the *Sino-Soviet Treaty of Friendship, Alliance, and Mutual Assistance* on February 14, 1950, for 30 years. However, while the treaty initially did not mention nuclear weapons, China's then-Foreign Minister, Zhou Enlai, emphasized the inclusion of nuclear assurances, though vaguely, in the treaty that "the USSR shall render assistance…with all means at its disposal."[272] 'All means' implied the USSR would come to China's aid with nuclear weapons if necessary and it was likely to have been perceived as essential that this assurance was given for China to agree to forge an alliance with Moscow.

2.4 Early Development of China's Nuclear Threat Perception

Three events in the 1950s notably shaped China's nuclear threat perception, which led to the nuclearization of China. During these events, China experienced nuclear blackmail and intimidation from the US. The volatile strategic environment, shaped by the US nuclear bombing of Japan and the US nuclear threat, forced Mao and other Chinese leadership to pursue nuclear weapons programs actively. Hence, both structural or external factors (intimidation from external powers) and internal factors paved the way for China's overt nuclearization. These external and internal factors are two different levels of analysis identified by Neoclassical Realism and help deepen our understanding of key international relations issues, as discussed in Chapter One. The three notable events that influenced China's strategic thinking are the Korean War, and the first and second Cross-Strait Crises. These are discussed briefly below.

The Korean War (June 1950-July 1953), sanctioned by Soviet leader Joseph Stalin and supported by Mao, was initiated by North Korean premier Kim II Sung who was eager to launch an offensive against South Korea to unify the peninsula.[273] In August-September 1950, Beijing's military joined the war on the side of the North after assessing whether a possible nuclear strike from the US would occur should it invade to support North Korean forces against the South. According to some analysts, the Chinese force joined the theatre

[271] Radio Peking, International Service in English Morse to North America, October 4, 1949, quoted in William Harris, "Chinese Nuclear Doctrine: The Decade Prior to Weapons Development"
[272] Ibid
[273] "New Evidence on the Korean War" in *Cold War International History Bulletin*, Issues 6-7, "The Cold War in Asia," Winter 1995/1996, 30-125 available at https://www.wilsoncenter.org/publication/bulletin-no-67-winter-1995

for three main reasons; security considerations, China's domestic situation, and ideology.[274] From the security viewpoint, as the Korean War started, the Soviet Union became more cautious, refused to send its force to Korea, and provided only air support to the Chinese troops.[275] However, the Soviets agreed to provide the CCP with military equipment. Without the active Soviet support and reliance on the Sino-Soviet treaty against a possible US invasion, China joined the Korean War, which reflected China's fear and vulnerability to the US.[276] Mao was concerned that if US forces moved closer to the Chinese border, "all the North-eastern border defense forces will be absorbed," and guarding a one thousand kilometer border would not be possible.[277] Moreover, if the US forces remained stationed in the region, China and its plan to "regain" Taiwan would be under constant threat.[278]

On the domestic front, the communist leadership was fearful that the US presence in Korea would help the KMT forces in China and Taiwan against the CCP and Chinese forces, creating hurdles for the CCP to consolidate its power and regime, which had been established less than a year earlier. [279] The communist leadership was also fearful that the US presence on the border would divert their attention and give the reactionaries more space and time to plan and organize sabotage campaigns against the CCP. Apart from these factors, the CCP desperately needed new military equipment to upgrade its force against KMT forces.[280] Lastly, ideology also played an important role. Senior members of the CCP, particularly Mao, believed that they had to help "comrades" in North Korea fighting against invasion. In a telegram to Stalin, Mao wrote that assisting the Korean revolution would boost morale among revolutionary movements throughout East Asia.[281]

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[274] Allen S. Whiting, *China Crosses the Yalu: The Decision to Enter the Korean War* (Stanford,Cali.: Stanford University Press, 1960); Thomas J. Christensen, "Threats, Assurances, and the Last Chance for Peace: The Lessons of Mao's Korean War Telegrams," *International Security*, Vol. 17, No. 1(Winter 2000); Hao Yufan and Zhai Zhihai, "China's Decision to Enter the Korean War: History Revisited," *The China Quarterly*, No. 121(1990)

[275] Mark O'Neill, "Soviet Involvement in the Korean War: A New View from the Soviet-Era Archives," *OAH Magazine of History*, Vol. 14, No. 3,(2000), 20-24

[276] Whiting, *China Crosses the Yalu*, 151-163

[277] Thomas J. Christensen, "Threats, Assurances, and the Last Chance for Peace: The Lessons of Mao's Korean War Telegrams," *International Security*, Vol. 17, No. 1, (Winter 2000), 153

[278] Ibid

[279] Hao Yufan and Zhai Zhihai, "China's Decision to Enter the Korean War: History Revisited," *The China Quarterly*, No. 121, (1990) 104

[280] Bangning Zhou, *Explaining China's Intervention in the Korean War in 1950*, accessed December 10, 2021, http://www.inquiriesjournal.com/articles/1069/explaining-chinas-intervention-in-the-korean-war-in-1950

[281] Whiting, *China Crosses the Yalu*, 6-7; Christensen, "Threats, Assurances, and the Last Chance for Peace," 150-151; Michael H. Hunt, "Beijing and the Korean Crisis," June 1950-June 1951, *Political Science Quarterly*, Vol. 107, No. 3, (Autumn, 1992), 464-465

Two reasons convinced the Chinese leadership that the US would not attack China due to its involvement in the Korean War. Firstly, though Mao and the CCP leadership were skeptical of the alliance with the Soviet Union, they believed that the 1950 treaty with the Soviet Union would deter a nuclear attack on China. William Harris supports this notion, contending that the Sino-Soviet Treaty restrained the US from escalating the war from Korea into continental China.[282] Secondly, in the worst-case scenario, Beijing had estimated that, given the number of the US' nuclear weapons, even an all-out nuclear attack on Chinese soil would not be successful in obliterating China.[283] In September 1950, General Nieh Rong Zhen, deputy chief of staff of the PLA, told Indian then-ambassador, K. M. Panikkar, that "the Americans can bomb us, they can destroy our industries, but they cannot defeat us on land. We have calculated all that... They may even drop atom bombs on us. What then? After all, China lives on the farms."[284]

As the war progressed, in an internal directive, Truman declared he would "give active consideration" to the use of nuclear weapons and "the military commander in the field will have charge of the use of weapons."[285] This signaled America's readiness to use atomic weapons as, in April 1951, President Truman ordered the transfer of nine Mark-4 nuclear bombs from the US Atomic Energy Commission to the forward Strategic Air Command (SAC) bases in Guam and Okinawa.[286] However, a few years later, additional key details emerged. In early 1956, the US Secretary of State John Foster Dulles revealed how he conveyed "unmistakable warning" to China in May 1953 that the US would resort to using nuclear weapons if a negotiated end to the Korean War was not agreed upon. Dulles further added that there was "a pretty fair inference" that the nuclear threat had worked.[287] Prominent deterrence scholars, including Brodie, Alexander George, and

[282] William Harris, "Chinese Nuclear Doctrine: The Decade Prior to Weapons Development" 90
[283] K. M. Panikkar, *In Two Chinas* (London: Allen & Unwin, 1955), 107-108; also see Donald G. Brennan ed., *Arms Control, Disarmament and National Security* (New York: Braziler, 1961), 282-283
[284] William R. Harris, "Chinese Nuclear Doctrine: The Decade Prior to Weapons Development (1945-1955)," *The China Quarterly*, No. 21, (1968) 94
[285] Dennis Wainstock, *Truman, MacArthur, and the Korean War* (Westport: Greenwood Press, 1999), 102-103; also see University of Wisconsin Digital Collections, http://digicoll.library.wisc.edu/cgi-bin/FRUS/FRUS-idx?type=turn&id=FRUS.FRUS1950v07&entity=FRUS.FRUS1950v07.p1281&q1=atomic
[286] T.V. Paul, *The Tradition of Non-Use of Nuclear Weapons* (Stanford: Stanford University Press, 2009), 62-63
[287] Edward Friedman, Nuclear War and the End of the Korean War, 75; Roger Dingman, "Atomic Diplomacy during the Korean War," *International Security*, Vol. 13, No. 3 (Winter, 1988-1989), 50-91; Mark Kramer, "From The Russian Archives, Cold War International History Project," *Bulletin*, Issue 3, (Winter 1990/91) 15

Richard Smoke, also believed that the US nuclear threat worked and changed China's behavior during the conflict.[288]

Apart from the nuclear brinkmanship that took place during the Korean War, the war and the parallel developments in nuclear weapons technology, such as the development of Tactical Nuclear Weapons (TNWs) in the US in 1952 and its entrance into the stockpile in July 1953, dramatically impacted Beijing's approach towards nuclear weapons.[289] The fear of US TNWs loomed over Beijing during the Korean War because of the characteristics of the weapons, which made it more 'suitable' for employment (given the loss of life of the adversary would be less than a hydrogen bomb attack) in a limited conflict and thus potentially more politically palatable to use.[290] Due to the distinct advantages of TNWs, by the late 1950s, these weapons were deployed under US control in South Korea, Taiwan, Guam, and Hawaii.[291]

During the Korean War, the strategic nuclear superiority of the US over China and the Soviet Union, and Washington's open threats to China, intensified China's threat perception. Following the end of the Korean War, Beijing and Washington again locked horns during the Cross-Strait Crisis of 1945-55. The First Cross-Straits Crisis (September 1954 to May 1955) was mainly a conflict between the recently-established People's Republic of China (PRC) and the Republic of China (ROC) based in Taiwan. The US, a strategic ally of the ROC, came dangerously close to war with the PRC during this crisis. It started on September 3, 1954, when the PRC started artillery shelling of Quemoy Island held by the ROC. President Eisenhower, in his memoirs, writes that during the National Security Council meeting of September 12, 1954, "we were not talking now about a limited, brush-fire war. If we attack China, we're not going to impose limits on our

[288] Bernard Brodie, *War and Politics* (London: Macmillan, 1973), 105; Alexander L. George and Richard Smoke, *Deterrence in American Foreign Policy: Theory and Practice* (New York: Columbia University Press, 1974), 239; Rosemary J. Foot, "Nuclear Coercion and the Ending of the Korean Conflict," *International Security*, Vol. 13, No. 3, (Winter, 1988-1989), 102-103; Edward C. Keefer, "President Dwight D. Eisenhower and the End of the Korean War," *Diplomatic History*, Vol. 10, No. 3, (Summer 1986), 281-282

[289] Robert S. Norris, Thomas B. Cochran, and William M. Arkin, History of the Nuclear Stockpile, accessed July 21, 2021, https://fas.org/nuke/cochran/nuc_86010002a_56b.pdf

[290] Marc Trachtenberg, "A 'Wasting Asset': American Strategy and the Shifting Nuclear Balance, 1949–1954," *International Security*, Vol. 13, No. 3, (1988) 5–49; also see Rosemary Foot, "Nuclear Coercion and the Ending of the Korean Conflict," *International Security*, Vol. 13, No. 3, (Winter, 1988-1989) 92–112

[291] Robert S. Norris, William N. Arkin, and William Burr, "Where They Were," *The Bulletin of the Atomic Scientists*, Vol. 55, No. 6, (November 1999), 30

military actions, as in Korea."[292] However, on the recommendation of Dulles, Eisenhower rejected the use of nuclear weapons, realizing that "the course of action advocated by the Chiefs would bring America to the 'threshold' of an unlimited war with Communist China."[293] Responding to this, Dulles suggested that the matter be taken to the UNSC to gain allies' support to obtain a ceasefire.[294] He suggested that if the Soviet Union did not veto the resolution, the ceasefire would be called and would end the crisis, and if it did veto it, the US will have the support of its allies in the war.

Responding to the continuous PLA actions, the US assembled massive air and naval forces in the Cross-Straits and signed the *Mutual Defense Treaty* with the ROC on December 2, 1954. The US Congress approved the *Formosa Resolution* on January 29, 1955.[295] In January 1955, before the treaty entered into force, the PLA launched an airstrike on the Dachen Islands, which the ROC controlled. The ROC forces, with the assistance of the US Navy, repulsed the attack.[296] Later on April 23, 1955, during the first Asian-African Conference, the Chinese premier Zhou Enlai indicated a willingness to resolve the crisis through negotiation with the US.[297] During talks, the US side demanded that the PRC give up the option of the use of force to resolve the Taiwan issue. However, the PRC refused, as it viewed Taiwan as an internal matter.

The First Cross-Strait Crisis ended after three types of responses from the US side. The first was the *Treaty of Mutual Defense* between the Republic of China and the US, which committed the US to defend ROC and the Pescadores Islands. The US pledged to defend the ROC because the possible abandonment of the ROC to China would have significantly increased the latter's geostrategic outreach and position in Asia. Second, the *Formosa*

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[292] Dwight D. Eisenhower, *The White House Years: Mandate for Change, 1953-1956* (Garden City: Doubleday & Company, Inc., 1963), 464

[293] Bennett C. Rushkoff, "Eisenhower, Dulles and the Quemoy-Matsu Crisis, 1954-1955," *Political Science Quarterly*, Vol. 96, No. 3, (1981), 468

[294] Ibid

[295] House Joint Resolution 159 (84th Congress, 1st Session), January 29, 1995, *U.S. Department of State, American Foreign Policy, 1950-1955 Basic Documents, vol.1/2,* (Washington, DC: Government Printing Office, 1957), 2486-2487; also see Robert Accinelli "Eisenhower, Congress and the 1954-55 Offshore Island Crisis", *Presidential Studies Quarterly*, No.20, 329-344; Philip J. Briggs, "Congress and the Cold War: U.S.-China Policy, 1955," *China Quarterly*, No. 85, (March, 1981) 80-95; James M. Lindsay, *Congress and the Politics of U.S. Foreign Policy* (Baltimore: The Johns Hopkins University Press, 1994), 22-23

[296] Paul H.B. Godwin and Alice L. Miller, "China's Forbearance Has Limits: Chinese Threat and Retaliation Signaling and Its Implications for a Sino American Military Confrontation," *China Strategic Perspectives 6*, (Washington, D.C.: National Defense University Press, 2013)

[297] "Supplementary Speech of Premier Zhou Enlai at the Plenary Session of the Asian African Conference," April 19, 1955, Wilson Center Digital Archive, accessed December 11, 2021, https://digitalarchive.wilsoncenter.org/document/114673.pdf?v=ce9c0e9cb20be32dd81d71fd6cac75e9

Resolution permitted President Eisenhower to deploy US forces in case of an invasion of the ROC by China. Third, American officials, including President Eisenhower, signaled readiness to use nuclear weapons to end the crisis.[298] The First Cross-Strait Crisis multiplied pressure on Mao, and further intensified China's nuclear threat perception. In responding to these pressures, Mao in 1956 made the statement, "we also need the atom bomb. If our nation does not want to be intimidated, we have to have this thing."[299]

The Second Cross-Strait Crisis occurred in 1958 when China tried to break through the US-backed Taiwanese blockade to enhance trade and economic cooperation with Western European nations and Asian countries.[300] These plans were part of China's Great Leap Forward (1958 to 1961), a bold initiative to modernize China's economy. Ultimately, it failed because of impractical and ambitious policies.[301] However, the external aspect of the plan brought a significant realignment in China's foreign trade and relations.

The tensions between PRC and ROC peaked in August 1958, when Mao ordered the bombardment of the offshore islands.[302] However, before the crisis erupted, the Matador nuclear cruise missile was deployed in Taiwan.[303] Two years later, in January 1960, the US deployed the nuclear bombers in Taiwan, which "stayed for a decade and a half until July 1974."[304] However, in response to the PRC shelling, President Chiang Kai-shek of Taiwan requested US military support under the Mutual Defense Agreement. The US Navy provided full military support to Taiwanese forces. The US Seventh fleet escorted Taiwanese ships and supplied considerable military equipment, including ships, planes, and missiles.[305] While shelling from the PLA continued sporadically, no physical invasion materialized. On September 24, the US took over the responsibility of Taiwan's

[298] Michael Gordon Jackson, "Beyond Brinkmanship: Eisenhower, Nuclear War Fighting, and Korea, 1953-1968," *Presidential Studies Quarterly* 35, No. 1, (March, 2005), 52-75
[299] Zedong's conversation with foreign guests visiting China after attending the Tenth World Conference Against Atomic and Hydrogen Bombs held in Japan, in Selected Works of Mao Zedong on Diplomacy (Beijing: CCCPC Party Literature Publishing House and World Affairs Press, 1992) 540-41
[300] Bruce A. Elleman, *Taiwan Straits: Crisis in Asia and the Role of the U.S. Navy* (London: Rowman & Littlefield, 2014)
[301] Tom Orlik, "Lies, Damned Lies, and Chinese Statistics," *Foreign Policy*, March 20, 2013, accessed December 11, 2021, https://foreignpolicy.com/2013/03/20/lies-damned-lies-and-chinese-statistics/
[302] Melvin Gurtov, "The Taiwan Strait Crisis Revisited: Politics and Foreign Policy in Chinese Motives," *Modern China*, Vol. 2, No. 1, (1976), 50
[303] The deployment of six US nuclear-capable weapon systems was also underway in South Korea before the crisis erupted, which included "the Honest John surface-to-surface missile; the Matador cruise missile; the Atomic-Demolition Munition (ADM) nuclear landmine; the 280-mm gun; the 8-inch (203mm) howitzer; and nuclear bombs for fighter bombers." Hans M. Kristensen, "Nukes in the Taiwan Crisis," *Federation of American Scientists*, May 13, 2008, accessed, April 13, 2019, https://fas.org/blogs/security/2008/05/nukes-in-the-taiwan-crisis/
[304] Ibid
[305] Elleman, *Taiwan Straits: Crisis in Asia*, 59-74

air defense, and within two weeks, Communist China reduced its shelling. In June 1958, yielding to the external pressures and heightened threat posed by the US that was probably heightened further by the possibility the US might base nuclear weapons in Taiwan (which later occurred), Mao decided to develop nuclear weapons, stating that "to make atom bombs, hydrogen bombs, and intercontinental missiles, from my point of view, is perfectly possible in ten years."[306]

According to declassified US documents released in 2008, on the day after the PLA commenced shelling in August 1958, General Nathan Twining, the Chairman of the Joint Chiefs of Staff, while briefing President Eisenhower's cabinet about US Air Force plans, stated that "the US aircraft at the outset [or war] would drop 10-15 kilotons nuclear bombs on selected fields."[307] The US Pacific Air Command "drew up a contingency plan based on the assumption that the US would carry out the nuclear strikes against the Chinese forces."[308] In August 1958, five SAC-47 bombers deployed in Guam were put on alert to carry out nuclear strikes on the airbases inside China, if deemed necessary.[309] However, US Secretary of State, Dulles, during his conservations with Taiwanese leaders, did mention there were grave risks if they employed nuclear weapons. He was of the view that "the nuclear strikes would have inherent dangers and could also invite nuclear retaliation by the Communists."[310] Again, this illustrates that during the early Cold War, while the US had strategic nuclear superiority, it actively considered using nuclear weapons in crises with China and was not above blackmail; and China, mindful of this, came to the view that nuclear weapons were critical for its own security. Structural factor, an external threat posed to China, was the decisive factor in elevating China's threat perception and driving it to acquire nuclear arms.

These crises illustrated for China the limitations of relying only on conventional forces in a changing military world. It highlighted the salience that nuclear weapons had acquired both as instruments of political coercion and as a military deterrent. The Korean War, and Cross-Strait Crises, according to Jervis, influenced the future of China's power as it led to China's nuclearization. Consequently, it is not surprising that the Korean War

[306] Michael Pillsbury, ed. *Chinese Views on Future Warfare* (Washington, D.C.: National Defense University Press, 1997), 130
[307] Bernard C. Nalty, *The Air Force Role in Five Crises 1958-1965*, (USAF Historical Division Liaison Office; 1968) 17-26 accessed April 13, 2019, https://nsarchive2.gwu.edu//nukevault/ebb249/doc10.pdf
[308] Ibid
[309] Ibid
[310] Ibid., 25

played an important role in influencing Chinese foreign and defense policies. The political elite in Beijing realized that only nuclear weapons could equalize the threat and destruction of nuclear weapons. There was also the realization that these crises had not come to a decisive end – they could manifest again in the future, and China needed nuclear weapons capabilities for those eventualities. This appeared correct, as of November 2021, Taiwan has re-emerged as one of the key geopolitical issues between the US and China (a situation addressed in Chapter Eight). The Korean War helped China achieve direly needed strategic cooperation with the Soviet Union, primarily in nuclear weapons technology. Later, the strategic cooperation was extended to the full spectrum of defense, including missile technology assistance (addressed in the next section).

Beijing also had to cope with the provocative US nuclear strategy of massive retaliation, which was part of the *New-Look* policy of the Eisenhower administration announced in January 1954, as the strategic nuclear arms race between the superpowers was escalating.[311] The New-Look was premised on the idea that the US could not afford to expand its conventional forces to compete with the Soviets. Therefore, it decided to take a massive lead in the number of nuclear weapons, which the US SAC would deliver if needed, thus offsetting its conventional weaknesses.[312]

2.5 Sino-Soviet Strategic Cooperation

In 1954, after the Korean War, steps were taken to reorganize and revamp the People's Liberation Army (PLA). The Chinese Academy of Sciences (CAS) was made an independent organization, directly under the supervision of the State Council. In October 1954, Nikita Khrushchev assumed power in the Soviet Union and visited Beijing. Zhihua Shen and Yafeng Xia's recent account of Sino-Soviet nuclear cooperation suggests that Khrushchev was looking for external allies in the communist world to consolidate his power because of the domestic political crises he faced. Therefore, Khrushchev did offer some assistance to help China build a nuclear reactor for initial research and training purposes.[313] This, however, was not enough for Mao, who, by the mid-1950s, sought an

[311] Lawrence Freedman, *The Evolution of Nuclear Strategy*, 2nd edition (London: Macmillan, 1989), 76-90, 155-71; Matthew Jones, "Targeting China: U.S. Nuclear Planning and 'Massive Retaliation' in East Asia, 1953–1955," *Journal of Cold War Studies*, Vol. 10, No. 4, (2008) 37-65; Samuel F. Wells, Jr., "The Origins of Massive Retaliation," *Political Science Quarterly*, Vol. 96, No. 1, (Spring, 1981) 31-52
[312] Stephen E. Ambrose, *Eisenhower the President* (London: Simon and Schuster, 1984), 171
[313] Zhihua Shen and Yafeng Xia, *Between Aid and Restriction: Changing Soviet Policies toward China's Nuclear Weapons Program: 1954-1960, Nuclear Proliferation International History Project, Working Paper II* (Woodrow Wilson International Center for Scholars, Washington, 2012) 6

independent nuclear weapons program. Therefore, Mao kept pushing the Soviet leadership to transfer nuclear technology and lied to Moscow that this technological aid would only be used for civil purposes. As early as mid-January 1955, in a large meeting of the CCP senior leaders, Mao stated that,

> In the past years, we have been busy doing other things, and there was not enough time for us to pay attention to this matter [of nuclear weapons]. Sooner or later, we have to pay attention to it. We can achieve success provided we put it down as the order of the day. Now, [because] the Soviet Union is giving us assistance, we must achieve success! We can also achieve success even if we do it ourselves. As long as we have people and resources, we can create miracles![314]

At this meeting, the plan for the Chinese nuclear weapons program (code name 02) was approved.[315] However, the Soviet Union signed an agreement with China in April 1955 to assist in nuclear technology for peaceful purposes.[316] The agreement stipulated that the Soviets would provide the Chinese with the required scientific and technological reference materials, enough fuel and radioisotopes that would keep the Soviet-built nuclear reactor functioning, and train Beijing's nuclear physicists and engineers.[317]

Soon after embarking upon a nuclear weapons program in 1955, Chinese leaders began to consider the development of delivery systems. On March 14, 1956, the Aviation Industry Commission was established under the National Defense Ministry of China. Subsequently, in a May 1956 meeting of the Central Military Commission (CMC), Chinese Premier, Zhou Enlai, recommended that the "missile research should make a bit of a breakthrough…immediately amass forces, establish organizations and train talents."[318] Given the urgency, in July 1956, the Missile Management Bureau was launched. In less than a year, the organizational structure for missile development was put in place, which started working on the research and development of the missile program.[319]

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[314] Lewis and Xue, *China Builds the Bombs*, 38-39; Shen and Xia, *Between Aid and Restriction*, 10
[315] Ibid
[316] Viktor Gobarev, "Soviet Policy Toward China: Developing Nuclear Weapons 1949–1969," 21
[317] The agreement also stipulated that Moscow would help Peking in nuclear physics research and peaceful nuclear testing. It would also assist China in designing and building a roughly 6,500-10,000 KW heavy-water research reactor and a type of particle accelerator (12.5-25 MeV cyclotron). For more details see [Renmin ribao, 5 November 1956, 6; Li, Dangdai Zhongguo de hegongye, 20; Ge Nengquan, Qian Sanqiang nianpu [Chronology of Qian Sanqiang] (Jinan: Shandong Youyi Chubanshe, 2002), 119] quoted in Zhihua Shen and Yafeng Xia*, Between Aid and Restriction: Changing Soviet Policies toward China's Nuclear Weapons Program: 1954-1960*
[318] Shen and Xia, *Between Aid and Restriction*, 16
[319] Shen and Xia, *Between Aid and Restriction*, 16-17

Next, in August 1956, acceding to a Chinese request, the Soviets agreed to provide training pertinent to the development of missile technology. The Communist Party of the Soviet Union (CPSU) rendered the missile specialists and curriculum for missile technology to be taught in China.[320] Meanwhile, Chinese experts also sought an indigenous capability by training their own personnel while continuing to bargain a deal with the Soviets. After some delays, in March 1957, the Soviet Union agreed to sign an "Accord on Assisting the People's Republic of China on Special Technology."[321] The accord stipulated that Moscow would send as many as five experts to China to train Chinese experts in missile technology. The CCP ensured that the assistance received in this regard would be kept classified.

Despite an agreement, little substantive progress occurred until Khrushchev required Chinese support to push back growing domestic opposition to him in July 1957.[322] Given the narrow window of opportunity, Beijing once again requested assistance, and this time it was prompt. Moscow agreed to negotiate advance assistance in the establishment of the nuclear, missile, and aviation industries. After short negotiations, an agreement on "Developing New Weapons and Military Technology Equipment and Setting up a Comprehensive Atomic Energy Industry in China" (abbreviated as New Technology for National Defense Agreement) was signed between the two sides on October 15, 1957.[323]

Under the new agreement, the Soviet Union was obligated to support China in setting up a complete nuclear weapons industry, starting from initial research to nuclear weapons production, including sharing nuclear weapons blueprints.[324] Moreover, the Soviet Union would also transfer the equipment required for uranium enrichment and nuclear fuel for enrichment operations. The Soviet Union assisted China systematically in the research and production of missile technology, missile launcher designs and related areas. By the end of 1958, Moscow transferred four sets of surface-to-air missiles, with R2 missiles and

[320] Zhihua Shen and Yafeng Xia, *Between Aid and Restriction: Changing Soviet Policies toward China's Nuclear Weapons Program: 1954-1960*, 17
[321] Shen Zhihua and Yafeng Xia, "Hidden Currents during the Honeymoon: Mao Zedong, Khrushchev and the 1957 Moscow Conference," *Journal of Cold War Studies*, Vol. 11, No. 4, (Fall 2009) 74-117
[322] Ibid., 2
[323]Ibid., 21; Victor M. Gobarev, "Soviet Policy toward China: Developing Nuclear Weapons: 1949-1969," *The Journal of Slavic Military Studies*, Vol. 12, No. 4, (1999) 22, 30.
[324] Zhihua and Xia, "Hidden Currents during the Honeymoon," 21; Letter from Zhang Wentian to the Soviet Chargé Concerning the Development of the Atomic Energy Industry, August 12, 1957, History and Public Policy Program Digital Archive, PRC FMA 109-00792-02, 17. Translated by Neil Silver. Accessed March 23, 2020, https://digitalarchive.wilsoncenter.org/document/114341

related technologies, to Beijing.[325] The Soviets also helped the Chinese to locate and develop an appropriate site for missile testing.

The 1957 agreement proved to be a key turning point for China's nuclear aspirations, which now had mastery over sophisticated nuclear technology to produce nuclear weapons, and the missiles to deliver them. Later in August 1958, the CCP Central Committee approved a proposal to direct the atomic program towards military purposes.[326]

2.6 The Sino-Soviet Confrontation

Despite their nuclear cooperation, by the end of 1958, fissures in the relationship between Beijing and Moscow began to emerge. Disagreements over establishing a joint Sino-Soviet long-wave radio station, a joint submarine fleet, and China's shelling of Jinmen Island off Taiwan contributed to tensions in bilateral relations.[327] Despite this, the Soviet Union, due to China's ideological association with the Socialist bloc and a desire to honor the Sino-Soviet agreement that was forged with Moscow during the Cross-Strait Crises, made two public announcements vowing to extend a nuclear umbrella over China.[328] Khrushchev believed that being a strategic ally of Beijing meant the Soviet Union shared political responsibility for China's actions. In this view, Beijing should have consulted Moscow before launching a military offensive against the Jinmen Islands off Taiwan. On the other hand, Beijing was displeased with Moscow over the Soviet Union presenting a motion in January 1957 at the UN to ban nuclear testing and the Soviet Union's ongoing negotiations over the prevention of nuclear proliferation with the US and the British.[329]

Meanwhile, during the Second Cross-Strait Crisis of 1958, China got its hands on the US-made Sidewinder air-to-air missile after PLA forces shot down a Taiwanese Air Force jet. The Chinese were reluctant to grant the Soviets access to the missile, despite a request from Moscow. This infuriated Khrushchev so much that he withdrew his offer of sharing

[325] Ibid; Gobarev, "Soviet Policy toward China," 21-30
[326] Zhihua Shen and Yafeng Xia, *Between Aid and Restriction*, 23
[327] Shen Zhihua, "Khrushchev, Mao Zedong and the Unfulfilled Sino-Soviet Military Cooperation," *Social Sciences in China*, Vol. 24, No. 2 (Summer 2003), 118-126
[328] Zhihua Shen and Yafeng Xia, *Between Aid and Restriction: Changing Soviet Policies toward China's Nuclear Weapons Program: 1954-1960*, 30
[329] "Soviet Draft Resolution Introduced in the First Committee of the General Assembly: Cessation of Nuclear Weapons Tests, January 14, 1957, Department of State, Documents on Disarmament, 1945-1959 (Washington D.C.: Government Printing Office, 1960), Vol. 1, 736-737; also see Halperin, Sino-Soviet Nuclear Relations, 1957- 1960, 118

research material on the development of R-12 intermediate-range ballistic missiles. [330] After a few months, China delivered the improperly re-assembled missile to the Soviets. However, parts were missing. It is unclear whether the parts were deliberately removed or were not delivered because of negligence.[331]

These strategic and operational differences led Khrushchev to halt nuclear cooperation with China in 1959. Khrushchev then decided not to send a nuclear weapons teaching model to China, which had been packed and was awaiting orders to be delivered half a year earlier.[332] In a June 1959 letter to Beijing, Moscow took the position that since the negotiations on banning nuclear tests were ongoing between the Soviet Union, the US, and the UK, Moscow would temporarily halt the nuclear weapons teaching models delivery to Beijing.[333]

In doing so, Khrushchev effectively suspended the Sino-Soviet nuclear agreement. Khrushchev's decision enraged the Chinese leadership, leading China to direct more effort into developing its own independent indigenous capabilities as China was already hedging in this direction.[334] The sense of grievance and betrayal was so strong that China code-named the nuclear weapons project "596" as "a reminder date: June 1959" – when the Soviets reneged on the agreement.[335] In July 1959, Zhou Enlai proposed that China "act independently and with the initiative in our own hand."[336] Chinese leaders had to rely on nearly 38,000 Chinese scientists and academics who had received training in the Soviet Union.[337] The Soviets also started pulling their scientists and academics out of China and ceased to provide any research equipment. In June 1960, all Soviet experts working at China's Institute of Atomic Energy were ordered to return home and by August 23, 1960, all the Soviet experts, academics, and specialists assisting the Chinese in nuclear and other industries had to return to the Soviet Union.[338]

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[330] Shen and Xia, *Between Aid and Restriction*, 29
[331] Ibid
[332] Nikita Khrushchev, *Khrushchev Remembers: The Last Testament*, Strobe Talbott, trans. (Boston: Little, Brown and Company, 1974), 269
[333] Letter from the Communist Party of the Soviet Union Central Committee to the Chinese Communist Party Central Committee on the Temporary Halt in Nuclear Assistance, 20 June 1959, PRCFMA, No. 109-02563-01 [Document 10], pp. 1-3 quoted in Shen and Xia, Between Aid and Restriction
[334] Zhihua Shen and Yafeng Xia, *Between Aid and Restriction: The Soviet Union's Changing Policies on China's Nuclear Weapons Program*, 122
[335] Ibid
[336] Ibid
[337] Leo Yueh-yun Liu, *China as a Nuclear Power in World Politics* (London, Macmillan, 1972), 39-40
[338] Shen and Xia, *Between Aid and Restriction*, 120-127

The Sino-Soviet dispute reached a new height in August 1962, when the Soviets responded affirmatively to the US proposal for a *Non-Proliferation Treaty* (NPT). China accused the US of trying to curb its nuclear weapons development, Khrushchev of "nuclear adventurism," and then "capitulationism" during the Cuban Missile Crisis of October 1962.[339] The US was not oblivious to the Chinese nuclear weapons program. The Central Intelligence Agency (CIA) of the US was flying U2 spy planes from Taiwan to undertake espionage of China's developing program. In December 1961, a U2 spy plane took the first image of the supposed Chinese nuclear test site named Lop Nur.[340] According to newly declassified documents, the US proposed it and the Soviet Union take joint military action against the Chinese nuclear facilities. The Kennedy administration went to the extent of discussing a joint pre-emptive nuclear strike internally by flying strategic bombers over the Lop Nur site, however, the idea did not get to the planning level with the Soviets.[341] After Khrushchev rebuffed joint action, the Kennedy administration explored options for unilateral military action without the Soviets to prevent Beijing from realizing its goals.[342]

In July 1963, the US, the Soviet Union, and Britain reached an agreement on the draft of the *Partial Test Ban Treaty (PTBT)*. The CCP termed the agreement a fraud. The Soviets, while commenting on the CCP's statement, stated that the CCP wanted to "build communism on human corpses," fearing that Communist China wanted to acquire nuclear weapons to fight a nuclear war.[343] The tentative agreement was reached as China was preparing to test its first nuclear device. The next section explains how the series of Chinese nuclear tests unfolded after the first nuclear weapons test. Following that, the section investigates the initial response from the international community, primarily the US, which began to see China as a counterweight to the Soviet Union.

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[339] Walter C. Clemens, Jr., "The Nuclear Test Ban and Sino-Soviet Relations" in Morton H Halperin, ed., *Sino-Soviet Relations and Arms Control* (New Delhi: The English Book Store, 1968), 125

[340] William Burr, "The United States and the Chinese Nuclear Program, 1960-1964 Part II," *National Security Archive* Electronic Briefing Book No. 488 Posted - October 16, 2014, accessed Decembber 12, 2021, https://nsarchive2.gwu.edu/nukevault/ebb488/

[341] Gordon H. Chang, "JFK, China, and the Bomb", *The Journal of American History*, Vol. 74, No. 4, (March, 1988) 1393-4

[342] William Burr and Jeffrey T. Richelson, "Whether to 'Strangle the Baby in the Cradle': The United States and the Chinese Nuclear Program, 1960-64," *International Security*, Vol. 25, No. 3, (Winter 2000/01), 54-99

[343] Alice Langley Hsieh, "The Sino Soviet Dialogue: 1963" in Raymond L. Garthoff, ed., *Sino-Soviet Military Relations* (New York: Praeger, 1966), 150-70

2.7 China's Initial Nuclear Weapons Testing

China conducted its first nuclear test on October 16, 1964, two days after Khrushchev was ousted from power in Moscow. The nuclear device tested, weighing 1,550 kg, had a yield of 22 kilotons (kt).[344] Australia, India, Japan, Malaysia, ROC, New Zealand, the Philippines, South Korea, South Vietnam, Thailand, Uganda, the United States, and West Germany condemned the test.[345] However, China continued testing and carried out a second test on May 15, 1965, and a third on May 9, 1966. The fourth nuclear test was conducted on October 27, 1966.[346] The latter was a unique test because the warhead was mated with a DF-2 missile. There was a significant risk involved in testing a nuclear warhead in this manner for several reasons, as the missile might not reach, or may deviate, from its designated destination, or may explode during the boost phase (initial launch) or re-entry (returning to earth) phase. Chances of radioactive contamination also increase as the wind may sweep up the cloud which forms after a nuclear explosion. However, the test was successful. Mao stated after the test, "Who holds that we Chinese cannot make a missile-carried nuclear weapon? Now we have succeeded."[347] The fifth test, which contained thermonuclear material, confirmed the design of a two-stage device and was carried out on December 28, 1966. The sixth test of June 17, 1967, certified China as a thermonuclear power.[348]

In 1963 China created an eight-year plan for four different types of missile development. These were linked to four hypothetical targets identified by Beijing in 1964: Japan (DF-2), the Philippines (DF-3), Guam (DF-4), and the continental US (DF-5).[349] Targets in the Soviet Union were added to the Chinese target list after a military confrontation with the Soviet Union over the Ussuri River in September 1969.[350]

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[344] John Wilson Lewis and Hua Di, "China's Ballistic Missiles: Technologies, Strategies, Goals", *International Security*, Vol. 17, No. 2, (Fall, 1992) 15; according to Arms Control Association the yield of the first nuclear weapon test was 20kt https://www.armscontrol.org/print/7196

[345] Walter C. Clemens, Jr., "Chinese Nuclear Tests: Trends and Portents," *The China Quarterly*, No. 32, (1967) 117

[346] Ibid; Robert S. Norris, "French and Chinese Nuclear Weapon Testing," *Security Dialogue*, Vol. 27, No. 1, (March, 1996) 39-54

[347] Lewis and Xue, *China Builds the Bomb*, 202-03, 209

[348] Ibid.; Clemens, Jr., "Chinese Nuclear Tests"; Norris, "French and Chinese Nuclear Weapon Testing," 39-54

[349] Lewis and Xue, *China Builds the Bomb*, 202-209

[350] Ibid., 211-213

2.8 The Sino-US Rapprochement

The Sino-Soviet split paved the way for the US to reach out to China. Pakistan initially played a bridging role between China and the US as it enjoyed cordial relations with both. In July 1971, US National Security Advisor (NSA) Henry Kissinger made a secret visit to Beijing from Pakistan.[351] His visit laid the groundwork for US President Richard Nixon's historic trip in 1972. At the height of the Cold War, it was a dramatic U-turn by the Nixon administration from active confrontation with China to the Sino-US rapprochement, whereby the Nixon administration embraced the One-China-Policy.[352] Central to this was the US government, in 1979, stating that "the government of the People's Republic of China was 'the sole legal Government of China'. Sole, meaning the PRC was and is the only China, with no consideration of the [Republic of China] ROC as a separate sovereign entity."[353] From 1972 onwards, the building blocks of US-China relations emerged. These included three U.S.-China joint communiqués, the Taiwan Relations Act (TRA), and a series of policy statements made over the years, also known as the 'six assurances' (outlined in the footnote below).[354]

From the early 1970s, successive US administrations viewed a militarily strong China to be a key counterbalance to the Soviet Union. Even without Beijing's request, Nixon administration officials began to share intelligence reports on Soviet military capabilities and installations.[355] Through Kissinger's facilitation, two large supercomputers were sold to China in 1976.[356] Relations were further deepened during President Jimmy Carter's administration, and Beijing was allowed to access some US technologies related to

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[351] "Getting To Beijing: Henry Kissinger's Secret 1971 Trip," *US-China Institute*, University of Southern California, July 21, 2011, accessed December 12, 2021, https://china.usc.edu/getting-beijing-henry-kissingers-secret-1971-trip

[352] Patrick Tyler, "The (Ab)normalization of U.S.-Chinese Relations," *Foreign Affairs*, Vol. 78, No. 5, (1999), 93-122

[353] Michael J. Green, "What Is the U.S. "One China" Policy, and Why Does it Matter?" *CSIS*, January 13, 2017, accessed December 12, 2021, https://www.csis.org/analysis/what-us-one-china-policy-and-why-does-it-matter

[354] 1. Had not agreed to set a date for ending arms sales to the Republic of China. 2. Had not agreed to hold prior consultations with the PRC regarding arms sales to the Republic of China. 3. Would not play a mediation role between the PRC and the Republic of China. 4. Would not revise the Taiwan Relations Act. 5. Had not altered its position regarding sovereignty over Taiwan. 6. Would not exert pressure on the Republic of China to enter into negotiations with the PRC. Green, What Is the U.S. "One China" Policy, and Why Does it Matter?; Richard C. Bush, "A One-China Policy Primer, Center for East Asia Policy Studies," *East Asia Policy Paper*, March 2017 accessed 14 April, 2019 available at https://www.brookings.edu/wp-content/uploads/2017/03/one-china-policy-primer.pdf

[355] Matin Zuberi, "Soviet and American technological assistance and the pace of Chinese nuclear tests," *Strategic Analysis*, Vol. 24, No. 7, (2000), 1247-1266

[356] Ibid

economic development and defense.[357] Moreover, the Carter administration did not oppose the sale of a nuclear reactor to China by France in 1978.[358]

During President Ronald Reagan's administration, China secured access to the currently modern technology, advanced computers, anti-submarine torpedoes, antitank missiles, and other sophisticated technologies.[359] The Tiananmen Square massacre of 1989 led to a ban on exporting military equipment to China. However, the sale of dual-use technology continued. [360]

In the nuclear domain, the Reagan administration signed an agreement with the PRC for peaceful nuclear cooperation in July 1985. Congress took 13 years to ratify it, which occurred in March 1998 under the Clinton administration.[361] The Clinton administration's high-level engagement with China was the core element because the administration sought to promote "China's emergence as a stable, non-aggressive state that plays a constructive role in the world community and participates in addressing a broad range of foreign policy issues, including arms control."[362] Despite hesitancy, between 1995 to September 1999, Washington allowed China to purchase 100 supercomputers from the US.[363] These were crucial for conducting simulated nuclear tests for more miniaturized and efficient nuclear weapons.[364] The supercomputers were purchased under Clinton's 'de-regulate technology export' policy.[365] In short, the souring of Sino-Soviet relations was seen as a strategic opportunity by successive US administrations. The aim was to build up Chinese capabilities against the Soviet Union. For China, it was a win-win situation.

[357] Jean A. Garrison, "Explaining Change in the Carter Administration's China Policy: Foreign Policy Adviser Manipulation of the Policy Agenda," *Asian Affairs: An American Review*, Vol. 29, No. 2, (2002), 83-98
[358] Jean A. Garrison, "Explaining Change in the Carter Administration," 85
[359] Aaron L. Friedberg, "Arming China Against Ourselves," *Commentary*, July-August 1999, 28-9
[360] Ibid
[361] Jennifer Weeks, "Sino-U.S. Nuclear Cooperation at a Crossroads," *Arms Control Association*, accessed December 12, 2021, https://www.armscontrol.org/act/1997-06/features/sino-us-nuclear-cooperation-crossroads
[362] Ibid
[363] Zuberi, "Soviet and American technological assistance and the pace"; Friedberg, "Arming China Against Ourselves," 29-30
[364] Ming Zhang, "What threat?" *Bulletin of the Atomic Scientists*, September/ October 1999, 53; Aaron L. Friedberg, "Arming China," 29-30
[365] Ibid

2.9 Part II: Advent of China's Nuclear Weapons Doctrine, 1965-2000

On October 16, 1964, China carried out its first nuclear weapons test.[366] On the same day, China outlined the broad contours of its nuclear weapons-use policy and doctrine, which stipulated that "China has conducted the nuclear test only for the purpose of defense and it would not be the first to use (No-First-Use) nuclear weapons at any time or under any circumstances."[367]

2.10 China's Initial Nuclear Weapons Doctrine

Although China had developed a nascent nuclear deterrent capability by the mid-1960s, how China intended to use such remained widely unknown to many scholars for almost three decades after its first nuclear tests.[368] Several reasons are associated with the delay in identifying and comprehending China's nuclear weapons use doctrine. For a start, by the mid-1960s, China had a small, vulnerable nuclear inventory based on five warheads compared to the US (31,139) and the USSR (6,144).[369] In 1970 China had 75 warheads, whereas the USSR had 11,736 and the US had 26,008 warheads.[370] In 1975, when the Vietnam war ended, China had 180 warheads, whereas the USSR had 19,235, and the US had 27,519.[371]

Table 2. Great power nuclear weapons stockpiles, 1964–1986

Year	US	USSR	UK	France	China
1964	29,463	5,424	271	4	1
1970	26,008	11,736	375	36	75
1975	27,519	19,235	500	188	180
1986	23,317	40,159	350	355	224

Though the US began to reduce the number of nuclear weapons from 1967 and the USSR from 1986 onwards, the number of China's nuclear weapons remained very low.[372] China

[366] William Burr, *The United States and the Chinese Nuclear Program, 1960-1964 Part II, Briefing Book # 488*, Published: October 16, 2014, accessed December 12, 2021, https://nsarchive.gwu.edu/briefing-book/nuclear-vault/2014-10-16/chinas-first-nuclear-test-1964-50th-anniversary
[367] Xia Liping, "On China's Nuclear Doctrine," *Journal of China and International Relations*, Vol. 3, No. 1, (2015) 167
[368] M. Taylor Fravel and Evan S. Medeiros, "China's Search for Assured Retaliation: The Evolution of Chinese Nuclear Strategy and Force Structure," *International Security*, Vol. 35, No. 2, (2010), 48-87
[369] Hans M. Kristensen and Robert S. Norris, "Global nuclear weapons inventories, 1945–2013," *Bulletin of the Atomic Scientists*, Vol. 69, No. 5, (2013), 78
[370] Ibid
[371] Ibid
[372] Kristensen and Norris, "Global nuclear weapons inventories," 78

did not seek to develop more nuclear weapons or a nuclear weapons doctrine to overcome its relative inferiority against the US or the Soviet Union – indeed, one might expect China to have adopted a 'hair-trigger' doctrine (to fire at the first sign of a severe threat) in order to use its nuclear force before it lost it, and in the process strengthen its deterrent.[373] Or perhaps it thought an assertive policy could invite a first strike. In any event, it opted for a restrained and arguably underdeveloped doctrine, possibly suggesting that its threat perception had declined after it carried out its initial nuclear tests; it had sufficiently equalized the nuclear threat posed by the US and USSR. To deepen our understanding here, this research now considers the internal factors as identified by neoclassical realism but that are often overlooked in the case of China, such as internal political constraints, organizational incapacity, and limited strategic thinking that played a secondary role in delaying (or at least restrained) China's nuclear doctrinal development.

2.10.1 **Internal Political Constraints**

Since 1949, China's political system has remained centralized, where authority is vested in a few individuals or groups, and the CCP dominates the decision-making process.[374] The nature and level of centralized political authority were so durable that it generated a greater level of political, institutional, and strategic restraint throughout the establishment and evolution of China's nuclear weapons doctrine.[375]

Since external security considerations and experience with real-world nuclear crises were the main drivers of China's nuclear weapons program, as discussed in detail in Part I, Chinese policymakers were very vigilant about the potential security threat to their nuclear weapons program from outside sabotage and subversion. This motivated them to keep their nuclear weapons program veiled from the international limelight and discouraged extensive deliberations on China's nuclear doctrine and program development trajectory that could come out into the open. Within the PLA, the Second

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[373] "What is Hair-Trigger Alert?" *Union of Concerned Scientists*, October 3, 2014, accessed December 12, 2021, https://www.ucsusa.org/resources/what-hair-trigger-alert; Leanna Garfield, "The US still keeps hundreds of nuclear weapons on hair-trigger alert: Here's what it means and why it's a huge risk," *Business Insider*, June 14, 2018, accessed December 12, 2021, https://www.businessinsider.com.au/trump-kim-nuclear-summit-hair-trigger-alert-2018-6

[374] Eleanor Albert, Lindsay Maizland, and Beina Xu, "The Chinese Communist Party," Last updated June 23, 2021, *Council for Foreign Relations (CFR)*, accessed December 12, 2021, https://www.cfr.org/backgrounder/chinese-communist-party; A. Doak Barnett, "Political Power in Communist China," *Journal of International Affairs*, Vol. 11, No. 2, (1957) 102-110;

[375] Eric Heginbotham, Jacob L. Heim and Christopher P. Twomey, "Of Bombs and Bureaucrats: Internal Drivers of Nuclear Force Building in China and the United States," *Journal of Contemporary China*, Vol. 28, No. 118, (2019), 538-557

Artillery Corps (SAC) security requirements were extraordinary.[376] Moreover, the PLA was guided by the CCP, so it had a strong allegiance to Mao's strategic thought, which continued until the 1990s.

Meanwhile, there was a lack of coordination across the nuclear bureaucracy, between scientists, military officials, diplomats, and civilian experts.[377] This disconnect continued during the early years of the reforms of the 1980s, which kept a unified institutional approach from developing.[378] Later on, with China's greater participation in international forums, it acceded to the treaty on the Prohibition of the Emplacement of Nuclear Weapons and Other Weapons of Mass Destruction on the Sea-Bed and the Ocean Floor and in the Subsoil Thereof in 1991, ratified the NPT in 1992, supported the indefinite extension of NPT in 1995 and, helped to negotiate and signed Comprehensive Test Ban Treaty (CTBT), and joined Zangger Committee also known as nuclear exporters committee and the role in the Conference on Disarmament (CoD) and the United Nations (UN) pushed China to develop better expertise. For instance, China initially rejected *the Outerspace Treaty* and *the Biological Weapons Convention*, but after greater participation and developing domestic expertise, China ratified the treaty in 1970. Similarly, China committed in 1986 to not conduct atmospheric nuclear tests. It went on to sign the *Non-proliferation Treaty* in 1992 after decades of official disapproval in which it called the NPT a discriminatory treaty aimed at institutionalizing US-Soviet nuclear hegemony. China had come to view being part of the official non-proliferation regime as being in its interests. Apart from the change in the views of China on nuclear non-proliferation and regimes, the participation in the international multilateral forums helped China broaden its understanding of the nuclear policies of the US and the Soviet Union and of their interests. China, out of fear over the growing emerging global nuclear order, also wanted to control and manage these regimes. Hence, after Deng's reforms, China began to develop a capacity in the 1990s to overcome its existing hurdles and political constraints. This greater participation also enabled China to develop a nuanced understanding of its own nuclear weapons policy.

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[376] John Lewis and Xue Litai, *Imagined Enemies: China Prepares for Uncertain War* (Stanford, Calif.: Stanford University Press, 2006), 173-213

[377] Alastair Iain Johnston, "Learning versus Adaptation: Explaining Change in Chinese Arms Control Policy in the 1980s and 1990s," *China Journal*, No. 35, (January, 1996) 27–61; also see Evan S. Medeiros, *Reluctant Restraint: The Evolution of China's Nonproliferation Policies and Practices, 1980–2004* (Stanford, Calif.: Stanford University Press, 2007), 210-239

[378] Ibid

2.10.2 **Organizational Incapacity**

The second important factor which hindered the development of China's nuclear weapons doctrine was the organizational incapacity of the PLA, partially stemming from political constraints. After China conducted its first nuclear tests, it entered into the era of the Cultural Revolution from 1966 to 1976, a decade of violent revolution (and elite conflict) that led to massive loss of life, as somewhere between 500,000 and two million perished.[379] During that period, the PLA's institutions, such as the Academy of Military Sciences (AMS) and the Military Affairs Academy (now National Defence University), were ineffective and military research was in a state of paralysis.[380] By contrast, China's nuclear scientific community dominated nuclear weapons doctrine making as Fravel and Evan write,

> China's leading weapons scientists exercised such influence over nuclear strategy by directly interpreting the requirements suggested by Mao's and Deng's ideas and expressing them in China's nuclear and missile procurement plans. The operational arms of the PLA under the General Staff Department had little role in these processes.[381]

During this time, China lacked the organizational structure required to make a clear nuclear weapons policy. The PLA was also lagging in military academic research until 1978 when the first academic studies research office was established.[382]

2.10.3 **Limited Strategic Thinking**

Lastly, the strategic orientation of leaders such as Mao Zedong and Deng Xiaoping towards nuclear weapons kept China focused on the minimal needs for nuclear deterrence.[383] In essence, they believed that the threat of nuclear retaliation, even with a small nuclear force, would preserve deterrence.[384] The literature from western and

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[379] People died from murder, suicide, hunger, illness. Anne F. Thurston, *Enemies of the People* (New York: Alfred A Knopf, 1987), 133-138; Hong Yung Lee, *The Politics of the Chinese Cultural Revolution: A Case Study* (Berkeley: University of California Press, 1978), 1-3, 9-25; Tom Phillips, "The Cultural Revolution: All You Need to know about China's Political Convulsion," *The Guardian*, May 11, 2016, accessed December 13, 20021, https://www.theguardian.com/world/2016/may/11/the-cultural-revolution-50-years-on-all-you-need-to-know-about-chinas-political-convulsion

[380] Fravel and Evan, China's Search for Assured Retaliation, 67

[381] Ibid

[382] Ibid

[383] Ibid., 71; Alastair Iain Johnston, "Learning versus Adaptation: Explaining Change in Chinese Arms Control Policy in the 1980s and 1990s," *China Journal*, No. 35, (1996), 27-61; Evan S. Medeiros, *Reluctant Restraint: The Evolution of China's Nonproliferation Policies and Practices, 1980–2004* (Stanford, Calif.: Stanford University Press, 2007), 210-239; Fred Kaplan, *The Wizards of Armageddon* (Stanford, Calif.: Stanford University Press, 1991)

[384] Alastair Iain Johnston, "China's New "Old Thinking": The Concept of Limited Deterrence," *International Security*, Vol. 20, No. 3, (1995/1996), 17-19

Chinese sources on the history of China's nuclear program suggests that Mao never held substantive views on the operational requirements for a credible retaliatory strike capability and thought even the threat of a "few" was enough to generate the necessary deterrent effect, even if the threat lacked much credibility.[385] For instance, Mao in 1960 stated that "our country in the future may produce a few atomic bombs, but we by no means intend to use them…"[386] In an interview with Edgar Snow in 1965, Mao maintained, "we do not wish to have too many atomic bombs ourselves. What would we do with so many? To have a few is just fine."[387] Additionally, Mao, in 1967, reportedly told Andrew Malreaux "when I have six atomic bombs, no one can bomb my cities…the Americans will never use an atom bomb against me."[388] It was only after the death of Mao in September 1976 that China's strategic orientation began to change. The new Chinese leadership viewed nuclear weapons' utility as lying in three key functions: deterring, resisting nuclear threat or coercion, and avoiding nuclear war, as discussed in the next section.

2.10.3.1 Deterring Adversaries

Before acquiring nuclear weapons, Mao and the CCP were well aware of the importance of deterrence and that nuclear weapons posed a threat to China so long as they did not possess their own. Mao gradually embraced the notion of mutual deterrence in response to crises with the US and the Soviet Union (discussed above). Reflecting on nuclear deterrence and mutual destruction, Mao in 1970 stated that "although the possibility of the major powers fighting a world war remains, everyone does not dare to start such a war only because they have nuclear weapons."[389]

Similarly, second-generation leaders such as Deng also viewed nuclear weapons as a weapon to deter. Deng in 1975 stated that "France has also built some [nuclear weapons]. We understand [why] France has built them. Britain has also made some, but not many. Our reason for building a few is that we will have them if they have them. Nuclear

[385] Jeffrey Lewis, *Paper Tigers: China's Nuclear Posture, Adelphi Papers* (London: Routledge, 2014) 28; Yao Yunzhu, "Chinese Nuclear Policy and the Future of Minimum Deterrence," in Christopher P. Twomey, ed., *Perspectives on Sino-American Strategic Nuclear Issues* (New York: Palgrave Macmillan, 2008), 111-124

[386] Fravel and Medeiros, "China's Search for Assured Retaliation," 63

[387] Ibid; M. Taylor Fravel, *Active Defence: China's Military Strategy Since 1949*, (Princeton, NJ.: Princeton University Press, 2019), 239

[388] Richard M. Nixon, *RN : The Memoirs of Richard Nixon* (New York: Grosset and Dunlap, 1978), 557

[389] Mao Zedong and China's nuclear energy industry (Beijing: Yuanzineng chubanshe, 1993), 13, quoted in Fravel and Medeiros, *China's Search for Assured Retaliation*, 59

weapons have only this [deterrence] function."[390] By 'they,' Deng meant the US and the Soviet Union.

2.10.3.2 Resisting Nuclear Blackmail

Apart from the deterrent (defensive) role, the Chinese leadership viewed nuclear weapons as a (balancing) tool to *resist nuclear intimidation and blackmail*.[391] After the end of the Korean War, Mao in 1954 opined that "Imperialists [the US] assess that we only have a few things and then they come to bully us. They say, 'How many atomic bombs do you have?'"[392] Similarly, Marshal Nie also viewed the utility of nuclear weapons as useful to prevent nuclear blackmail.[393] Commenting on China's future possession of nuclear weapons, Nie said that "when the Chinese people have this weapon, [the US] nuclear blackmail toward the people of the world will be completely destroyed."[394]

2.10.3.3 Avoiding Nuclear War

Lastly, the Chinese political leadership viewed that the utility of nuclear weapons lies primarily in avoiding nuclear war. Mao's concept of *people's war* emphasized that 'the people' are the decisive element of war. Mao, quite a few times, stressed that only people, not weapons, win wars and that the people are superior to nuclear weapons in war.[395] It appears that by the mid-1970s, a shift in strategic thought was emerging in China when Deng stated that despite their more-developed nuclear doctrines, the US and the Soviet Union were not likely to wage a nuclear war because it is a challenging and complicated

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[390] Selection of Deng Xiaoping's expositions on army building in the new period] (Beijing-Bayi chubanshe, 1993), 44-45 in Fravel and Medeiros, *China's Search for Assured Retaliation*, 63

[391] Liping Xia, "China's Nuclear Doctrine: Debates and Evolution," *Carnegie Endowment for International Peace*, June 30, 2016, accessed July 22, 2021, https://carnegieendowment.org/2016/06/30/china-s-nuclear-doctrine-debates-and-evolution-pub-63967; Fravel and Medeiros, *China's Search for Assured Retaliation*, 60

[392] Mao Zedong, *Mao Zedong junshi wenji* [Mao Zedong's selected works on military affairs], Vol. 6 (Beijing: Junshi kexue chubanshe, 1993), 359

[393] When China came into being on October 1, 1949, Mr. Nie served as Mayor of Beijing and the acting chief of the army's General Staff. Nie was a veteran of the Chinese civil war, a deputy prime minister in 1956-1974, beginning in 1957 he also served as a head of the science and technology commissions that developed China's atomic bomb, and later became one of the tenth PLA Marshals and chairman of state.

[394] *Nie Rongzhen junshi wenxuan* [Nie Rongzhen's selected works on military affairs] (Beijing: Jiefangjun chubanshe, 1992), 498

[395] Fravel and Medeiros, *China's Search for Assured Retaliation*, 61; Mao Zedong, *Mao Zedong's selected works*, 2nd ed., Vol. 4, (1991), 1133-1134; Xu Weidi, "China's Security Environment and the Role of Nuclear Weapons" in Li Bin and Tong Zhao, *Understanding Chinese Nuclear Thinking* (Washington, DC.: Carnegie Endowment for International Peace, 2016), 19-50; Ministry of Foreign Affairs of the People's Republic of China and CCCPC Party Literature Research Office, eds., *Selected Works of Mao Zedong on Diplomacy* (Beijing: CCCPC Party Literature Publishing House and World Affairs Press, 1994), 60-61; Zhenqiang Pan, "A Study of China's No-First-Use Policy on Nuclear Weapons," *Journal for Peace and Nuclear Disarmament*, Vol. 1, No. 1, (2018), 115-136

decision to make, owing to the devastating nuclear inventory each side possessed. He also asserted that future wars were more likely to be fought conventionally. For Deng, waging a nuclear war was not a war-winning approach. With Deng in power, Mao's established warfare strategies began to change, though they retained some characteristics emphasized by Mao. The next section highlights the transition, which appeared after the death of Chairman Mao.

2.11 The Transition from Maoist Warfare Strategies

China's conventional-first military approach to its security was never divorced from its national defense strategy. The people's war was a strategy to fight a superior enemy by replacing space with time, luring the adversary deep inside Chinese territory, forcing it to overstretch its means of communication, and then counter-attack it.[396] China's massive population and large territory made it possible for China to successfully implement the people's war strategy to survive the Japanese invasion of China in the 1930s.[397] One of the main features of strategic thinking behind the people's war is to convert an adversary's strength into a weakness. Mao's strategy posited that as "the enemy advances, we retreat. The enemy halts, we harass. The enemy tires, we attack. The enemy retreats, we pursue."[398] The strategy emphasizes deception, ruses, and ambushes.

The people's war was considered applicable even after China became a nuclear power. However, during the Korean War, neither an all-out nuclear attack nor a large-scale ground invasion took place that required the strategy to be enacted.[399] As such, the utility of the people's war strategy was questioned since it seemed it was unlikely to be needed, and thus a more proactive strategy could replace it given China's rising power/changing national interests.[400] China's understanding of its strategic requirements was evolving as a PLA officer, General Su Yu, in 1978 proposed the idea of "*People's War under Modern Conditions*," emphasizing the need for new strategies based on new technologies such as sophisticated electronic reconnaissance and communications systems, computers and

[396] Mira Beth Lansky, "'People's War' and the Soviet Threat: The Rise and Fall of a Military Doctrine, "*Journal of Contemporary History*, Vol. 18, No. 4, (1983) 619-649
[397] Owen and Eleanor Lattimore, *Our Chinese Ally* (Washington: American Historical Association. Historical Service Board, 1944) 33-43
[398] Ralph L. Powell, "Maoist Military Doctrines," *Asian Survey*, Vol. 8, No. 4, (April 1968) 251
[399] Ellis Joffe, *The Chinese Army after Mao*, (Weidenfeld and Nicolson, London, 1987), 74
[400] Ibid., 70-74

automatic control systems.[401] However, it was only in the post-Mao years that China's leadership began to depart from Mao's doctrine of people's war, although they sought to keep Mao's people's war philosophy intact to ensure political legitimacy at home.[402]

2.11.1 **Revisiting People's War**

Significant revisions in conventional warfare strategies were made in the late 1980s and 1990s. The doctrine of people's war was complemented with *modern conditions* towards the end of 1987.[403] The focus was on ideas presented by General Su Yu.[404] He emphasized the significance of "mobile warfare, offensive campaign, quick and decisive battles, and positional warfare."[405] Some scholars have argued that this new doctrine of people's war under modern conditions was based upon the assumptions that future military conflicts would involve large-scale modern weapons,[406] and China would be the battleground of great powers, what Mao called a "vast zone".[407]

2.11.2 **Active Defense Strategy**

After the death of Mao in 1976, Deng and other senior PLA officials proposed the Active Defense strategy in 1980.[408] The Active Defense strategy was aimed at conducting limited wars of high intensity against potential adversaries.[409] The objective was to formulate the doctrine and gather the required military wherewithal for active defense beyond nearby territorial seas. In some respects, this was the beginning of China pushing its interests and military capabilities outwards into the Pacific. In the 1990s, three new interconnected assumptions were introduced, which in essence were opposite to Mao's strategies.[410] First, no protracted long-term war was expected to take place against China in the coming decades; however, the chances of a limited war could not be ruled out.[411]

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[401] Lansky, "'People's War' and the Soviet Threat," 633; Xinhua, 5 August 1977; in Foreign Broadcast Information Service, Daily Report: People's Republic of China (hereafter FBIS-CHI), 8 August 1977, E/21 in Ellis Joffe, "People's War under Modern Conditions": A Doctrine for Modern War, The China Quarterly, No. 112, 556; also see Savita Pande, Chinese nuclear doctrine, *Strategic Analysis*, Vol. 23, No. 12, 2014
[402] Ellis Joffe, (1979), "The Army after Mao," *International Journal*, Vol. 34, No. 4, (1979), 568
[403] Lansky, "'People's War' and the Soviet Threat," 619-649; Ellis Joffe, "People's War under Modern Conditions": A Doctrine for Modern War, *The China Quarterly*, No. 112, (1987), 556;
[404] Ellis Joffe, "'People's War' under Modern Conditions," 556-555
[405] Ibid
[406] John Wilson Lewis and Xue Litai, *China's Strategic Seapower: The Politics of Force Modernisation in the Nuclear Age,* (Stanford: Stanford University Press, 1994), 5
[407] Ibid., 211-214
[408] Savita Pande, "Chinese nuclear doctrine," *Strategic Analysis*, Vol. 23, No. 12, (2000), 2011-2036
[409] M. Taylor Fravel, Active Defense: China's Military Strategy since 1949 (Princeton, NJ.: Princeton University Press, 2019), 139-181
[410] Shulong Chu, "The PRC Girds for Limited High Tech War", *Orbis*, (1994) 185-190
[411] Ibid

Second, China's growing new economic and industrial centers were becoming vulnerable, leading to the emphasis on 'positional offense' or 'forward defense' – a military concept that calls for engaging and repulsing adversary's military aggression closer to the border to defend territory. As there were chances of limited war, therefore, to withstand the adversary's attack with limited objectives (destruction of military and civil centers), it would be important to force the adversary to endure a high rate of attrition from the beginning to stop it from achieving objectives quickly. Third, strategic maneuvering for 'luring deep the enemy' was unlikely to be actioned.[412] As the concept of luring the adversary inland was considered less favorable (given new military technologies) than defeating the adversary at the borders, and vacating the cities for fighting a war was considered less beneficial than defending the cities.

2.11.3 Understanding Local Wars under Modern High-Tech Conditions

The strategic guideline of 'Local Wars under Modern High-Tech Conditions' was advanced by implementing the strategic idea of active defense to meet the emerging security needs of the post-Cold War and the post-Gulf War era.[413] Former Chinese President Jiang Zemin approved this new strategic guideline in 1993.[414] The *Science of Military Strategy* published by China's National Defense University (NDU) in 1999 defines a local war as "war with limited objectives in a part of an area where limited armed force is used."[415] Such local wars were based on the logic that shortly after the end of the Cold War and the Gulf War, China must be prepared to fight low-intensity conflicts frequently, which can be highly intense, mobile, and destructive because of the mounting military capabilities of regional states.[416] The change of conventional warfare strategies opened up the way for new developments in nuclear warfare strategy. The following section explains the emergence of the nuclear weapons doctrine in China in the late 1990s.

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[412] Ibid., 1985

[413] David Shambaugh, *Modernizing China's Military: Progress, Problems, and Prospects*, (Berkeley: University of California Press, 2002), 56-94; Alexander Huang, "Transformation and Refinement of Chinese Military Doctrine: Reflection and Critique on the PLA's View," in *Seeking Truth from Facts: A Retrospective on Chinese Military Studies in the Post Mao Era*, eds., James C. Mulvenon and Andrew N. D. Yang, (Santa Monica, CA: RAND, 2001), 131- 141; Yao Yunzhu, "The Evolution of Military Doctrine of the PLA from 1985 to 1995," *The Korean Journal of Defense Analysis*, Vol. 7, No. 2, (1995), 57-80

[414] Ibid; M. Taylor Fravel, "China's New Military Strategy: Winning Informationized Local Wars," *China Brief*, Vol. 15, Issue 13, July 2, 2015, accessed December 15, 2021, https://jamestown.org/program/chinas-new-military-strategy-winning-informationized-local-wars/

[415] Wang Wenrong, ed., *Zhanlüexue [Science of military strategy*], (Beijing: NDU Press, 1999)

[416] Savita Pande, "Chinese Nuclear Doctrine," 2016

2.12 Nuclear Weapons Doctrine Development after the Cold War

To maximize its ability to deter nuclear blackmail and intimidation, China could have, ideally, formulated a coherent nuclear weapons-use doctrine laying out the operational efficacy of nuclear weapons shortly after the first successful nuclear weapons test; however, there was no coherent nuclear weapons use doctrine published.[417] This was due to the interplay of external and internal impediments, factors identified by neoclassical realists, as discussed above.

In 1987, the PLA's Strategic Missile Forces (SMF) began research on nuclear strategy for warfighting by initiating a research program on nuclear campaign theory (*zhanyi lilun*). The primary purpose of this research was to focus on operational issues related to the effects of military technology on nuclear retaliation, the nature and type of nuclear retaliation, the use of nuclear weapons, nuclear campaigns and command and control, the political implications of the nuclear campaigns, survivability of nuclear forces under nuclear attack, and the nature and conditions of an adversary's first strike.[418] In the same year, the Military Studies Research Institute of the PLA Navy initiated a research program on the application of Submarine Launched Ballistic Missiles (SLBMs) for retaliation under both independent and joint operations in coordination with the SMF.[419]

After the broad stipulation of nuclear policy in 1964, it was the 2006 Defense White Paper (DWP) of China that presented the first official description of nuclear weapons strategy. It notes that China pursues a "self-defensive nuclear strategy," subject to its nuclear policy.[420] The DWP highlighted that self-defensive nuclear strategy is based on two principles; "counterattack in self-defense and "limited development of nuclear weapons."[421] Moreover, the DWP states that China "endeavors to ensure the security and reliability of its nuclear weapons and maintains a credible nuclear deterrent force."[422]

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[417] Alastair Iain Johnston, "Prospects for Chinese Nuclear Force Modernization: Limited Deterrence versus Multilateral Arms Control," *The China Quarterly*, *Special Issue: China's Military in Transition*, No. 146, (June 1996), 552

[418] Liu Tieqing, Rong Jiaxin, and Chang Jinan, eds., "Our views on the structure of the campaign theory of the Strategic Missile Forces," in *NDU Research Department*, *New Explorations of the Basic Theory of Campaigns* (Beijing: NDU Press, 1989), 323-324

[419] Ibid., 206-207; Alastair Iain Johnston, "Prospects for Chinese Nuclear Force Modernization: Limited Deterrence versus Multilateral Arms Control" in David Shambaugh and Richard H. Yang (eds.) *China's Military in Transition* (Clarendon Press, Oxford, 1999), 291

[420] Information Office of the State Council of the People's Republic of China, *China's National Defense in 2006* (Beijing, 2006), 9-10 http://www.andrewerickson.com/wp-content/uploads/2019/07/China-Defense-White-Paper_2006_English-Chinese_Annotated.pdf

[421] Ibid., 10

[422] Ibid

Cunningham and Fravel wrote the self-defensive nuclear strategy reflected that China pursues a strategy of assured nuclear retaliation.[423] Assured nuclear retaliation relies on the threat of inflicting unacceptable damage after the adversary's first strike to deter it from launching a first strike.[424] The second principle of the limited development of nuclear weapons shows that China seeks to develop enough nuclear weapons that, after absorbing a first strike, it would have enough nuclear weapons to retaliate and impose unacceptable damage.

Chinese nuclear experts express different views on China's nuclear strategy. For example, Li Bin views it as a counter-nuclear coercion strategy; Shen Dingli and Yao Yunzhu view it is one type of minimum deterrence; Sun Xiangli writes it is a defensive deterrence based on NFU, and Wu Riqiang asserts that it projects first-strike uncertainty.[425] Though the scholars' views may be different, all the DWP (2008, 2010, 2013, 2015, 2019) share the same self-defensive nuclear strategy, as discussed in detail in Chapter Five.[426]

2.13 Chinese Nuclear Force Capabilities (1991-2000)

According to the *Bulletin of the Atomic Scientists*, China had 234 nuclear warheads in 1991.[427] Land-based (missile) nuclear forces were the most substantial element of the Chinese nuclear triad at that time. According to the International Institute for Strategic Studies (IISS) report, *Military Balance 1995-1996*, China had more than 17 intercontinental ballistic missiles (ICBMs) in 1991. Out of these, 7 were DF-5 (CSS-4) ICBMs and the remaining 10 were DF-4 (CSS-3) IRBMs.[428] Both IRBMs and ICBMs were capable of carrying nuclear warheads. The DF-5 had a range of 13,000km, capable of targeting anywhere in the US and Western Europe. [429] The DF-4 had a range of 4,500-

[423] Fiona S. Cunningham and M. Taylor Fravel, "Assuring Assured Retaliation: China's Nuclear Posture and U.S.-China Strategic Stability," *International Security*, Vol. 40, No. 2, (2015), 13-14
[424] M. Taylor Fravel and Evan S. Medeiros, "China's Search for Assured Retaliation: The Evolution of Chinese Nuclear Strategy and Force Structure," *International Security*, Vol. 35, No. 2, (2010), 48-87; Vipin Narang, *Nuclear Strategy in the Modern Era : Regional Powers and International Conflict* (Princeton, N.J.: Princeton University Press, 2014)
[425] Competing views are discussed in Michael S. Chase, "China's Transition to a More Credible Nuclear Deterrent: Implications and Challenges for the United States," *Asia Policy*, Vol. 16, No. 1, (2013), 69-101
[426] China Defense White Papers—1995-2019, *Andrew S. Erickson*, July 23, 2019, accessed December 15, 2021, https://www.andrewerickson.com/2019/07/china-defense-white-papers-1995-2019-download-complete-set-read-highlights-here/
[427] Hans M. Kristensen and Robert S. Norris, "Global nuclear weapons inventories, 1945–2013," *Bulletin of the Atomic Scientists*, Vol. 69, No. 5, (2013), 75-8
[428] *The Military Balance* (IISS, London, 1995), 176
[429] Missile Defense Project, DF-5 (Dong Feng-5 / CSS-4), *Missile Threat*, Center for Strategic and International Studies, August 12, 2016, last modified November 18, 2019, accessed July 26, 2021, https://missilethreat.csis.org/missile/df-5-ab/; Missile Defense Project, DF-5, *Missile Threat*, Center for

5,500km, and if placed strategically, the DF-4 is capable of striking Moscow, Guam, and India.[430]

Similarly, by 1995, China had only one *Xia* – nuclear submarine (SSBN) – equipped with a dozen JL (CSS-N-3) class submarine-launched ballistic missiles (SLBMs) capable of engaging targets at a distance of 1,700km.[431] The PLA Navy also developed JL-2 class SLBMs, but the numbers of SLBMs remained unknown. The PLA Air Force, by 1995, had 200 H-5 class deployed strategic bombers with the capacity of delivering 2000 kilograms (KG) of payload at a distance of 1,200km. Deployed 100 H-6 class strategic bombers were capable of carrying a payload of 4,500kg to a distance of 3,100km.[432] However, these bombers were not capable of penetrating deep into the adversary's air defense systems because of their vulnerability to US and Russian air defense systems and fighter jets.[433]

By 2000, China had 40 nuclear-capable DF-3A with a 2,800km range. 20 DF-4 with a 5,500km range, 20 DF-5A with a 13,000km range, and 48 DF-21A with a 1,800km range. However, none of these missiles were capable of MIRVing.[434] Developed in the early 1960s, Multiple Independently-targetable Re-entry Vehicles (MIRVs) allow a single missile to deliver multiple nuclear warheads to different targets at different speeds and directions.[435]

2.14 A Disconnect between Doctrine and Capabilities

The literature on China's nuclear program shows that in the 1990s, Chinese policymakers were more inclined towards a limited deterrence doctrine.[436] However, China's nuclear

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Strategic and International Studies, August 12, 2016, last modified August 2, 2021, https://missilethreat.csis.org/missile/df-5-ab/

[430] Ibid, Robert Walpole "New Declassified Report Of Ballistic Missile Threat", *Proliferation Brief*, (Carnegie Endowment's Non-Proliferation Programme 1998, Washington D.C) Vol.1, No.13

[431] *The Military Balance*, 1995, 176

[432] *The Military Balance*, 1995, 178

[433] Ibid

[434] "Chinese Nuclear Forces, 2001," *Bulletin of the Atomic Scientists*, Vol. 57, No. 5, (2001) 71-72

[435] Fact Sheet: Multiple Independently-targetable Reentry Vehicle (MIRV), *Center for Arms Control and Non-Proliferation*, August 28, 2017, accessed December 15, 2021, https://armscontrolcenter.org/multiple-independently-targetable-reentry-vehicle-mirv/

[436] Alastair Iain Johnston, "Prospects for Chinese Nuclear Force Modernization: Limited Deterrence versus Multilateral Arms Control" in David Shambaugh and Richard H. Yang eds. *China's Military in Transition* (Oxford: Clarendon Press, 1999), 294-95; J. Mohan Malik, "Chinese debate on military strategy: trends and portents," *Journal of Northeast Asian Studies* (Summer 1990); Chong-pin Lin, *China's Nuclear Weapons Strategy: Tradition within Evolution* (Lexington: Lexington Book, 1988); Alastair lain Johnston, "China's New 'Old Thinking': The Concept of Limited Deterrence," *International Security*, Vol. 20, (1995/1996), No. 3; Wilson Lewis and Hua Di, "China's ballistic missile programs: technologies, strategies, goals," *International Security*, Vol. 17, No. 2, (Fall, 1992), 4-6; Xue Litai, "Evolution of China's nuclear strategy,"

inventory of the 1990s lacked the capacity to support this doctrine.[437] A limited deterrence doctrine requires a mix of both counterforce and counter-value capabilities. Alastair Johnston, writing in 1995, explains,[438]

> The list of what Chinese strategists consider to be legitimate targets [in 1995] in a nuclear war is quite long: enemy [the US and Russia] strategic missile bases, naval and air bases, troop concentrations, command and control centres, strategic warning and defence systems, transportation hubs, industrial targets, as well as political and economic centres - that is, a mix of hard and soft counterforce and countervalue targets.[439]

Despite the long list of potential enemies and targets, China's ballistic missile inventory remained limited in early 2000. At this time, it had only 20 DF-5A ICBMs capable of reaching the continental US.[440] Given the sheer size of the US nuclear weapons inventory at this time (550 ICBM launchers, approximately 400 SLBMs, and 100 strategic bombers) dwarfed China's nuclear forces, Beijing was vulnerable to a first strike.[441] This was especially the case, given China's missiles were liquid-fuelled. In liquid-fuelled missiles, the fuel and oxidizer are kept separate until right before deployment, which takes hours depending upon the type of missile, whereas, in solid-fuelled missiles, fuel and oxidizer are kept together, therefore, requiring less maintenance and preparation time.[442] In short, China's limited nuclear inventory was not sufficient to implement a limited deterrence doctrine. A mismatch existed between China's nuclear doctrine and the nuclear inventory required to implement this doctrine. China would proceed to rectify this in subsequent years, as discussed in subsequent chapters.

2.15 Conclusion

This chapter has examined the evolution of China's nuclear weapons program from 1949 until 2000. Mao's assertion that nuclear weapons were a paper tiger was changed by the overt nuclear threat and blackmail from the US in three crises that occurred one after another in a single decade: the Korean War (June 1950-July 1953), the First Cross-Straits Crisis (September 1954 to May 1955) and the Second Cross-Strait Crisis (1958). China

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in John C. Hopkins and Weixing Hu eds., *The View from the Second Tier: The Nuclear Weapons Policies of Britain, France and China* (San Diego: Institute of Global Conflict and Cooperation, 1994), 180

[437] Alastair Iain Johnston, *Prospects for Chinese Nuclear Force Modernization*, 294-95

[438] Johnson, "China's New Old Thinking," 5

[439] Johnston, *Prospects for Chinese Nuclear Force Modernization*, 556

[440] Johnson, "China's New Old Thinking"; Johnston, *Prospects for Chinese Nuclear Force Modernization*

[441] Robert S. Norris and William M. Arkin, NRDC Nuclear Notebook U.S. Nuclear Forces, 2000, Vol. 56, No. 3, (2000), 69-71

[442] Kelsey Davenport, "Worldwide Ballistic Missile Inventories," *Arms Control Association*, December 2017, accessed December 16, 2021, https://www.armscontrol.org/factsheets/missiles

realized its goal of nuclearization through extensive technical cooperation with the Soviet Union in the 1950s. After the Sino-Soviet split in 1959, Beijing suffered a considerable setback in its nuclear weapons development. Khrushchev's decision to rescind the nuclear weapons and related technology support agreements with Beijing was a severe blow to China's nuclear industry, specifically to its nuclear weapons program. Many projects and operations were delayed or put on hold as China lacked the required critical infrastructure and expertise. China had to resolve various issues "related to modeling and designs, and equipment manufacturing and installation to indigenously build the nuclear-fuel-element plant."[443] Nonetheless, it is also true that if the Soviet Union had not signed six agreements with China to provide them with nuclear weapons and related technology, it would have been difficult for China to test a nuclear warhead successfully as early as 1964.

As for the delay in developing a nuclear doctrine, both external and internal factors were involved. The reduction in the perceived level of the external threat after China acquired its own nuclear weapons was the main factor that led to the delay. Additionally, its bureaucratic political authoritarianism and the view that nuclear weapons had only limited utility, appeared to be secondary reasons which kept China's nuclear weapons use doctrine underdeveloped from the late 1960s to the mid-1990s. Mao and Deng, who dominated the political landscape of China throughout this period, remained in favor of conventional warfighting approaches, such as *people's war* and *active defense*, until the death of Mao.

Chinese leaders were willing to accept a high degree of vulnerability to their smaller nuclear forces for many decades. Perhaps the reason behind this willingness to accept vulnerability was that China did not engage in direct conflict with the US after the Second Cross-Strait Crisis. China against the USSR had attained the capability to engage in a nuclear conflict. By 1969 China had 50 nuclear weapons, so the leaders ruled out the possibility of nuclear war despite a limited border conflict with the Soviet Union in 1969, as discussed in detail in the next chapter.[444]

After the 1964 nuclear test, China announced a nuclear policy based on NFU and unconditional negative security assurances against non-nuclear states and nuclear

[443] Liu Yangqiong and Liu Jifeng, "Analysis of Soviet Technology Transfer in the Development of China's Nuclear Weapons," *Comparative Technology Transfer and Society*, Vol. 7, No. 1, (2009), 95
[444] Hans M. Kristensen and Robert S. Norris, Global nuclear weapons inventories, 1945–2013, *Bulletin of the Atomic Scientists*, Vol. 69, No. 5 (2013), 75-81

weapon-free zones and that it would use nuclear weapons in retaliation only. According to some experts, after a gap of almost three decades, China had developed a nuclear doctrine of limited deterrence by the end of the Cold War.[445] China officially published the doctrine "self-defensive nuclear strategy" in the 2006 Defense White Paper, which was based on counters of the nuclear policy announced in 1964, after nuclear tests.

Some informed Chinese analysts this author spoke to for this research on China's nuclear weapons program never appeared to be satisfied with the limited deterrence doctrine.[446] Their dissatisfaction appeared to stem from two reasons. Internally China, as noted above, could not operationalize its limited deterrence doctrine. Externally the emerging ballistic and theatre missile defense capabilities of other states, especially the US, made the operational utility of a limited deterrence doctrine questionable, as discussed in detail in Chapter Eight.

The next two chapters use neoclassical realism's two levels of analysis to consider the drivers of change in China's nuclear weapons program from 1964 to 2000. Chapter Three considers the external or structural factors, while Chapter Four examines the internal drivers. Chapter Three examines the external strategic environment of China that informs its threat perception. This played a crucial role in the development of China's nuclear weapons program. It examines the capabilities and intent of nuclear weapons states with the potential to harm China. Chapter Four examines the role of internal drivers in the development of China's nuclear weapons program. This includes economic development, emerging bureaucratic competition between different organizations of the PLA, and most importantly, the role of the individual, that is, the role of president Xi Jinping.

[445] Johnston, "Prospects for Chinese Nuclear Force Modernization," 294-95; Malik, "Chinese debate on military strategy"; Lin, *China's Nuclear Weapons Strategy*; Johnston, "China's New Old Thinking"; Lewis and Di, "China's ballistic missile programs," 4-6; Litai, "Evolution of China's nuclear strategy," 180
[446] Author discussion with Chinese analysts

Chapter Three

China's Nuclear Weapons Force Modernization: Structural Drivers of Change

3.1 Introduction

According to neoclassical realism, China's nuclear weapons program and force modernization are driven by structural/external and internal factors. This chapter focuses on the structural level of analysis, holding that China's *nuclear threat perception*, of which its nuclear weapons and force modernization is the by-product, stems from regional and international security dynamics where the US, Russia, and India are key players driving China's decision-making.[447] Analysis of nuclear dyads can help us understand China's nuclear threat perception, but it does not cover every aspect that contributes to its threat perception. Moreover, dyadic analysis of nuclear relations is difficult to comprehend without considering an overlapping multidimensional nuclear deterrence framework, also known as the new "geometry of deterrence," that better considers the complexities of the modern international system.[448]

The chapter examines China's changing nuclear threat perception. Moreover, it considers how security has assumed a new shape and meaning for China. An inventory of China's nuclear threat perception will enable us to explore China's rationale for the particular type of nuclear weapons policy and force modernization it has adopted, outlined in Chapter Five.

The scope of the chapter is limited to the US, Russia, and India because China has unique relations with them. China has been engaged in conflicts and crises involving the US and Russia, wherein nuclear weapons shaped the course of events. Though with Russia, China's relations have improved in recent years, Russia has a massive nuclear inventory, and China's growing share of the global distribution of power and influence in Russia's backyard could negatively affect bilateral relations. US-China relations are unstable (as

[447]* China's geostrategic location makes it vulnerable to most of the nuclear powers, including France and the United Kingdom as they have ballistic missile submarine (SSBNs) capable of deploying submarine-launched ballistic missiles (SLBMs) with nuclear warheads. However, these states are now central to China's nuclear threat perception Michael Clarke, "Does My Bomb Look Big in This? Britain's Nuclear Choices after Trident," *International Affairs* (Royal Institute of International Affairs 1944-), Vol. 80, No. 1, (2004), 49-62; French Submarine Capabilities, *Nuclear Threat Initiative*, October 9, 2019, accessed January 16, 2020, https://www.nti.org/analysis/articles/france-submarine-capabilities/

[448] Lester R. Kurtz, "The Geometry of Deterrence," *Peace Review*, Vol. 6, No. 2, (1994), 187-194

they were in the past, as discussed earlier), and the US has identified China as its primary great power competitor. Secondarily China's ties with Japan and South Korea are fraught. The US is also involved in forming a regional bulwark against China via the Quadrilateral Security Dialogue (QUAD) involving Australia, India, and Japan. Washington is also forming new security pacts such as AUKUS, (involving Australia, UK, and the US). Lastly, India and China have fought a war and many border skirmishes on different borders in disputed regions. Their border disputes have the potential to escalate into a nuclear crisis. Given these circumstances, the chapter's scope covers China's evolving threat perception related to these nuclear weapons states.

The first section of the chapter outlines the theoretical underpinnings of threat perception. It then examines China's perceived nuclear threat from Russia, India, and the US. The chapter concludes that it is primarily the US that shapes China's nuclear threat perception. The emerging developments in US military policy and capabilities, and its role in the Indo-Pacific region are motivating China to alter its nuclear weapons policy, enhance its military capabilities, and modernize them.

3.2 Historical Background

Until the end of the Cold War, China was considered outside the scope of efforts by the US and Soviet Union (and later Russia) to regulate strategic capabilities via nuclear arms control and nuclear non-proliferation. There are several reasons for this, such as China's historically relatively weak and developing nuclear weapons program; the Cold War bipolar competition between the US and the Soviet Union; their immense relative advantage in nuclear capacity compared to China; China's commitment to a restrained nuclear weapons policy and the *NFU policy*; China's isolationist/selective engagement policy, and lastly, the US and Soviet primacy in conventional warfare. With the end of the Cold War, the role of nuclear weapons between states generally became less salient in international politics, especially throughout much of the 1990s, and its role in the US and Russian security policies remained uneven, while concerns over loose nukes and nuclear terrorism rose (especially after 9/11).[449]

[449] Bunn, Matthew, and Anthony Wier, "The Seven Myths of Nuclear Terrorism" in Russell D. Howard and James Forest eds. *Weapons of Mass Destruction and Terrorism* (New York: McGraw-Hill, 2007), 153-161

China initiated a process of general military modernization after the end of the Cold War. The US 'victory' over the Soviet Union, and display of its advanced military capabilities in the First Gulf War, Washington's military aid to Taiwan, and the US-led anti-China campaign over the Tiananmen Square incident all raised alarms in Beijing.[450] These events informed China's strategic thinking and spurred its general military modernization. Concerning China's strategic missile inventory modernization, China's nuclear-capable short-range ballistic missile (SRBM) DF-11 with, a range of 300km, became operational in 1992 with the then-Second Artillery Force (SAF), deployed opposite Taiwan.[451] The DF-11A, with an increased range of 500-600km, became operational in 1998.[452] China also began to include nuclear-capable cruise missiles in its inventory. The Hong Niao 1 (HN-1) cruise missiles were introduced into service in 1996 with a range of 600km and capable of carrying 400kg of payload.[453] Later its air-launch version entered into service in 2001. The ground and ship versions of HN, known as the HN-2A and the HN-2B, respectively, entered into service after one year in 2002, with an improved range of 1800km and a payload capacity of 1400kg. The HN-3A (ground and ship-based) and the HN-3B (submarine launch cruise missile-SLCM), with respective ranges of 3000km and 2200km and payload capacity of 1800kg, entered into the SAF in 2007.[454] Similarly, China operationalized a family of DF-21 medium-range ballistic missiles (MRBM); the

[450] Harlan W. Jencks, "Chinese Evaluations of 'Desert Storm': Implications For PRC Security," *The Journal of East Asian Affairs*, Vol. 6, No. 2 (Summer/Fall 1992), 447-477; Robert Farley, "China Has Not Forgotten the Lessons of the Gulf War," *The National Interest*, September 1, 2021, accessed October 1, 2021, https://nationalinterest.org/blog/reboot/china-has-not-forgotten-lessons-gulf-war-192949; Lindsay Maizland, "China's Modernizing Military," *CFR*, February 5, 2020, accessed September 2, 2021, https://www.cfr.org/backgrounder/chinas-modernizing-military; Bush Announces Sale Of F-16 Aircraft To Taiwan, 1992 (Portion of President Bush's September 2 speech at the General Dynamics factory in Fort Worth, Texas) USC *US-China Institute*, September 2, 1992, accessed October 2, 2021, https://china.usc.edu/bush-announces-sale-f-16-aircraft-taiwan-1992; Taifa Yu, "The Conduct of Post-Tiananmen U.S. China Policy: Domestic Constraints, Systemic Change, and Value Incompatibility," *Asian Affairs: An American* Review, Vol. 19, No. 4 (Winter, 1993), 229-247

[451] DF-11 (CSS-7/M-11) in *IHS Jane's Weapons: Strategic 2015-2016*, ed. James C. O'Halloran (United Kingdom: IHS, 2015), 9-11

[452] Missile Defense Project, "DF-11 (Dong Feng-11 / M-11 / CSS-7)," Missile Threat," *Center for Strategic and International Studies*, January 29, 2018, last modified June 23, 2020, https://missilethreat.csis.org/missile/dong-feng-11/

[453] C-602 (HN-1/-2/-3/YJ-62/X-600/DH-10/CJ-10/HN-2000), in *IHS Jane's Weapons: Strategic 2015-2016*, ed. James C. O'Halloran (United Kingdom: IHS, 2015), 115-119

[454] Hans M. Kristensen and Robert S. Norris, "Chinese Nuclear Forces, 2016," *Bulletin of American Scientists*, Vol. 72, Issue 4, 2016, http://www.tandfonline.com/doi/full/10.1080/00963402.2016.1194054; "Missile Defense Project, Hong Niao Series (HN-1/-2/-3), Missile Threat," *Center for Strategic and International Studies*, August 12, 2016, last modified November 26, 2019, accessed May 3, 2020, https://missilethreat.csis.org/missile/hong-niao/

DF-21 in 1991, DF-21A in 1996, DF-21C – a conventional version of DF-21, and DF-21D, also known as the 'carrier killer'.[455]

The general modernization of China's strategic inventory after the Cold War was primarily focused on regional contingencies, as indicated by the aforementioned missiles not having the capability to conduct intercontinental strikes. The DF-5 was the only ICBM that China had by 1991, with a range of 13,000km. It entered into service in 1981.[456] It took China almost 21 years to operationalize its second ICBM, the DF-31, with a range of 7,000-8,000km. It entered into service with the SAF in 2006. Then, in 2007, the DF-31A entered into service with a range of 11,000km.[457]

With President Xi Jinping coming to office in 2013, China's nuclear missile inventory began to diversify.

Table 3. China's Nuclear Missile Inventory Since 1991[458]

Missile	Class	Range (kms)	Status	Year Deployed
DF-4	IRBM/ICBM	4,500 - 5,500km	Operational	1980
DF-5	ICBM	12,000km	Operational	1981
DF-15	SRBM	600km	Operational	1991
DF-21	MRBM	2,150km	Operational	1991
DF-11	SRBM	280 - 300km	Operational	1992
DF-31	DF-31 ICBM	7,000 - 8,000km	Operational	2006
	DF-31 A ICBM	11,000km	Operational	2007
Xi Jinping became president of China in 2013				
DF-16	SRBM	800 - 1,000km	Operational	2012 (unveiled 2015)
DF-12	SRBM	280km	Operational	2013
JL-2	SLBM	8,000 - 9,000km (3-8 MIRVs)	Operational	2015
DF-5	DF-5B ICBM	12,000km (3 MIRVs)	Operational	2015
DF-26	IRBM	4,000km	Operational	2016

[455] "DF-21," in *IHS Jane's Weapons: Strategic 2015-2016*, ed. James C. O'Halloran (United Kingdom: IHS, 2015), 15-17; Missile Defense Project, "DF-21 (Dong Feng-21 / CSS-5)," Missile Threat, *Center for Strategic and International Studies*, April 13, 2016, last modified January 2, 2020, accessed May 3, 2020, https://missilethreat.csis.org/missile/df-21/

[456] Dong Feng-5 (CSS-4), Sino Defense, https://sinodefense.com/rocketry/df5/; Missile Defense Project, DF-5 (Dong Feng-5 / CSS-4), *Missile Threat*, Center for Strategic and International Studies, August 12, 2016, last modified November 18, 2019, accessed May 3, 2020, https://missilethreat.csis.org/missile/df-5-ab/

[457] Missile Defense Project, DF-31 (Dong Feng-31 / CSS-10), *Missile Threat*, Center for Strategic and International Studies, August 12, 2016, last modified August 9, 2021, accessed December 19, 2021, https://missilethreat.csis.org/missile/df-31/

[458] Missile Defense Project, "Missiles of China," *Missile Threat*, Center for Strategic and International Studies, June 14, 2018, last modified April 12, 2021, accessed December 23, 2021, https://missilethreat.csis.org/country/china/.

DF-31	DF-31 AG	11,000km	Operational	2017
DF-5	DF-5C ICBM	12,000km (10 MIRVs)	Operational	2017
DF-17	HGV	1,800 - 2,500km	Operational	2019
DF-41	ICBM	12,000 - 15,000km (10 MIRVs)	Operational	2019

By 2016, China had new and improved missiles in its inventory, including eight DF-31, 25 DF-31A, 10 DF-5A, 10 (x3 MIRV) DF-5B, and 10 (x10 MIRV) DF-5C.[459] This significant increase in China's strategic ICBM inventory came after President Xi introduced a series of reforms soon after taking office. However, the more significant announcements regarding reforms related to modernization and the structure of the PLA were made in December 2015, are discussed in detail in Chapter Five.

China continues to modernize its nuclear forces. Recently, on October 1, 2019, while celebrating its seventieth anniversary at Tiananmen Square, it displayed several state-of-the-art weapons and delivery systems.[460] Among the showcased weapons systems were the DF-41, DF-31AG, JL-2, DF-26, DF-17 hypersonic glide vehicle (HGV), DF-100 hypersonic cruise missile, and the WZ-8 supersonic reconnaissance drone.[461] In addition, in December 2015, the Second Artillery Force (SAF) - a branch of the PLA responsible for handling nuclear weapons - was renamed the PLA Rocket Force (PLA-RF). Apart from restructuring, the PLA-RF was upgraded to full military service as per other services, such as the PLA Army, Air Force, and Navy (previously, it was a military branch) by President Xi Jinping.[462]

The vulnerable geostrategic location of China is further spurring the modernization that is taking place in its nuclear weapons program. Neighboring regions of China include several nuclear weapons states which are prone to overlapping territorial conflicts and include formal security arrangements with one another. This includes multiple territorial disputes in the South and the East China Sea, the Quadrilateral (US, Japan, India, and

[459] Missile Defense Project, DF-5 (Dong Feng-5 / CSS-4), *Missile Threat*, Center for Strategic and International Studies, August 12, 2016, last modified November 18, 2019, accessed May 3, 2020, https://missilethreat.csis.org/missile/df-5-ab/; Missile Defense Project, DF-31 (Dong Feng-31 / CSS-10), *Missile Threat*, Center for Strategic and International Studies, August 12, 2016, last modified October 8, 2019, accessed May 3, 2020, https://missilethreat.csis.org/missile/df-31/

[460] "China Lifts the Veil on Its Advanced Weaponry," *Stratfor*, October 3, 2019, accessed October 26, 2019, https://worldview.stratfor.com/article/china-lifts-veil-its-advanced-weaponry-military-parade

[461] Ibid; "China Showcases New DF-100 Hypersonic Cruise Missile at National Day Military Parade," *Sputnik*, October 1, 2019, accessed December 13, 2019, https://sputniknews.com/military/201910011076931912-china-showcases-new-df-100-hypersonic-cruise-missile-at-national-day-military-parade/

[462] Kelsey Davenport, "China Elevates Nuclear Rocket Force," March 2016, accessed December 15, 2019 https://www.armscontrol.org/act/2016-03/news/china-elevates-nuclear-rocket-force

Australia) Security Dialogue (QUAD), the North Korean nuclear challenge, the China-Taiwan issue, and China's growing power and its implications for the broader Indo-Pacific region.

States such as Japan - a 'latent' nuclear power, also enjoy extended nuclear deterrence vis-à-vis China provided by the US.[463] Nuclear latency is a possession of all the capabilities required to develop nuclear weapons but without full operational weaponization.[464] According to some reports, Japan can build nuclear weapons in as little as six months, if it chooses to do so.[465] In such circumstances, China's threat perception directly affects the development of its nuclear forces and strategy. This may have cascading effects on regional and international stability as other states, in turn, feel an increased threat from China's growing capabilities and seek to match or offset it with their own capabilities. China's threat perception and emerging capabilities to counter security threats exist in an interconnected relationship with the security of other major and nuclear powers surrounding it. The next section examines the theoretical underpinnings of threat perception, followed by the historical evolution of China's threat perception.

3.3 China's Nuclear Threat perception

Threat perception can significantly influence and inform the security policy of a state. An acute sense of external threat can lead to greater internal cohesion, potentially leading to aggressive responses to perceived or actual foreign threats and hard and soft balancing.[466] Hard balancing is based on traditional power balancing using military capabilities and formal security alliances (e.g. NATO and AUKUS) to tilt the strategic balance in one's

[463] Joseph F. Pilat, "Exploring Nuclear Latency," *Wilson Center*, October 2, 2014, accessed December 19, 2021, https://www.wilsoncenter.org/publication/exploring-nuclear-latency
[464] Ibid
[465] Patrick Winn, "Japan has plutonium, rockets and rivals. Will it ever build a nuke?," *PRI*, March 14, 2019, accessed January 30, 2022, https://interactive.pri.org/2019/03/japan-nuclear/index.html; Robert Windrem, "Japan Has Nuclear 'Bomb in the Basement,' and China Isn't Happy," *NBC News*, March 11, 2014, accessed January 30, 2022, https://www.nbcnews.com/storyline/fukushima-anniversary/japan-has-nuclear-bomb-basement-china-isn-t-happy-n48976; Federation of American Scientists, "Japan Special Weapons Guide: Nuclear Weapons Program" Updated June 1, 2012, accessed December 20, 2019, www.fas.org/nuke/guide/japan/nuke
[466] Reuben Steff and Nicholas Khoo, "Hard Balancing in the Age of American Unipolarity: The Russian Response to US Ballistic Missile Defense during the Bush Administration (2001–2008)," *Journal of Strategic Studies*, Vol. 37, No. 2 (2014), 222-258; Marilynn Brewer, "Psychology of Prejudice: Ingroup Love or Outgroup Hate?" *Journal of Social Issues*, Vol. 55, No. 3, (1999) 439-444; Martha Cottam & Richard Cottam, *Nationalism and politics: The political behavior of nation states* (Boulder, CO: Lynne Rienner, 2001); Howard Lavine, Milton Lodge & Kate Freitas, "Threat, Authoritarianism, and Selective Exposure to Information." *Political Psychology*, Vol. 26, No. 2, (2005) 219-244

favor or to lessen an imbalance weighted against oneself.[467] Soft balancing involves non-military policies to curtail and offset the balance. Soft balancing relies on institutions, diplomatic coalitions, and economic sanctions.[468] Soft balancing is different from soft power, which is referred to as a state's attributes, including social, cultural, economic, or political resources. Soft power is the use of these attributes by a state to induce or encourage other states to adopt policies that are favorable to them.

The realist school of international relations and conflict theorists in social psychology assert that *perception* is important in terms of how states view security threats.[469] Power asymmetries play a significant role here as the greater the power asymmetry between states, the higher, often, the perceived threat level. In the 1980s, several international relations scholars focused on the psychological factors involved in threat perception, and *intention* became a key variable for understanding international relations. Waltz writes that military threats are assessed according to a range of objective and subjective factors that include the adversary's military power, offensive capabilities, physical or geographical proximity, and hostile intentions.[470] According to Robert Jervis and others, threat perception is defined as the capability and intent to inflict harm.[471] According to K. J. Holsti, "a capability is any physical or mental object or quality available as an instrument of inducement."[472] Later, in the mid-1980s, Stephen M. Walt developed the "balance of threat" theory and tried to explain the role of perception in alliance formation.[473]

According to the balance of threat theory, states form alliances to balance against a threat they perceive from a state, not against material power as the balance of power theorists posits.[474] According to Walt, a state's threat perception is informed by four factors; an

[467] T. V. Paul, *Restraining Great Powers: Soft Balancing from Empires to the Global Era* (New York & London: Yale University Press, 2018)1-9; Joseph S. Nye Jr., *Bound to Lead: The Changing Nature of American Power* (New York: Basic Books, 1990)
[468] Paul, *Restraining Great Powers, 1*-9; Nye, *Bound to Lead*
[469] Paul Kennedy, *The Rise and Fall of the Great Powers: Economic Change and Military Conflict from 1500 to 2000* (New York, NY: Random House, 2001); Kenneth Waltz, *Theory of International Politics* (New York, NY: Random House, 1979)
[470] Ibid, Waltz, 22
[471] Robert Jervis, *Perception and misperception in international politics.* (Princeton, NJ: Princeton University Press, 1976); Jie Chen, "Urban Chinese perceptions of threats from the United States and Japan." *Public Opinion Quarterly*, Vol. 65, No. 2, (2001), 254-266
[472] K. J. Holsti, "The Concept of Power in the Study of International Relations," *Background*, Vol. 7, No. 4, (1964), 179-194
[473] Stephen M. Walt, *The Origins of Alliances* (Ithaca, NY: Cornell University Press, 1990); Stephen M. Walt, "Alliance Formation and the Balance of World Power," *International Security* Vol. 9, No. 4, (Spring 1985) 3-43
[474] Walt, "Alliance Formation," 3-43

aggregate of national power (size of a state, population, economic capabilities and latent power), geographical closeness, offensive military capabilities, and aggressive intentions.[475] Together these factors possessed by an emerging power are likely to be viewed as a threat, and therefore states balance against it. Stephen Walt writes that during the Cold War, the US was more powerful than the Soviet Union, but NATO member states allied with the US, not the Soviet Union, contrary to the postulates of the balance of power theory.[476] Walt argues that it happened because the US intentions were less aggressive compared to the Soviet Union against these states.[477] However, [intentions] "are simply unknowable," as Mearsheimer says, "states have to think there is some possibility that other states have or will have aggressive intentions."[478] He further writes, "in an anarchic world where states have offensive military capabilities and might have offensive intentions, states have no choice but to fear each other."[479]

The mainstream international relations literature has several, and a growing number, of studies examining the nuclear potential, and potential threat, that some states perceive from China's growing military and economic power.[480] However, literature on China's perceived threat from other states is relatively less explored and comparatively outdated.[481] From the available two studies that could be found in the literature, one of

[475] Ibid
[476] Ibid
[477] Walt, Alliance Formation, 3-43
[478] "Conversations in International Relations: Interview with John J. Mearsheimer (Part II)," *International Relations* Vol 2, No. 2, (2006), 231–243
[479] Ibid
[480] Samuel Huntington, *Clash of Civilizations and the Remaking of World Order*. (New York, NY: Simon & Schuster, 1996); Herbet Yee and Ian Storey, (.eds) *The China Threat: Perceptions, Myths and Reality*. (London, United Kingdom: Routledge Curzon, 2002); John Mearsheimer, "China's Unpeaceful Rise." *Current History*, Vol. 105, Issue. 690, (April 2006), 160-162; Emma V. Broomfield, "Perceptions of Danger: The China Threat Theory," *Journal of Contemporary China*, Vol. 12, No. 35, (2006), 265-284; Denny Roy, "The "China Threat" Issue: Major Arguments," *Asian Survey*, Vol. 36, No. 8, (1996), 758-771; Gerald C. Brown, "Understanding the Risks and Realities of China's Nuclear Forces," *Arms Control Association*, June 2021, accessed July 27, 2021, https://www.armscontrol.org/act/2021-06/features/understanding-risks-realities-chinas-nuclear-forces; "How a Rising China has Remade Global Politics," *World Politics Review*, May 12, 2021, accessed July 27, 2021, https://www.worldpoliticsreview.com/insights/27828/how-a-rising-china-has-remade-global-politics; Jeffrey Lewis, "China is Radically Expanding Its Nuclear Missile Silos," *Foreign Policy*, June 30, 2021, accessed July 26, 2021, https://foreignpolicy.com/2021/06/30/china-nuclear-weapons-silos-arms-control/; "China could soon have latest nuclear weapons, says US diplomat," *DW News*, July 8, 2021, accessed July 26, 2021, https://www.dw.com/en/china-could-soon-have-latest-nuclear-weapons-says-us-diplomat/a-58210816; Eric Heginbotham, Michael S. Chase, Jacob L. Heim, Bonny Lin, Mark R. Cozad, Lyle J. Morris, Christopher P. Twomey, Forrest E. Morgan, Michael Nixon, Cristina L. Garafola, Samuel K. Berkowitz, *China's Evolving Nuclear Deterrent Major Drivers and Issues for the United States*, (Santa Monica, California: RAND Corporation, 2017), 1-160
[481] Susan Turner Haynes, "China's Nuclear Threat Perceptions," *Strategic Studies Quarterly*, Vol. 10, No. 2 (Summer 2016), 25-62; Xiaoping Yang, "China's Perceptions of India as a Nuclear Weapons Power," *Carnegie Edowment for International Peace (CEIP)*, June 30, 2016, accessed July 26, 2021,

the articles was written by a Chinese scholar. In contrast, more than 20 research pieces are available on China as a nuclear threat. Susan Turner Haynes' *China's Nuclear Threat Perception* is the only article that examines China's threat perception in detail. She carried out a state-by-state analysis of nuclear weapons states and US allies that have nuclear guarantees. Her study concludes that China's nuclear buildup is a direct response to the US Ballistic Missile Defense (BMD) system.[482] However, how China's threat perception is inducing nuclear force modernization in China was not considered. Moreover, the article was written in 2016. There have been many developments since then, such as the 2018 NPR, China's 2019 DWP and China's large-scale nuclear force modernization, the formation of new security alliances like AUKUS, and the revival of the QUAD. A recent commentary on the topic made by Chinese analyst, Tong Zhao, focuses on the recently discovered Chinese missile silos.[483] He concludes that it is the threat from the US which is driving China's nuclear buildup: however, he ignores the regional developments, which are the cause of China's sub-strategic nuclear force modernization. Though the regional developments cannot be divorced from the US security framework, regional states (Japan and South Korea) are now focusing on internal development more than ever before. (see Chapter Eight). The remainder of this chapter examines China's nuclear threat perception in the light of the above-mentioned new geopolitical realities, examining the US' latest nuclear posture review and China's responses to these developments in the shape of new deployments, which are not limited to only fields of new missile silos. The next section examines the level of capabilities and intent of states on China's threat perception.

China's Threat Perception: Capability and Intent Matrix[484]

Table 4 below shows where the US, Russia, and India stand in a matrix of capability and intention. Divided into three levels on the x-axis; high, medium, and low, the intent shows the level of willingness of a state to use force during a crisis against China. The low level reflects a peaceful intent wherein a state in conflict with China is unlikely to use nuclear

https://carnegieendowment.org/2016/06/30/china-s-perceptions-of-india-as-nuclear-weapons-power-pub-63970; Tong Zhao, "What's Driving China's Nuclear Buildup?, Commentary," *CEIP*, August 5, 2021, accessed December 19, 2021, https://carnegieendowment.org/2021/08/05/what-s-driving-china-s-nuclear-buildup-pub-85106

[482] Steff and Khoo, Hard Balancing in the Age of American Unipolarity, 222-258

[483] Tong Zhao, "What's Driving China's Nuclear Buildup? Commentary," *CEIP*, August 5, 2021, accessed December 19, 2021, https://carnegieendowment.org/2021/08/05/what-s-driving-china-s-nuclear-buildup-pub-85106

[484] Haynes, "China's Nuclear Threat Perceptions," 25-62; Yang, "China's Perceptions of India as a Nuclear Weapons Power"

weapons. The medium level of intent suggests that the use of nuclear weapons in a conflict largely depends upon how the conflict evolves. The intent is fluid, it may change as a conflict escalates or de-escalates. Lastly, the high level reflects hostile intent. It suggests a high likelihood of the use of nuclear weapons in a conflict.

The capability of the y-axis shows the level of military capability a state possesses against China. With an operational, strategic nuclear triad, a state's capabilities are high-level, making it capable of inflicting immense damage. The US and Russia fall into this category, as discussed below. In comparison, a state with two operational legs of the strategic nuclear triad is considered to have a medium-level capability and intent. For instance, India has operational land and sea-based legs of the nuclear triad but its air leg is based on fighter aircraft that provide tactical support, unlike the US, Russia, and China's air leg of the triad, which is based on both strategic bombers and tactical fighter aircraft. With one operational leg of the triad, a state would be considered to have a low-level nuclear capability. A fully operational triad would necessitate a state having a large number of nuclear weapons, meeting its triad requirement. Similarly, a low level of capability would require a low level of nuclear weapons. Nonetheless, none of the states examined in this chapter possesses low-level capability. According to neoclassical realism, these variables (intent and capability) influence China's nuclear weapons force modernization and policy and include structural external factors. The table below illustrates this, and the next section outlines how the study has arrived at the assessment in the matrix.

Table 4. Intent and Capability Matrix

Intent	**High**			US
	Medium		India	
	Low			Russia
		Low	**Medium**	**High**
	Capability			

3.3.1 **Russia: Low Intent, High Capability**[485]

Table 5 below shows the strategic nuclear inventory of Russia. It is important to note here that this table does not include the non-strategic nuclear inventory of Russia, which is based on approximately 1,870 nuclear warheads.[486]

Table 5. Chinese vs. Russian Strategic Nuclear Forces 2020[487]

Type	China		Russia	
	No. of launchers	No. of warheads	No. of launchers	No. of warheads
Bombers	20	20	68	580
Land-based ballistic missiles	280	258	310	1189
Sea-based ballistic missiles	72	72	176	816

3.3.1.1 **High Capability**

Among China's neighbors, Russia has the largest nuclear weapons stockpile. This is comprised of substantial and diversified nuclear weapons delivery platforms and a large inventory of tactical nuclear weapons. As of 2021, Russia has 6,257 nuclear warheads, and out of these, 1,760 are retired and awaiting dismantlement.[488] Therefore, Russia has 4,497 active nuclear warheads. Out of these, 1,600 are assigned to land-based and air-based strategic forces.[489] Russia also has a non-strategic stockpile of 1,912.[490] Moreover, around 2,897 warheads are kept in reserve. Russia aims to increase defense spending to 3.3 trillion roubles in 2022, taking it up to 2.8 trillion in 2023 to modernize its Soviet-era nuclear weapons inventory.[491] Apart from modernization, developing a new multi-warhead Sarmat ICBM would require an increase in the number of nuclear warheads. The "heavy" Sarmat missile, likely to be operational at some point in 2022, is a three-stage, liquid-fueled missile with a range of 18,000km and able to carry a 10-ton

[485] Hans M. Kristensen and Matt Korda, "Russian Nuclear Forces, 2020," *Bulletin Of The Atomic Scientists 2021*, Vol. 77, N0. 2, (2020), 90-108
[486] Ibid
[487] Kristensen and Korda, "Russian Nuclear Forces, 2021," *Bulletin of The Atomic Scientists*, Vol. 77, No. 2, (2021), 90-108; Hans M. Kristensen and Matt Korda, "Nuclear Notebook: Chinese Nuclear Forces, 2021," *Bulletin of the Atomic Scientists*, November 15, 2021, accessed December 15, 2021, https://thebulletin.org/premium/2021-11/nuclear-notebook-chinese-nuclear-forces-2021/
[488] Kristensen and Korda, "Russian Nuclear Forces, 2021", 90-108,
[489] Ibid
[490] Ibid
[491] Alexander Bratersky, "Russian Nuclear Weapons Stand Out in Defense Budget Request," *Defense News*, November 2, 2021, accessed December 21, 2021, https://www.defensenews.com/global/europe/2021/11/01/russian-nuclear-weapons-stand-out-in-defense-budget-request/

payload.[492] According to Russian media, it can carry up to 10 large or 16 small warheads, and a combination of warheads and countermeasures, or hypersonic boost-glide vehicles.[493] Russia is also conducting sea trials of Belgorod, SSBN, capable of carrying 6 Poseidon, a nuclear-powered and nuclear-armed (100 megaton warhead) autonomous torpedoes.[494] According to the 2020-2021 *Bulletin of the Atomic Scientists* (BAS) reports, Russia has more than 12-13 nuclear warheads for every nuclear warhead China has.[495]

Russia has also integrated nuclear weapons with its air and missile defense systems. According to the 2018 *Threat Assessment of the US Defense Intelligence Agency*, "Russia may also have [nuclear] warheads for surface-to-air and other aerospace defense missile systems."[496] Russia's S-300 missile defense systems and SA-20 interceptors are being replaced gradually by new S-400 missile systems and SA-21 interceptors.[497] According to Hans Kristensen and Matt Korda, "US government sources privately indicate that both the S-300 (SA-20) and S-400 (SA-21) are dual-capable," that is, can be used as surface-to-air missiles and for missile defense.[498] With such a level of capability and geographical proximity, Russia is potentially a security concern for China. However, China's low threat perception of Russia substantially reduces Beijing's security concerns, this aspect is discussed in the following section.

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[492] "Russia's First Sarmat ICBM to Enter Combat Duty in 2022," *TASS Russian News Agency*, December 16, 2020, accessed September 1, 2021, https://tass.com/defense/1235479?utm_source=google.com&utm_medium=organic&utm_campaign=google.com&utm_referrer=google.com; Missile Defense Project, RS-28 Sarmat, Threat, Center for Strategic and International Studies, May 17, 2017, last modified July 31, 2021, accessed December 21, 2021, https://missilethreat.csis.org/missile/rs-28-sarmat/

[493] "First Image of RS-28 Sarmat, Russia's Largest Ever ICBM, Unveiled," *Sputnik*, October 24, 2016, accessed September 29, 2021, https://sputniknews.com/military/201610241046655887-sarmat-image-declassified/; "Russia Reportedly Approves Production of New Liquid-Fueled ICBM," *Nuclear Threat Initiative*, October 22, 2016, accessed September 29, 2021, http://www.nti.org/gsn/article/russia-reportedly-approves-production-new-liquid-fueled-icbm/

[494] H I Sutton, "New Details of Russian Belgorod 'Doomsday' Submarine Revealed," *USNI*, February 25, 2021, accessed December 21, 2021, https://news.usni.org/2021/02/25/new-details-of-russian-belgorod-doomsday-submarine-revealed; Michael Peck, "Status-6 Poseidon: Russia's Nuclear Torpedo Can Trigger Tsunamis," *National Interest*, September 22, 2021, accessed December 22, 2021, https://nationalinterest.org/blog/reboot/status-6-poseidon-russia%E2%80%99s-nuclear-torpedo-can-trigger-tsunamis-194057

[495] Ibid, Hans M. Kristensen and Matt Korda, "Chinese Nuclear Forces, 2020, *Bulletin of the Atomic Scientists*, Vol. 76, No. 6, (2020) 443-457

[496] Robert Ashley, "Statement for the Record: Worldwide Threat Assessment." Prepared statement to the Senate Armed Services Committee, March 6, 2018, accessed December 15, 2019. https://www.armedservices.senate.gov/imo/media/doc/Ashley_03-06-18.pdf

[497] "Missile Defense Project, S-400 Triumph," *Missile Threat, Center for Strategic and International Studies*, May 4, 2017, last modified July 6, 2021, accessed December 12, 2022, https://missilethreat.csis.org/defsys/s-400-triumf/.

[498] Hans M. Kristensen and Matt Korda, "Russian Nuclear Forces, 2019," *Bulletin of the Atomic Scientists*, Vol. 75, No. 2, (2019), 73–84, https://www.tandfonline.com/doi/pdf/10.1080/00963402.2019.1580891?needAccess=true

3.3.1.2 Russia's Low Intent

Almost three decades after the death of Mao in 1976, and following the Sino-Soviet split, Soviet premier, Leonid Brezhnev, expressed his willingness to improve relations with China.[499] Mikhail Gorbachev's policies of glasnost (opening) and perestroika (restructuring) followed this and, starting in 1986, led to the opening up of relations once again with China.[500] Reforms under Gorbachev led to the removal of what Chinese leaders called the "three obstacles" in the bilateral relationship: removal of Soviet forces from China's border, withdrawal from Afghanistan, and Vietnam's withdrawal from Cambodia (as a result of Soviet pressure).[501] Two agreements signed in 1991 and 1994, led to the settlement of the border disputes between the states.[502] The first agreement led to the demarcation of the eastern part of the Soviet border, from Mongolia to North Korea. The second agreement led to the demarcation of the western part of the current Sino-Russo border, from Mongolia to Kazakhstan. An agreement was signed in 2004 to settle the last dispute over the Ussuri River. The agreement document of 2004 noted "the location of the border as the main fairway for all shipping rivers and the center of the river for all non-shipping rivers."[503] The agreement of 1991 led to the chain of agreements, settling all the border disputes and establishing the era of a new friendship.[504]

After the end of the Cold War and a period of perceived American assertion throughout the 1990s in regions judged important to the security interests of Russia and China, Moscow and Beijing sought to re-balance world politics together. In Moscow, on July 16, 2001, both states signed the bilateral *Treaty of Good Neighbourliness and Friendly Cooperation* (also known as the 'big treaty').[505] After signing the treaty, China and Russia in 2004 settled their last border dispute on the Ussuri River, the last irritant in the relationship.[506] In addition, the treaty paved the way for increased military-to-military and

[499] Gilbert Rozman, "Moscow's China-Watchers in the Post-Mao Era: The Response to a Changing China," *The China Quarterly*, No. 94 (June, 1983), 215-241
[500] William deB. Mills, "Gorbachev and the Future of Sino-Soviet Relations" *Political Science Quarterly*, Vol. 101, No. 4 (1986), 535-557
[501] Michael Bowker, *Russian Foreign Policy and the End of the Cold War* (Aldershot: Dartmouth, 1997), 115
[502] Alexander Lukin, "Territorial Issues in Asia: Drivers, Instruments, Ways Forward," *German Institute for International Security Affairs and Konard Adenauer Stiftung*, July 2013, accessed December 22, 2021, https://www.swp-berlin.org/publications/products/projekt_papiere/BCAS2013_Alexander_Lukin.pdf
[503] Lukin, "Territorial Issues in Asia," 6-7
[504] Ibid
[505] Alexander Korolev, "On the Verge of an Alliance: Contemporary China-Russia Military Cooperation, *Asian Security*, Vol. 15, No. 3, (2019), 237
[506] Liu Fenghua, "The Pattern of China-Russia Strategic Coordination: Formation, Features, and Prospects," *International Studies (China Institute of International Studies)*, March 2016, 2. Translation; Li Chenghong,

government-to-government relations as, from 2005, they increased the pace and diversified the spectrum of engagement in three main areas: joint military exercises, technical-military cooperation, and high-level military-to-military contacts.[507] From 2003 to early 2017, China and Russia conducted approximately 25 joint military exercises showing complex joint operations and coordination.[508] In 2018, China, with 3500 troops, participated in Russia's largest military exercise, Vostok-2018, aimed at large-scale conflict, which involved 300,000 Russian soldiers.[509] In 2019, China sent strategic bombers, tanks, and 1,600 troops to Russia for a large-scale military exercise, also involving India, Pakistan, Kyrgyzstan, Kazakhstan, Tajikistan, and Uzbekistan.[510] In the same year, Russia and China held their first joint strategic aviation patrol exercises.[511] In 2020, PLA troops took part in Russia's Kavkaz 2020 military exercises, and in the same year, both states again had joint strategic aviation patrol exercises.[512] In August 2021, China and Russia conducted a large-scale military exercise in north-central China, and in October 2021, a joint naval exercise was carried out in the Russian Far East seas. In November 2021, the states jointly issued a road map for 2021-2025 joint military cooperation, which may include joint air and naval patrols. Because of the emerging and

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"China-Russia Military Technology Cooperation: Status, Issues, and Countermeasures," *Russian Studies*, February 2009, 91–93. Translation; Xinhua, "FM: China Boundary Agreement with Russia Sets Example," October 14, 2008. http://news.xinhuanet.com/english/2008-10/14/content_10246727.htm

[507] Ibid; Paul Schwartz, "Russia-China Defense Cooperation: New Developments," *Asian Forum*, February 8, 2017, accessed June 11, 2020, http://www.theasanforum.org/russia-china-defense-cooperation-new-developments/; Lyle J. Goldstein, "Watch Out: China and Russia are Working Together at Sea," *National Interest*, April 13, 2016, accessed June 11, 2020, http://nationalinterest.org/blog/the-buzz/watch-out-china-russia-areworking-together-sea-15767; Richard Weitz, "Parsing Chinese-Russian Military Exercises," *Strategic Studies Institute*, April 15, 2015, accessed June 11, 2020, http://www.strategicstudiesinstitute.army.mil/pdffiles/PUB1266.pdf; Russia Begins its Largest Ever Military Exercise with 300,000 Soldiers, *The Guardian*, September 11, 2018, accessed June 11, 2020, https://www.theguardian.com/world/2018/sep/11/russia-largest-ever-military-exercise-300000-soldiers-china

[508] Schwartz, "Russia-China Defense Cooperation: New Developments"; Goldstein, "Watch Out: China and Russia are Working Together at Sea"; Weitz, "Parsing Chinese-Russian Military Exercises"

[509] "Russia Begins its Largest Ever Military Exercise with 300,000 Soldiers," *The Guardian*, September 11, 2018, accessed June 11, 2020, https://www.theguardian.com/world/2018/sep/11/russia-largest-ever-military-exercise-300000-soldiers-china

[510] Franz-Stefan Gady, "China Sends Strategic Bombers, Tanks and 1,600 Troops to Russia for Large Military Drill," *The Diplomat*, September 17, 2019, accessed July 25, 2021, https://thediplomat.com/2019/09/china-sends-strategic-bombers-tanks-and-1600-troops-to-russia-for-large-military-drill/

[511] Richard Weitz, "Assessing Chinese-Russian Military Exercises Past Progress and Future Trends," *Center for Strategic and International Studies*, July 2021, accessed July 27, 2021, https://csis-website-prod.s3.amazonaws.com/s3fs-public/publication/210709_Weitz_Chinese-Russian_Exercises.pdf?sVj9xEhVUrzel_Mbf5pOdJqAQwUvn2zq

[512] Catherine Wong, "Chinese Troops to Take Part in Russia's Kavkaz 2020 Military Exercises," *SCMP*, September 10, 2020, accessed July 28, 2021, https://www.scmp.com/news/china/diplomacy/article/3101059/chinese-troops-take-part-russias-kavkaz-2020-military?module=perpetual_scroll&pgtype=article&campaign=3101059, Ibid, 9

deepening relationship, under military-technical cooperation, Russia confirmed the sale of the S-400 surface-to-air missile system (SAM) to China in 2015.[513] This level of cooperation is notable because S-400 is the latest system in the Russian BMD inventory and could have significant consequences for Russia if Russia-China relations deteriorate and China deploys the system to intercept incoming strikes from Russia.

With delivery in 2018, China became the first foreign buyer of the S-400, enhancing its air defense capabilities.[514] China received two regiments of the S-400, the first in May 2018 and the second in February 2020.[515] In the Russian military, a regiment consists of two battalions, and each includes two batteries. A typical S-400 battery consists of "four transporter erector launchers (TELs) with four large launch tubes or 16 smaller tubes (or a combination of the two) per TEL, in addition to long-range surveillance radar target acquisition and engagement (fire control) radar systems and a command post (vehicle)."[516] The Russians have already tested and deployed the S-400. China's PLA Rocket Force also tested the S-400 in November 2018, successfully hitting a "simulated ballistic target almost 250km (155 miles) away and moving at the supersonic speed of 3km (1.9 miles) per second."[517] China has deployed two batteries of the S-400 of the first regiment in the proximity of Beijing.[518] It is not clear in which theatre China has deployed the other S-400. If deployed in the Eastern Theatre Command, it could help China attain air dominance over Taiwan and pose a challenge to the US in a Cross-Strait Conflict.[519] Additionally, the S-400 system could help China to implement the Air Defense Identification Zone (ADIZ) in the East China Sea (ECS) and South China Sea (SCS).

Additionally, under the Shanghai Cooperation Organization (SCO), bilateral cooperation has deepened and been extended across the Eurasian region. With Tajikistan, Kazakhstan,

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[513] Ethan Meick, "China-Russia Military-to-Military Relations: Moving Toward a Higher Level of Cooperation," March 20, 2017, accessed December 16, 2019, https://www.uscc.gov/sites/default/files/Research/China-Russia%20Mil-Mil%20Relations%20Moving%20Toward%20Higher%20Level%20of%20Cooperation.pdf

[514] Ibid

[515] Franz-Stefan Gady, "Russia Completes Delivery of Second S-400 Regiment to China," *The Diplomat*, February 3, 2020, accessed March 23, 2020, https://thediplomat.com/2020/02/russia-completes-delivery-of-second-s-400-regiment-to-china/

[516] Franz-Stefan Gady, "Russia Kicks off Delivery of China's Second S-400 Air Defense Regiment," *The Diplomat*, July 25, 2019, accessed January 16, 2020, https://thediplomat.com/2019/07/russia-kicks-off-delivery-of-chinas-second-s-400-air-defense-regiment/

[517] Minnie Chan, "Chinese Missile Force puts New Russian S-400 Air Defense System to the Test, "December 27, 2018, accessed January 17, 2020, https://www.scmp.com/news/china/military/article/2179564/chinese-missile-force-puts-new-russian-s-400-air-defense-system

[518] Gady, "Russia Completes Delivery of Second S-400"

[519] Ethan Meick, "China-Russia Military-to-Military Relations" 3

Kyrgyzstan, and Uzbekistan, Russia and China conducted seventeen military exercises outside China from 2002 to November 2020.[520] Also, Russia has been a major arms supplier to China since 1992, and China's modern weapons inventory is mostly based on reverse engineering carried out on Russian weapons.[521] In October 2020, President Putin at a video conference stated, "without any doubt, our cooperation with China is bolstering the defense capability of China's army," and signaled that "we don't need [military union with China] it, but, theoretically, it's quite possible to imagine it."[522] Recently, just before the Russian invasion of Ukraine, on February 4, 2022, Putin and Xi met at the inauguration ceremony of the Winter Olympics, in Beijing. The joint statement following their meeting notes,

> the new inter-State relations between Russia and China are superior to political and military alliances of the Cold War era…[The] friendship between the two States has no limits, there are no 'forbidden' areas of cooperation, strengthening of bilateral strategic cooperation is neither aimed against third countries nor affected by the changing international environment and circumstantial changes in third countries.[523]

The Russia-China friendship has a political dimension as well. Both states have maintained broadly similar policies during international crises involving Syria, North Korea, and Iran, and on issues such as arms control and strategic stability and the US missile defense program.[524] Apart from political relations, China and Russia have also deepened economic ties. For Russia's economic growth, China's economic rise is an opportunity because the US and EU placed sanctions on Russia after Moscow annexed Crimea in 2014.[525] Russian President Vladimir Putin, in one article, wrote that China's

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[520] "U.S.-China Economic and Security Review Commission," *Issue Brief*, November 12, 2020, https://www.uscc.gov/sites/default/files/2020-11/Shanghai_Cooperation_Organization-Testbed_for_Chinese_Power_Projection.pdf; Marcel de Haas, "War Games of the Shanghai Cooperation Organization and the Collective Security Treaty Organization: Drills on the Move!" *The Journal of Slavic Military Studies*, Vol. 29, No. 3, (2016) 378-406

[521] "TIV of Arms Exports from Russia, 1992-2020," *SIPRI Arms Transfers Database*, Generated: 21 December 2021, https://armstrade.sipri.org/armstrade/html/export_values.php

[522] Vladimir Isachenkov, "Putin: Russia-China Military Alliance Can't Be Ruled Out," *AP News*, October 23, 2020, accessed December 21, 2021, https://apnews.com/article/beijing-moscow-foreign-policy-russia-vladimir-putin-1d4b112d2fe8cb66192c5225f4d614c4

[523] Rajeswari Pillai Rajagopalan, "Putin and Xi Frame a New China-Russia Partnership," *The Diplomat*, February 15, 2022, accessed February 19, 2022, https://thediplomat.com/2022/02/putin-and-xi-frame-a-new-china-russia-partnership/

[524] Mu REN, "Interpreting China's (Non-)Intervention Policy to The Syrian Crisis: A Neoclassical Realist Analysis," June 2014, accessed January 18, 2020, http://www.ritsumei.ac.jp/ir/isaru/assets/file/journal/27-1_12_Ren.pdf; Joseph Bosco, "China, Russia, North Korea, Iran: Confronting the New Axis of Aggression and Evil," January 6, 2020, accessed January 17, 2020, https://thehill.com/opinion/international/476899-china-russia-north-korea-iran-confronting-the-new-axis-of-aggression-and-evil

[525] "U.S. Sanctions on Russia: An Overview," In *Focus, Congressional Research Service (CRS)*, June 7, 2021, accessed July 27, 2021, https://fas.org/sgp/crs/row/IF10779.pdf

rise "carries colossal potential for business cooperation" and "a chance to catch the Chinese wind in the sails of our economy."[526] Recently, in December 2019, China and Russia inaugurated a $55 billion gas pipeline project, dubbed the Power of Siberia.[527] The capacity of this pipeline is one of the largest in the world as Russia will provide China with thirty-eight billion cubic meters of gas annually for thirty years.[528]

China-Russia bilateral trade is growing. It was $40.20 billion in the first quarter of 2021, which is 19.8 percent higher than the first quarter of 2020.[529] In FY 2020, the bilateral trade between the states exceeded $100 billion.[530] It is expected that bilateral trade will reach $120 billion in FY 2021.[531]

Despite the cooperation at the economic and military levels, differences and competition between China and Russia does exist. China's share in the global distribution of power is increasing, and it maintains an upper hand in its relationship with Russia. Over time, the comparative advantage is likely to generate greater levels of power asymmetry in favor of China.[532] Therefore, China's Russia policy will set the trajectory of their mutual relations and could make Russia increasingly uncomfortable as the power asymmetry between them deepens. Additionally, in the Central Asia Republics (CARs) and the Russian Far East – considered by Russia as its natural sphere of influence – China's influence is increasing, and the future prospects for the Russia-led Eurasian Economic Union (EEU) relative to China's Belt and Road Initiative (BRI) are unfavorable.[533] In 2015 there were initiatives to pair the EEU and BRI. In May 2018, an agreement was signed between EEU countries and China.[534] China has provided more than $98 billion

[526] Vladimir Putin, "Russia and the Changing World," *RT*, February 27, 2012, accessed January 18, 2020, https://www.rt.com/russia/official-word/putin-russia-changing-world-263/
[527] Simone McCarthy, "China and Russia Forge Deeper Ties Thanks to Their Common Enemy: the United States, December 3, 2019, accessed January 17, 2020, https://www.scmp.com/news/china/diplomacy/article/3040437/china-and-russia-forge-deeper-ties-thanks-their-common-enemy
[528] Ibid
[529] "China-Russia Bilateral Trade Up 20 Percent in January-April 2021," *China Briefing*, May 7, 2021, accessed July 27, 2021, https://www.china-briefing.com/news/china-russia-bilateral-trade-up-20-percent-in-january-april-2021/
[530] Ibid
[531] Ibid
[532] Paul Stronski and Nicole Ng, "Cooperation and Competition: Russia and China in Central Asia, the Russian Far East, and the Arctic," February 28, 2018, accessed January 18, 2020, https://carnegieendowment.org/2018/02/28/cooperation-and-competition-russia-and-china-in-central-asia-russian-far-east-and-arctic-pub-75673
[533] Ibid
[534] Oleg Remyga, "Linking the Eurasian Economic Union and China's Belt and Road," *Reconnectng Asia*, November 9, 2020, accessed December 22, 2021, https://reconasia.csis.org/linking-eurasian-economic-union-and-chinas-belt-and-road/

for 168 infrastructure projects to Armenia, Belarus, Kazakhstan, Kyrgyzstan, and Russia.[535] However, Chinese investment policies are not equitable, making smaller states dependent on China.[536] For instance, in the oil and gas sectors in Kazakistan, 98 percent of investments are from China's national companies and 20 percent of total oil extractions are linked to China's state-owned National Petroleum Corporation.[537] Yet, while China might have more trade and investment with EEU countries than Russia, Moscow dominates in the security sphere.[538] It is plausible that Russia and China will, therefore, find it difficult to manage their interests in former Soviet nations – China, for example, might seek to eventually replace Russia as the major security partner for these nations, a step Russia would surely oppose. On the other hand, it is plausible that Moscow and Beijing will feel there are more incentives to sustain their 'no limits' partnership necessitating them to carefully manage their respective security and economic ties with these countries in a manner than does not antagonize the other party.

China-Russia relations are growing at a time when US-Russia relations have soured immensely, and especially since Russia's annexation of Crimea in 2014, and now over Russia's invasion of Ukraine.[539] Russia-EU relations have hit a post-Cold War low because of the Russian invasion of Ukraine (and due to other provocative steps Moscow has taken in recent years).[540]According to UN estimates, since the invasion started on February 24, 2022, 1,611 civilians have died (as of April 6, 2022).[541] The invasion has led the US-led EU to impose severe economic, financial, and diplomatic sanctions on Russia.[542] It appears Russia does not have any other option at the moment than to

[535] Ibid
[536] Ibid; Gaziza Shakhanova and Jeremy Garlick, "The Belt and Road Initiative and the Eurasian Economic Union: Exploring the 'Greater Eurasian Partnership'," *Journal of Current Chinese Affairs*, Vol. 49, No. 1 (2020) 33-57
[537] Ibid
[538] Andrei Kazantsev, Svetlana Medvedeva and Ivan Safranchuk, "Between Russia and China: Central Asia in Greater Eurasia," *Journal of Eurasian Studies*, Vol. 12, No. 1, (2021) 57-71; Blog Post, "Russia's Recent Military Buildup in Central Asia," *CSIS*, September 25, 2020, accessed December 20, 2021, https://www.csis.org/blogs/post-soviet-post/russias-recent-military-buildup-central-asia
[539] News; "What are the 10 Key Areas of Tension Between the US and Russia?" *Aljazeera*, December 6, 2021, accessed December 22, 2021, https://www.aljazeera.com/news/2021/12/6/what-are-the-10-key-areas-of-tension-between-the-us-and-russia
[540] This includes Russian meddling in recent elections of EU states, orchestration of cyber-attacks against the Baltic states, and support for Belarus as it wielded immigrants as a political weapon against the EU.
[541] "Number of Civilian Casualties in Ukraine during Russia's Invasion Verified by OHCHR as of April 6, 2022," *Statista*, April 7, 2022, accessed April 11, 2022, https://www.statista.com/statistics/1293492/ukraine-war-casualties/
[542] "United States, G7 and EU Impose Severe and Immediate Costs on Russia," *The White House*, Briefing Room Fact Sheet, April 6, 2022, accessed April 11, 2022, https://www.whitehouse.gov/briefing-room/statements-releases/2022/04/06/fact-sheet-united-states-g7-and-eu-impose-severe-and-immediate-

strengthen its relations with China. The level of cooperation between Russia and China and their joint opposition to US hegemony may very well provide China with assurance and confidence that Russia, despite the formidable size of its nuclear weapons inventory, does not pose an imminent threat.[543] If anything, it may be that the size and breadth of Russia's nuclear weapons inventory mean the US must constantly focus on Russia in this area, thus deflecting US attention and providing China with room to expand and enhance its own nuclear forces over time (recent developments in China' nuclear program are discussed in Chapter Five).

According to some realists, however, what should matter most is capability; intentions can change at any time. A friend today may be an enemy tomorrow, and if they have significant capabilities, the new enemy will have capabilities to use against its former friend. Close to China's border, Russia's Eastern Military District has four missile brigades (3rd, 20th, 103rd, and 107th) equipped with the road-mobile nuclear-capable 9K720 Iskander-M missile system with a range of 400-500km.[544] One of these is close to the border of Magnolia, and one is close to Inner Magnolia. The other two are deployed in the region, close to North Korea and China borders.[545] From their current position, these brigades cannot engage strategic targets in South Korea and Japan, such as the Terminal High Altitude Area Defense (THAAD) system in South Korea and US bases in Japan.[546] In order to make two brigades close to the North Korean border viable against any target or situation involving Japan and South Korea, Russia needs to deploy them close to its eastern border. Therefore, it may be assumed that these nuclear-capable missiles, with precision and a limited range, serve the strategic objective of posing a risk to China.[547] Likewise, China deployed the DF-41 to the Heilongjiang province in 2017, close to the Russian border. The Kremlin's reaction was brief and precise, "we don't see

costs-on-russia/; Mira Milosevich, "Russia's Westpolitik and the European Union," *CSIS*, July 8, 2021, accessed December 22, 2021, https://www.csis.org/analysis/russias-westpolitik-and-european-union

[543] Petr Topychkanov, "Russia's Nuclear Doctrine Moves the Focus from Non-Western Threats," *SIPRI*, October 1, 2020, accessed March 29, 2020, https://www.sipri.org/commentary/blog/2020/russias-nuclear-doctrine-moves-focus-non-western-threats

[544] Hans M. Kristensen and Matt Korda, "Russian Nuclear Weapons, 2021," *Bulletin of the Atomic Scientists*, Vol. 77, No. 2 (2021), 103; Roger McDermott, "Russia's Military Precision Strike Capability Prioritizes Iskander-M," *Eurasia Daily Monitor* Vol. 14, Issue 82 (2017), https://jamestown.org/program/russias-military-precision-strike-capability-prioritizes-iskander-m/

[545] Kristensen and Korda, "Russian Nuclear Weapons, 2021," 103

[546] Guy Plopsky, "Why Is Russia Aiming Missiles at China?" July 12, 2017, accessed March 29, 2021, https://thediplomat.com/2017/07/why-is-russia-aiming-missiles-at-china/

[547] Alexei Arbatov and Vladimir Dvorkin, "The Great Strategic Triangle," *The Carnegie Papers*, Carnegie Moscow Center April 2013, accessed March 29, 2021, https://carnegieendowment.org/files/strategic_triangle.pdf

the military disposition of China as a threat to our country."[548] The statement reflects a higher level of cooperation and trust among both states, with both lacking perceived threats from the other. Additionally, Russia carried out large-scale military exercises – the Vostok-2018 (East-2018) and Tsentr-2019 (Centre-2019) – involving nuclear-capable Iskander-Ms close to China's border. To avoid suspicions about its intentions, Russia invited China to join as a participant in these military exercises. [549] In other words, capabilities matter, but intentions can be conveyed via signals and collaboration, and Russia has sought to do this towards China, in turn assuaging China's concerns.

In short, Russia is a promising partner in countering external challenges. In September 2020, amidst growing tensions in the Indo-Pacific region, Russian Defense Minister, Sergei Shoigu pledged additional troops and naval enforcements in the eastern strategic theatre.[550] Responding to these developments, Dmitry Peskov, Kremlin spokesperson, stated that Moscow's concerns are based on the designs of states outside its region and "all of these, of course, do not contribute to stability in this region."[551] In a US-China conflict, these forces could, in theory, come to China's aid. China's low-threat assessment of Russia is further influenced by the fact that Russia's power is declining relative to China's rising power. In 2020, China had a Gross Domestic Product (GDP) of $14.72 trillion and a defense budget of $252 billion, whereas Russia had a GDP of $1.47 trillion and a defense budget of $61.7 billion.[552] Moreover, with a rising GDP, China's share in the global distribution of power is increasing.[553]

Though Russia has a massive nuclear inventory and deployments on the border of China and vice-versa, given their common interests, cooperation on a host of military and

[548] "China Moves Nuclear Missiles to Russian Border (News)," *The Moscow Times*, January 24, 2017, accessed December 22, 2021, https://www.themoscowtimes.com/2017/01/24/china-moves-nuclear-missiles-to-russian-border-a56903
[549] Topychkanov, "Russia's Nuclear Doctrine Moves," *SIPRI*
[550] "Amid Tensions, Russia Is Deploying Thousands Of Soldiers Near China Border," *The EurAsian Times*, September 21, 2020, accessed March 29, 2021, https://eurasiantimes.com/after-india-why-is-moscow-deploying-thousands-of-soldiers-near-russia-china-border/
[551] Ibid
[552] "World Military Spending Rises to Almost $2 Trillion in 2020," *SIPRI*, April 26, 2021, accessed July 26, 2021, https://www.sipri.org/media/press-release/2021/world-military-spending-rises-almost-2-trillion-2020; "Gross Domestic Product (GDP) at Current Prices in China from 1985 to 2020 with Forecasts until 2026, *Statista*, April 7, 2021, accessed July 27, 2021, https://www.statista.com/statistics/263770/gross-domestic-product-gdp-of-china/; Russia: Gross Domestic Product (GDP) in Current Prices from 1996 to 2026," *Statista*, April 7, 2021, accessed July 27, 2021, https://www.statista.com/statistics/263772/gross-domestic-product-gdp-in-russia/
[553] John Ikenberry, "The Rise of China and the Future of the West," *Foreign Policy*, January/February 2008, accessed January 18, 2020, https://www.foreignaffairs.com/articles/asia/2008-01-01/rise-china-and-future-west

security interests, and political alignments at the global level, China does not view these deployments as a major threat. Apart from Russia's immense destructive material capability and their geographical proximity, one structural reason that reduces the threat perception of China vis-à-vis Russia is that both states share threat from the same source, the US, which has a greater level of relative power than Russia and China combined. This is discussed later in the chapter.

3.3.2 India: Medium Intent with Medium Capability

India has 150 nuclear weapons. Approximately 70 of the total warheads are deployed across different ranges of ballistic missiles, 48 across the Indian Air Force, and 16 warheads are kept for sea-based ballistic missiles.[554] Moreover, according to a 2020 FAS report, India has at least 600 kilograms of weapon-grade plutonium sufficient to make an additional 150-200 nuclear weapons.[555] Table 6, below, shows India's medium-level nuclear weapons capabilities relative to China's nuclear weapons capabilities in land, air, and sea-based domains.

Table 6. Chinese vs. Indian Strategic Nuclear Forces 2020[556]

Type	China		India	
	No. of launchers	No. of warheads	No. of launchers	No. of warheads
Bombers	20	20	0	0
Land-based ballistic missiles	280	258	70	70
Sea-based ballistic missiles	72	72	16	16

According to an Indian scholar's assessment, from 2018, India had an operational nuclear triad.[557] India has a wide range of land-based, nuclear-capable ballistic missiles. The

[554] Hans M. Kristensen and Matt Korda, "Indian Nuclear Forces, 2020," *Bulletin of the Atomic Scientists*, Vol. 76, No. 4, 217-225, accessed December 24, 2021, https://www.tandfonline.com/doi/pdf/10.1080/00963402.2018.1533162?needAccess=true

[555] Ibid., "International Panel on Fissile Materials. 2015. Global Fissile Material Report 2013:" *Nuclear Weapon and Fissile Material Stockpiles and Production*. http://fissilematerials.org/library/gfmr15.pdf

[556] Hans M. Kristensen and Matt Korda, :Indian Nuclear Forces, 2020"; Hans M. Kristensen and Matt Korda, "Chinese Nuclear Forces, 2021," *Bulletin of the Atomic Scientists*, November 15, 2021, accessed December 24, 2021, https://thebulletin.org/premium/2021-11/nuclear-notebook-chinese-nuclear-forces-2021/

[557] "INS Arihant Completes India's Nuclear Triad, PM Modi Felicitates Crew," *The Economic Times*, November 6, 2018, accessed July 28, 2021, https://economictimes.indiatimes.com/news/defence/ins-arihant-completes-indias-nuclear-triad-pm-modi-felicitates-crew/articleshow/66509959.cms; Yogesh Joshi, "Angles and Dangles: Arihant and the Dilemma of India's Undersea Nuclear Weapons," *War On The Rocks*, January 14, 2019, accessed July 28, 2021, https://warontherocks.com/2019/01/angles-and-

Prithvi-II with 250km and Agni-I with 700km are short-range missiles, Agni-II with a range of more than 2,000km is medium range, and Agni-III with a 3,200km range is an intermediate-range ballistic missile.[558] Agni-IV, with a range of 3,500km, is also an intermediate-range ballistic missile, and was inducted into service in 2018.[559] The Agni-V with a range of more than 5,200km is categorized as a near-ICBM and is scheduled to be deployed in 2025.[560] Though there are no official plans, there are speculations that India might add MIRVs to Agni-V in the future to meet similar capability-based challenges from China, but that would reduce its range.[561]

The Indian Air Force has 16 Vajra (Mirage 2000H) and 32 Shamsher (Jaguar IS/IB) aircraft deployed at three bases. These are assigned tactical nuclear strike roles.[562] The sea trials of India's first indigenously built nuclear-powered submarine SSBN, the INS Arihant, in the Bay of Bengal, began in 2016.[563] The INS Arihant spent 2017 and half of 2018 undertaking maintenance after water rushed into its propulsion system due to human error as the hatch was left open while it was in the harbor.[564] Another SSBN, the INS Arighat, deployed in November 2017, is likely to become operational in 2022.[565] According to *Jane Defense Weekly*, the "Arighat will be succeeded in the dry dock by two similar SSBNs that have been temporarily designated S4 and S4."[566] In 2018, the INS Arihant successfully carried out "two submerged unit trials of nuclear-capable K-15 missiles."[567] The INS Arihant is a significant milestone in India's overall military growth

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dangles-arihant-and-the-dilemma-of-indias-undersea-nuclear-weapons/; Ajey Lele Parveen Bhardwaj, "India's Nuclear Triad: A Net Assessment," *Institute for Defense Studies and Analyses*, Occasional Paper No. 31, accessed December 31, 2019, https://idsa.in/system/files/OP_IndiasNuclearTriad.pdf

[558] Hans M. Kristensen and Matt Korda, "Indian Nuclear Forces, 2020"

[559] Jonathan McLaughlin, "India's Expanding Missile Force," *Wisconsin Project on Nuclear Arms Control*, October 20, 2020, accessed July 28, 2021, https://www.wisconsinproject.org/indias-expanding-missile-force/; Ministry of Defense. 2014. *Annual Report 2013–14*: 86. http://mod.nic.in/writereaddata/AnnualReport2013-14-ENG.pdf

[560] "India Plans Deployment of Nuclear-Capable Agni-V This Year," *Indian Express*, January 4, 2021, accessed July 28, 2021, https://www.newindianexpress.com/nation/2021/jan/04/india-plans-deployment-of-nuclear-capable-agni-v-this-year-2245188.html

[561] Hans M. Kristensen and Matt Korda, "Indian Nuclear Forces, 2020"

[562] Ibid

[563] Hans M. Kristensen and Matt Korda, "Indian Nuclear Forces, 2018"

[564] Dinakar Peri and Josy Joseph, "INS Arihant Left Crippled After 'Accident' 10 Months Ago." *The Hindu*, January 8, 2018, https:// www.thehindu.com/news/national/ins-arihant-leftcrippled-after-accident-10-months-ago/article22392049.ece.

[565] Hans M. Kristensen and Matt Korda, "Indian Nuclear Forces, 2020"

[566] Rahul Bedi, "India Quietly Launches Second SSBN." *IHS Jane's Defense Weekly*, December 11, 2017, accessed January 22, 2020, https://web.archive.org/web/20171212031838/http://www.janes.com/article/76315/india-quietly-launches-second-ssbn

[567] Hans M. Kristensen and Matt Korda, "Indian Nuclear Forces, 2020"

because sea-based nuclear weapons increase the credibility of second or retaliatory strike capabilities, and therefore, strengthen nuclear deterrence.

For China, the Agni series of ballistic missiles is a primary concern as half of India's nuclear arsenals are made up of land-based ballistic missiles.[568] The Agni-IV, when deployed, would be able to strike all of Pakistan (China's strategic partner) and, if positioned strategically in north eastern India, would engage targets in western and south-western China.[569] However, with the Agni-V, when deployed, India would be able to engage any target in China.[570]

3.3.2.1 Indian Medium Intent

Shortly after the partition of the sub-continent in August 1947, the father of the Indian nuclear weapons program, Homi Bhabha, persuaded Jawaharlal Nehru to invest in nuclear energy, which led to the establishment of the Indian Atomic Energy Commission in August 1948.[571] Initially, the Indian nuclear program was concerned with the peaceful purposes of nuclear energy. PM Nehru went a step ahead of Mao and branded nuclear weapons "a symbol of evil:"[572] however, he later stated, "of course, if we are compelled as a nation to use it for other purposes, possibly no pious sentiments of any of us will stop the nation from using it that way."[573]

In 1955, Canada provided India with a nuclear reactor, CIRUS (the Canada India Reactor Utility Services).[574] The US provided heavy water under the auspices of the 'Atoms for Peace' Program – an initiative to share nuclear technology for peaceful purposes.[575] In July 1960, the CIRUS reactor went critical and most of the plutonium used in India's first nuclear test was obtained from this reactor.[576] After China's first nuclear weapons test in October 1964, Bhabha urged then-PM, Lal Bahadur Shastri, to sanction the nuclear

[568] Ibid
[569] Ibid
[570] "India Country Profile: Missiles," Nuclear Threat Initiative, Last Updated: November 2019, accessed January 22, 2020, https://www.nti.org/learn/countries/india/delivery-systems/
[571] "Indian Nuclear Program," *Atomic Heritage Foundation*, August 23, 2018, accessed July 27, 2021, https://www.atomicheritage.org/history/indian-nuclear-program; Government of India Atomic Energy Commission, Government of India: Department of Atomic Energy, April 20, 2021, accessed July 27, 2021, https://dae.gov.in/node/394
[572] G.G. Mirchandani, *India's Nuclear Dilemma* (New Delhi: Popular Book Service, 1968), 3
[573] Lok Sabha Debates, Parliament of India, May 10, 1966, Column 15712; also see Vandana Bhatia, *Change in the U.S. Nuclear Nonproliferation Policy toward India (1998-2005): Accommodating the Anomaly*, Doctor of Philosophy Thesis, University of Alberta, 2012, 66-67
[574] Peter R. Lavoy, "The Enduring Effects of Atoms for Peace," *Arms Control Association*, accessed July 26, 2021, https://www.armscontrol.org/act/2003_12/Lavoy
[575] Ibid
[576] "Indian Nuclear Program," *Atomic Heritage Foundation*

weapons program, however, he declined. According to George Perkovich, Bhabha, on his trip to the US, on February 22, 1965, he tried to convince then-Under Secretary of State, George Ball, to give India nuclear weapons blueprints.[577] Ball later reported, "Dr. Bhabha explained that if India went all out, it could produce a device in 18 months; with a U.S. blueprint, it could do the job in six months"[578] The sudden death of PM Shastri paved the way for Indira Gandhi, who pursued a nuclear weapons program. The nuclear technology received for 'peaceful purposes' was directed towards a military program.[579]

India carried out its first test of a plutonium-based device in 1974, almost a decade after China's first nuclear weapons test. India called this a "Peaceful Nuclear Explosion (PNE)."[580] Raja Ramanna, who was then head of Bhabha Atomic Research Centre (BARC) and principal designer of India's first nuclear device, later acknowledged that "the Pokhran test was a bomb," which was "not all that peaceful."[581] The 1974 nuclear weapons test made India a de-facto nuclear weapons state. Later in 1998, India carried out further nuclear weapons tests and became a de-jure nuclear weapons state.[582]

However, the gap between the first so-called peaceful nuclear explosion of 1974, which was partially successful according to the *Federation of American Scientists* (FAS), and the acquisition of credible nuclear weapons capability, signaled by the series of nuclear weapons tests in 1998, took more than two decades. Such a large gap of 24 years raises questions about the accuracy of the long-held Western and Indian explanation for the latter's nuclear weapons development as being a security-driven program against China. Two explanations have been put forward for this discrepancy. The first is related to domestic nuclear politics and the second to technical resource and material constraints. The first explanation said that the anti-nuclear weapons lobby led by then-PM Nehru led to years of delay in acquiring a credible bomb. C Raja Mohan convincingly questioned this explanation, writing,

> Nehru and Bhabha were clear in their mind that India should not give up the option to make nuclear weapons in the future. For this reason they refused to support any control mechanism – whether it was the Baruch Plan of the U.S. in 1945 or the international safeguards system – that

[577] George Perkovich, "Bhabha's Quest for the Bomb," *BAS*, Vol. 56, No. 3 (2000), 59-61
[578] Ibid., 60
[579] Christine Fair, "Learning to Think the Unthinkable: Lessons from India's Nuclear Tests," *India Review*, Vol. 4, No. 1, January, 2005, 23-58
[580] Ibid
[581] Thomas C. Reed and Danny B. Stillman, *The Nuclear Express: A Political History of the Bomb and Its Proliferation* (Minneapolis, MN: Zenith Press, 2009), 237
[582] Ibid

> sought to limit India's nuclear potential and future decision making on the bomb.[583]

The alternative explanation holds that it was technical resource constraints that caused the delay. Some scholars in the Indian literature note that in the 1960s, Indian nuclear scientists were short of the technical expertise required to run the Phoenix reprocessing facility.[584] Moreover, they also lacked the fissile material required for further testing. Under such circumstances, it is believed that the father of India's nuclear program, Homi Bhabha, requested US help to build a nuclear explosive device.[585] To explain the gap between the 1974 PNE and 1998 nuclear weapons tests, some Chinese literature suggests, "India needed more time to develop its nuclear explosive device, as well as more time to digest the 1974 test data."[586]

China's response to India's 1998 nuclear test was more trivial than to the 1974 test; when India tested nuclear weapons in 1998, China merely expressed regret.[587] In Beijing, Indian nuclearization was officially assessed in relation to its possible implications on global efforts toward nuclear arms control, non-proliferation, and disarmament, rather than what it meant for China's deterrent forces. The Chinese government claimed India's nuclear weapons test demonstrated an "outrageous contempt for the international community" and it was "a blow to international efforts to prevent nuclear weapons proliferation."[588] However, it did not say India's new capabilities were a direct threat to China itself.[589]

Though India has a large and growing nuclear inventory capable of targeting China (comprised of approximately 10 Agni-II launchers with a range of 2,000km, and fewer than 10 Agni-III with a range of 3,200-3,500km are deployed in Northern India[590]),

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[583] C. Raja Mohan, "India and Nuclear Weapons," *Internationale Politik und Gesellschaft (International Politics and Society)* Issue 4, accessed December 12, 2019, https://www.fes.de/ipg/ipg4_98/artmohan.html
[584] Rajesh Rajagopalan and Atul Mishra, *Nuclear South Asia: Keywords and Concepts* (New Delhi: Routledge, 2014), 12
[585] Ibid
[586] Xia Liping, "Lun Yindu De He Zhengce Yu He Zhanlue" [India's nuclear policy and strategy], *South Asia Studies*, No. 2, 15 quoted in Xiaoping Yang, *China's Perceptions of India as a Nuclear Weapons Power*, June 30, 2016, accessed December 29, 2019, https://carnegieendowment.org/2016/06/30/china-s-perceptions-of-india-as-nuclear-weapons-power-pub-63970
[587] Susan Turner Haynes, "China's Nuclear Proliferation"
[588] "Chinese Government's Official Statement of Protest over Indian Test," read by Zhu Bangza, *Voice of America*, 14 May 1998, https://www.fas.org/news/india/1998/05/980514 -india2.htm.
[589] Srikanth Kondapalli, "China's Response to Indian nuclear tests," *Strategic Analysis*, Vol. 22, No. 3 (1998), 493-494; John W. Garver, "The Restoration of Sino-Indian Comity following India's Nuclear Tests, *The China Quarterly*," No. 168 (2001), 865-889
[590] Hans M. Kristensen and Matt Korda, "Indian Nuclear Forces, 2018," *Bulletin of the Atomic Scientists*, Vol. 74, No. 6, 364, accessed December 31, 2019,

Beijing believes it can ensure deterrence because it has a qualitative and quantitative edge over India. The "right deployment methods of nuclear weapons [of China]," according to Li Bin in 2016, helps China to maintain superiority over India.[591] Moreover, India and China maintain NFU pledges, bringing a level of stability to their nuclear relations.[592] Ashley Tellis has also highlighted that India's foreign policy remained largely defensive throughout the Cold War.[593]

Following the 1998 nuclear test, the US imposed economic sanctions on India: however, the Bush administration removed all sanctions in September 2001. On the assumption that India shares a common interest with the US in balancing China's rise, Washington began to bolster Dehli as a counterweight against China by signing the "New Framework for the US-India Defense Relationship" and "Civil Nuclear Cooperation Initiative" in 2005.[594] In 2008, the US lobbied to get India a waiver to enter the Nuclear Supplier Group (NSG) to help India access nuclear-related technologies.[595] With PM Narendra Modi in power, India began to join regional alliances against China. It renewed the India-US Defense Framework Agreement in 2015, and joined the QUAD, traveling to the first official meeting in 2017 in the Philippines.[596] Tellis writes that "Modi's vision, strictly speaking, envisages India becoming a traditional great power – an inescapable conclusion if the desire for multipolarity at the global level has any consequential meaning."[597] Against this background, Indian Defense Minister Rajnath Singh's statement made in 2019, "till today, our nuclear policy is 'no first use,' what happens in future depends on the circumstances," suggests India could give up its NFU policy if necessary, makes sense.[598]

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https://www.tandfonline.com/doi/pdf/10.1080/00963402.2018.1533162?needAccess=true; Jonathan McLaughlin, "India's Expanding Missile Force," December 20, 2019, accessed January 22, 2020, https://www.wisconsinproject.org/indias-expanding-missile-force/

[591] Li Bin, "Xiangbi Shuliang Zhiliang Caishi Wangdao" [Compared to numbers, quality is the king], Paper, April 2, 2016, accessed December 30, 2019, http://www.thepaper.cn/newsDetail_forward_1451364

[592] Yao Yunzhu, "Linking Strategic Stability and Ballistic Missile Defense," in *The China-India Nuclear Crossroads*, ed. Lora Saalman (Washington, DC: Carnegie Endowment for International Peace, 2012), 71

[593] Ashley J. Tellis, "India as a Leading Power," Carnegie Endowment for International Peace, April 4, 2016, accessed December 30, 2019, http://carnegieendowment.org/files/CP_268_Tellis_India_final1.pdf

[594] "US-India Relations 1947-2020," *CFR*, accessed December 24, 2021, https://www.cfr.org/timeline/us-india-relations

[595] Ibid

[596] Ibid

[597] Yunzhu, "Linking Strategic Stability and Ballistic Missile Defense," 71

[598] Toby Dalton, "Much Ado about India's No-First-Use Nuke Policy," September 26, 2019, accessed December 28, 2019, https://carnegieendowment.org/2019/09/26/much-ado-about-india-s-no-first-use-nuke-policy-pub-79952

China's threat perception of India began to change when the US signed the nuclear deal with India in 2008[599] and joined the NSG, which led India to sign nuclear cooperation agreements with the states of the US, Russia, France, UK, South Korea, Canada, Argentina, Kazakhstan, Mongolia, Australia, Sri Lanka, Japan Vietnam, Bangladesh, Czech Republic, and Namibia.[600] While expressing concern, China maintained that both the deal and the wavier violate the NPT in many ways, and they opened the door for further nuclear proliferation. [601]

The deal gave the impression that India had become a non-NPT *de facto* nuclear power. Moreover, some Chinese scholars have claimed the nuclear deal is a key factor in the US-India strategic relationship designed to balance China's power in the Indo-Pacific.[602]

As Tellis noted,

> the [Bush] administration's own antipathy to nuclear arms control agreements such as the Comprehensive Test Ban Treaty and the Fissile Material Cut-off Treaty, …coupled with its strong expectation of an eventual renewal of great-power competition, allowed both realist and neoconservative factions within the administration to take a more relaxed view of New Delhi's emerging nuclear capabilities.[603]

As such, the US-India nuclear deal persuaded China to re-evaluate its strategic threat perception, as Beijing concluded that the threat from India's nuclear weapons grew from low to medium, with China facing a greater level of vulnerability than before.[604]

One major concern for China was the grey area between India's civil and military nuclear facilities, dual-use goods, insufficiently safeguarded facilities, and fissile material

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[599] Jayshree Bajoria and Esther Pan, "The U.S.-India Nuclear Deal," *Council on Foreign Relations*, November 5, 2010, (last updated), accessed January 22, 2020, https://www.cfr.org/backgrounder/us-india-nuclear-deal

[600] "India," *NTI*, Last Updated November 2019, accessed December 31, 2019, https://www.nti.org/learn/countries/india/nuclear/

[601] Mohan Malik, "China Responds to the U.S.-India Nuclear Deal," *The Jamestown Foundation*, China Brief, Vol. 6, Issue 7, (2006), accessed December 24, 2021, https://jamestown.org/program/china-responds-to-the-u-s-india-nuclear-deal/

[602] George Perkovich, "Global implications of the U.S.-India deal," *Dædalus Journal of the American Academy of Arts & Sciences*, Volume 2 Winter 2010, https://www.amacad.org/sites/default/files/daedalus/downloads/Wi2010_On-the-Global-Nuclear-Future-Vol-2.pdf; M. S. Kohli and Kenneth Conboy, *Spies in the Himalayas: Secret Missions and Perilous Climbs* (Lawrence: University of Kansas Press, 2002).

[603] Ashley J. Tellis, "India as a New Global Power: An Action Agenda for the United States," *Carnegie Endowment for International Peace*, 2005, 13

[604] Malik, "China Responds to the U.S.-India Nuclear Deal"; Li Bin, "Chinese Thinking on Nuclear Weapons," *Arms Control Today*, December 2015, accessed December 30, 2019, https://www.armscontrol.org/act/2015-12/features/chinese-thinking-nuclear-weapons

production not monitored by IAEA and NSG technical control procedures.[605] After the US-India nuclear deal, India now has access to international nuclear cooperation, which could be a means to significantly improve its nuclear arsenal relative to its capabilities. Therefore, it is likely that India would not join negotiations with other countries over the Fissile Material Cut-off Treaty (FMCT), the Comprehensive Test Ban Treaty (CTBT), the Australia Group (AG), and the Missile Technology Control Regime (MTCR).

The announcement of a Defense Technology and Trade Initiative (DTTI) in 2012 revealed another level of US-India strategic cooperation, which paved the way for India to participate in joint research and development ventures with the US.[606] In January 2015, the US and India agreed to initiate collaboration under DTTI on,

> four pathfinder projects and two pathfinder initiatives, which are currently at various stages of execution. In December 2015, the two sides also identified opportunities for bilateral cooperation in the production and design of jet engine components… Later in July 2016, both states decided to broaden its agenda by setting up five new Joint Working Groups on: Naval Systems; Air Systems, Intelligence, Surveillance and Reconnaissance; Chemical and Biological Protection; and Other Systems.[607]

In 2017, the US, India and Japan, and Australia re-formed the Quadrilateral Security Dialogue (QUAD) to secure "a free and open Indo-Pacific, taking joint action against terrorism, and promoting a rules-based system."[608] The QUAD was first formed and met briefly in 2007, before coming apart when Australia pulled out of QUAD in 2008.[609] To many, it is a bulwark against rising Chinese economic and military assertiveness in the region.[610] In November 2020, all four states conducted a joint military exercise in the

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[605] Mark Hibbs, "Admitting Non-NPT Members: Questions for the NSG," *Arms Control Wonk* (blog), May 15, 2016, accessed December 31, 2019, http://www.armscontrolwonk.com/archive/1201412/admitting-non-npt-members-questions-for-the-nsg/.

[606] "Brief on India-U.S. Relations," *Ministry of External Affairs, Government of India*, accessed January 22, 2020, https://mea.gov.in/Portal/ForeignRelation/India_US_brief.pdf

[607] Ibid

[608] "Defining the Diamond: The Past, Present, and Future of the Quadrilateral Security Dialogue," *CSIS Briefs*, March 16, 2020, accessed July 28, 2021, https://www.csis.org/analysis/defining-diamond-past-present-and-future-quadrilateral-security-dialogue; Sophie Eisentraut and Bart Gaens, "The US-Japan-India-Australia Quadrilateral Security Dialogue," *Finish Institute of International Affairs*, May 2018, January 22, 2020, https://www.fiia.fi/wp-content/uploads/2018/05/bp239_quad.pdf

[609] Ibid

[610] Joseph Stepansky, "What to watch as Indo-Pacific 'QUAD' leaders meet for first time," *Aljazeera*, March 11, 2021, accessed March 30, 2021, https://www.aljazeera.com/news/2021/3/11/what-to-watch-as-indo-pacific-quad-leaders-meet-for-first-time

Indian Ocean.[611] The first meeting at the leadership level took place in January 2021, involving the four heads of state.[612]

China views the QUAD as a threat and an attempt to contain China's increase of power and a threat to regional organizations, such as the centrality of ASEAN.[613] Moreover, the QUAD's Indo-Pacific states are being criticized for involving extra-regional states, such as the US, in the region to preserve US hegemony. Chinese analysts, like Shen Yi, see the inclusion of India in the QUAD as boosting the alliance and helping it gang up on China.[614] While responding to a question in October 2020, China's Foreign Ministry spokesperson Hua Chunying said,

> This is now the 21st century and we are living in an era of globalization. The interests of all the countries are so intertwined that organizing closed and exclusive cliques will not help to build mutual trust and cooperation, especially when we are faced with urgent tasks of fighting the pandemic and reviving the world economy.[615]

To conclude this section, on the basis of capability and intent criteria, analysts place India in a medium-level category concerning China's nuclear threat perception.[616] The nuclear force capabilities of India are growing. The political relationship between India and China is deteriorating, and the trend of India's foreign policy and external engagement with the US/QUAD, that is leading China to elevate its threat perception of India. A number of factors will determine how China's medium-level threat perception of India evolves in the future. These include India's strategic partnerships, China-India border disputes, India's stance on Tibet, and India's conventional military capabilities trends.

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[611] Ibid

[612] Evan A. Feigenbaum, and James Schwemlein, "How Biden Can Make the QUAD Endure," *Carnegie Endowment for International Peace*, March 11, 2021, accessed March 30, 2021, https://carnegieendowment.org/2021/03/11/how-biden-can-make-quad-endure-pub-84046

[613] Chen Jimin, "The Evolutionary Logic and Strategic Vision of American Indo-Pacific Strategy," *China-US Focus*, November 4, 2020, accessed December 24, 2021, http://cn.chinausfocus.com/m/42080.html; Joel Wuthnow, "China's Shifting Attitude on the Indo-Pacific QUAD," *War On The Rocks*, April 7, 2021, accessed December 24, 2021, https://warontherocks.com/2021/04/chinas-shifting-attitude-on-the-indo-pacific-quad/

[614] Jeff M. Smith, "How to Keep India All-In on the QUAD," *Foreign Policy*, June 25, 2021, accessed July 28, 2021, https://foreignpolicy.com/2021/06/25/india-quadrilateral-security-dialogue-us-australia-japan-china-russia/; Rajeswari Pillai Rajagopalan, "How China Strengthens the Quad," *The Diplomat*, September 4, 2020, accessed July 28, 2021, https://thediplomat.com/2020/09/how-china-strengthens-the-quad/

[615] Rajagopalan, "How China Strengthens the QUAD," *The Diplomat*

[616] Lora Saalman, "Divergence, Similarity and Symmetry in Sino-Indian Threat Perceptions," *Journal of International Affairs*, Vol. 64, No. 2, (2011), 169-194; Hu and Meng, "The US Indo-Pacific Strategy and China's Response," 143-176; Tanvi Madan, The U.S.-India Relationship and China, *Brookings*, September 23, 2014, accessed January 1, 2020, https://www.brookings.edu/research/the-u-s-india-relationship-and-china/

For instance, the 2017 China-India border standoff, also known as the Doklam standoff, was a low-intensity conflict, started when Chinese army engineers attempted to build a road through the Goklam plateau, an area claimed by both China and Bhutan. Indian army soldiers, following coordination with the Bhutan government, intervened and stopped the Chinese engineers from construction.[617] During the standoff, Indian and Chinese troops were placed on high alert. Border disputes like this one can trigger a situation where a crisis escalates, and also, a crisis involving India-Pakistan could draw China in. According to Toby Dalton and George Perkovich,

> China is unlikely to intervene with its own nuclear forces, especially if India had not initiated the use of nuclear weapons in the conflict. However, as China pursues large infrastructure projects in Pakistan, and thousands of Chinese nationals reside there and could become casualties of Indian nuclear weapons, Beijing's stakes in a potential Indo-Pakistani nuclear conflict will grow significantly.[618]

Following the Doklam standoff, China has deployed at least one long-range strategic bomber H-6K close to its border with India.[619] Likewise, India is currently deploying air and the S-400 missile defense system to the Punjab sector, close to China's border.[620] Amidst these scenarios, India, with its maturing nuclear weapons forces, is categorized as a medium-level threat in China's threat perception matrix.

3.3.3 **The United States: High Intent and Extensive Capability**

The US has a vastly larger and more sophisticated nuclear capability compared to China.[621] According to the *Bulletin of Atomic Scientists* (BAS) 2020 report, the US maintains a stockpile of 5,800 nuclear weapons. Out of these, approximately 2,000 are retired and awaiting dismantlement, 1,750 are deployed, and the remaining 2,050 are kept

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[617] Joel Wuthnow, Satu Limaye, and Nilanthi Samaranayake, "Doklam, One Year Later: China's Long Game In The Himalayas," *War On The Rocks*, June 7, 2018, accessed December 24, 2021, https://warontherocks.com/2018/06/doklam-one-year-later-chinas-long-game-in-the-himalayas/

[618] Toby Dalton and George Perkovich, "India's Nuclear Options and Escalation Dominance," *Carnegie Endowment for International Peace*, May 19, 2016, http://carnegieendowment.org/2016/05/19/india-s-nuclear-options-and-escalation-dominance/iydh

[619] Minnie Chen, "China Sends Long-Range Bomber to Border with India," November 16, 2021, accessed December 25, 2021, https://www.scmp.com/news/china/military/article/3156258/china-sends-long-range-bomber-border-india

[620] Manjeet Negi, "India Deploys First S-400 Air Defence System in Punjab Sector," *India Today*, December 21, 2021, accessed December 25, 2021, https://www.indiatoday.in/india/story/india-russia-s-400-air-defence-missile-system-punjab-sector-1890141-2021-12-21

[621] Joanne Tompkins, "How U.S. Strategic Policy is Changing China's Nuclear Plans," *Arms Control Association*, accessed March 30, 2021, https://www.armscontrol.org/act/2003-01/features/us-strategic-policy-changing-china%E2%80%99s-nuclear-plans; Haynes, "China's Nuclear Threat Perceptions," 44-52

in storage.[622] Out of the total deployed, 800 warheads are assigned to 400 ICBMs (200 warheads for 200 Mk-21/SERV ICBMs and the remaining 600 warheads for 200 Mk-12A ICBMs having MIRV capability), 1,920 SLBMs are assigned to the US Navy, and 850 warheads are kept for bombers. The remaining 230 are non-strategic nuclear warheads.[623]

Table 7. Chinese vs. United States Strategic Nuclear Forces 2020

Type	China		United States	
	Launchers	Warheads	Launchers	Warheads
Bombers	20	20	107/60	850
Land-based ballistic missiles	280	258	400	800
Sea-based ballistic missiles	72	72	240	1920

Non-strategic nuclear warheads are further divided into three versions: B61-3, B61-4, and B61-10. Approximately 80 warheads of the B61-10 version were retired in 2016, and the remaining 150 are deployed at different airbases in Europe.[624] Moreover, approximately 2,385 nuclear warheads are retired from service and awaiting dismantlement. The US nuclear inventory is *more than twelve times greater* than China's nuclear forces.

Since 1994, US administrations have published Nuclear Posture Reviews (NPR), a primary document outlining US nuclear threat perception, its nuclear weapons policy doctrine, and the nuclear forces it deploys to achieve policy goals.[625] In the 1994 NPR, a nuclear contingency over Taiwan involving China was briefly discussed: however, it was discussed in more detail in the 2002 NPR noting,

> In setting requirements for nuclear strike capabilities, distinctions can be made among the contingencies for which the United States must be prepared. Contingencies can be categorized as immediate, potential or unexpected. Current examples of immediate contingencies include an Iraqi attack on Israel or its neighbors, a North Korean attack on South Korea, or a military confrontation over the status of Taiwan.[626]

[622] Hans M. Kristensen and Matt Korda, "US Nuclear Force 2020," *Bulletin Of The Atomic Scientists* 2020, Vol. 76, No. 1, (2020), 46-60
[623] Ibid
[624] Ibid
[625] Philipp C. Bleek, "Nuclear Posture Review Leaks; Outlines Targets, Contingencies," *Arms Control Association*, accessed December 25, 2021, https://www.armscontrol.org/act/2002-04/press-releases/nuclear-posture-review-leaks-outlines-targets-contingencies
[626] "Excerpts of Classified Nuclear Posture Review," *Nuclear Posture Review Report 2002*, January 8, 2002, accessed May 1, 2019, https://fas.org/wp-content/uploads/media/Excerpts-of-Classified-Nuclear-Posture-Review.pdf

The 2002 NPR emphasized the enhancement of military flexibility, outlined a new triad based on offensive strike systems (old strategic nuclear triad), defensive systems (BMD systems), and defense infrastructure (new defense infrastructure development).[627] It also highlighted apprehensions over hardened and deeply buried bunkers (pointing towards China's hidden tunnels), rejected nuclear arms control arrangements, such as the ABM Treaty and CTBT.[628] These measures were part of the US effort to secure nuclear primacy. The nuclear primacy can be well understood when the NPR emphasizes that the US should be prepared to use nuclear weapons against China, noting, "due to the combination of China's still developing strategic objectives and the ongoing modernization of its nuclear and non-nuclear forces, China is a country that could be involved in an immediate or potential contingency."[629]

Compared to the 2002 NPR, the 2010 Obama administration's NPR placed China alongside Russia as a key nuclear weapons state in Washington's thinking. China's growing economic, political and military clout in the Indo-Pacific placed China higher in US' security matrix. Prior to the 2010 NPR, the US never accepted or desired to maintain strategic stability with China. However, in the 2010 NPR, the US desire to maintain "strategic stability" with China is expressed.[630] The 2010 NPR expresses concerns about the "qualitative and quantitative modernization of its [China's] nuclear arsenal [warheads]," the lack of transparency in its nuclear weapons program, and its future intentions.[631] The desire to maintain "strategic stability" in the 2010 NPR suggested the US was willing to accept a mutual deterrence relationship with China and that Washington "[would] pursue high-level, bilateral dialogues on strategic stability with both Russia and China which are aimed at fostering more stable, resilient, and transparent strategic relationships."[632] However, the 2010 NPR also said the US would,

> retain the capability to forward-deploy U.S. nuclear weapons on tactical fighter-bombers and heavy bombers, and proceed with full scope life extension for the B-61 bomb including enhancing safety, security, and use control… [The US will] continue to maintain and develop long-range

[627] Charles D. Ferguson, "Nuclear Posture Review," *NTI*, July 31, 2002, accessed December 26, 2021, https://www.nti.org/analysis/articles/nuclear-posture-review/
[628] Ibid
[629] "Excerpts of Classified Nuclear Posture Review," *Nuclear Posture Review Report 2002*
[630] "US Nuclear Posture Review 2010," https://dod.defense.gov/Portals/1/features/defenseReviews/NPR/2010_Nuclear_Posture_Review_Report.pdf
[631] Ibid, v
[632] Ibid, x

> strike capabilities that supplement U.S. forward military presence and strengthen regional deterrence.[633]

In other words, even the 2010 NPR seemed to be hedging – ensuring or creating "strategic stability" was desirable, yet it did not contain ambitions to reduce US nuclear capabilities substantively – indeed, it was willing to develop new "long-range strike capabilities" that, from Beijing's point of view, did not appear consistent with a posture to ensure strategic stability unless that stability rested on relative capabilities tilted in favor of the US.[634]

Later, in the 2018 NPR, the US identified a number of initiatives to maintain a qualitative and quantitative edge over China, reflecting that the US "does not admit that it is vulnerable to China's strategic forces." [635] The 2018 NPR, under the Trump administration, took an assertive stance towards "great power competition."[636] The NPR further emphasized that "effective U.S. deterrence of nuclear attack and non-nuclear strategic attack requires ensuring that potential adversaries do not miscalculate regarding the consequences of nuclear first use, either regionally or against the United States itself."[637] The 2018 NPR contained some notable changes from the 2010 NPR. The first is that it declared nuclear weapons might be used in retaliation to a non-nuclear attack. A non-nuclear attack from China against the US forces in the region, stationed in Japan, Gaum or the continental US, may invite a nuclear retaliation from the US. The second is that the 2018 NPR removed the call for "maintaining strategic stability" made in the 2010 NPR and proposed new nuclear capabilities for new nuclear options, discussed in Chapter Seven. Such a move reflected the intentions of the Trump administration, its desire to lead the competition in the nuclear realm and maintain nuclear primacy.[638] Previously, the Bush administration was known to have an assertive NPR, attempting to acquire nuclear primacy at the global level, but the Trump administration's NPR emphasizes the attaining of primacy at both regional and global levels. The regional level aspect of primacy reflects

[633] Ibid, xiii-xiv
[634] Ibid, x; Yunzhu Yao, "A Chinese Perspective on the Nuclear Posture Review," *CEIP*, May 6, 2010, accessed July 28, 2021, https://carnegieendowment.org/2010/05/06/chinese-perspective-on-nuclear-posture-review-pub-40758
[635] Hugh White, "To Reassure U.S. Allies in Asia, Admit Mutual Vulnerability With China," *War On The Rocks*, June 18, 2018, accessed December 25, 2021, https://warontherocks.com/2018/06/to-reassure-u-s-allies-in-asia-admit-mutual-vulnerability-with-china/
[636] Nuclear Posture Review 2018, https://media.defense.gov/2018/Feb/02/2001872886/-1/-1/1/2018-NUCLEAR-POSTURE-REVIEW-FINAL-REPORT.PDF
[637] Ibid
[638] White, "To Reassure U.S. Allies In Asia"

a special focus on nuclear weapons force modernization concerning regional level contingencies, possibly involving China, discussed in Chapter Six.

According to one Chinese nuclear expert, the 2018 NPR attempts to use nuclear weapons to pursue regional and global hegemony.[639] Another Chinese expert critically assessed the 2018 NPR, claiming it contained faulty assumptions about China's nuclear weapons policy.[640] He views the assessment in the 2018 NPR that "our [the US] tailored strategy for China is designed to prevent Beijing from mistakenly concluding that it could secure an advantage through the limited use of its theater nuclear capabilities…" which can not be justified for two reasons.[641] Firstly, China has NFU, and it will use nuclear weapons only in retaliation to a nuclear strike, hence it gives China no advantage. Secondly, China does not have low-yield nuclear weapons that would be required to make this capability a reality.[642]

In short, the 1994 and 2002 NPR suggested that nuclear weapons could be used against China involving a nuclear contingency over Taiwan. The 2010 NPR viewed China as an emerging challenge that needed to be addressed but that maintaining strategic stability was key to managing tensions. And the 2018 NPR views China as a serious challenge and threat to the US-led regional security architecture, necessitating new policies and capabilities (a detailed discussion appears in Chapter Six) to maintain a regional balance in US' favor.

3.3.3.1 The US BMD System and China

China's view of the US threat in the nuclear realm is exacerbated by US Ballistic Missile Defense (BMD) systems. In January 2019, while unveiling the US missile defense strategy, President Trump said, "our goal is simple: To ensure we can detect and destroy any missile launched against the United States - anywhere, anytime, anyplace."[643] This is a significant shift from previous US administrations, who constantly said they sought BMD to defend solely against rogue states in an attempt to assuage the concerns of Russia

[639] Li Bin, "Will US Nuclear Posture Review See a Return to Hegemony?" *Global Times*, January 25, 2018, accessed July 28, 2021, http://www.globaltimes.cn/content/1086434.shtml.
[640] Ibid
[641] "US Nuclear Posture Review 2010," 32
[642] Bin, "Will US Nuclear Posture Review see a Return to Hegemony?"
[643] Phil Stewart, "Trump Missile Defense Review Calls North Korea 'Extraordinary Threat," January 17, 2019, accessed January 22, 2020, https://www.reuters.com/article/us-usa-defense-missiles/trump-missile-defense-review-calls-north-korea-extraordinary-threat-idUSKCN1PB04V

and China that the US sought nuclear primacy – a capability to overturn MAD.[644] China views US BMD capabilities as a threat to its security and general strategic stability. China's view of the US is based on both material capability and intent.[645] Furthermore, physics is physics, and the US BMD system's operational deployments against North Korea, for example, cover the same trajectory as that required for China's missiles to strike US military assets and bases in the Indo-Pacific and the US homeland.[646] Therefore, it is likely that the US would seek to intercept missiles fired from China by its BMD systems wherever they are located – it is simply implausible to believe that a state would not use a defensive system to defend against a nuclear attack if they had defensive systems in place.[647] This speaks to why Beijing and Moscow never trusted US assurances that Washington's BMD would not be used against them if a nuclear conflict broke out.[648]

China's nuclear-capable missile force is significantly smaller than the US and Russian forces. According to the Pentagon's 2019 *Missile Defense Review* (MDR 2019), China has as many as 125 nuclear missiles with which it can threaten the US.[649] Approximately 80 of these can reach the US mainland (the others can threaten other US territories in the Indo-Pacific).[650] According to *Defense News*, the US has 44 ground-based interceptors (GBI) in place at "Fort Greely, Alaska, and Vandenberg Air Force Base, California, with plans to add twenty-two additional missile silos at Fort Greely to support twenty more GBIs" by 2025. [651] Even though the US intercept testing record is imperfect (11

[644] Reuben Michael Steff, *Deterrence, Global Security and the Long Road to the Deployment of the Bush Administration's Missile Defense System* (Doctoral of Philosophy Thesis, University of Otago, 2012), 112-142

[645] Haynes, "China's Nuclear Threat Perceptions," 44-52; Tompkins, "How U.S. Strategic Policy is Changing"

[646] Qiu Yong, "A Few Comments on the US Ballistic Missile Defense System," in *Progress Despite Disagreements: The Sixth China-US Strategic Dialogue on Strategic Nuclear Dynamics*, Ralph Cossa, Brad Glosserman, and Matt Pottinger eds. (Washington, DC: Center for Strategic and International Studies, 2011), 29-37

[647] Yong, "A Few Comments on the US Ballistic Missile Defense System," 29-37

[648] Reuben Steff, *Strategic Thinking, Deterrence and the US Ballistic Missile Defense Project: From Truman to Obama* (London: Routledge, 2016; Nicholas Khoo and Reuben Steff, *Security at a Price: The International Politics of U.S. Ballistic Missile Defense* (London: Rowman and Littlefield, 2017), 50-70, 123-130

[649] US Defense Department. "Missile Defense Review, 2019." Office of the Secretary of Defense, 2019. https://media. defense.gov/2019/Jan/17/2002080666/-1/-1/1/2019- MISSILE-DEFENSE-REVIEW.PDF

[650] Hans M. Kristensen and Matt Korda, "Chinese Nuclear Forces, 2019, Bulletin of the Atomic Scientists," Vol. 75, No. 4, 173, accessed January 5, 2020, https://www.tandfonline.com/doi/pdf/10.1080/00963402.2019.1628511?needAccess=true

[651] Jen Judson, "Pentagon Hits Pause on Redesign of Critical Homeland Missile Defense Component," May 28, 2019, accessed January 5, 2020, https://www.defensenews.com/pentagon/2019/05/28/pentagon-hits-pause-on-redesign-of-critical-homeland-missile-defense-component/; Congressional Research Service, "Navy Aegis Ballistic Missile Defense (BMD) Program: Background and Issues for Congress," Updated February 25, 2021, accessed May 18, 2021, https://fas.org/sgp/crs/weapons/RL33745.pdf

successful intercepts out of 19 tests) and China's missiles could contain countermeasures to confuse US BMD, in the realm of nuclear strategy, China has to treat US BMD systems as though they will work, and there is always the possibility that the US downplays the capacity of its capabilities.[652] Theoretically, to ensure a retaliatory strike, China needs to have more than forty-four nuclear warheads and missiles – a number more than the US interceptors – that could reach the continental US. Alternatively, China can loose only forty-eight missiles to the US in a first strike to guarantee it can launch a secure second strike.[653]

In addition to US homeland GBI, by the end of FY 2022, the US aims to increase the number of BMD-capable Navy Aegis ships to 48, and it is further planning to increase the number up to 65 by FY 2025.[654] BMD-capable Navy Aegis ships can defend "against short, medium, and intermediate-range ballistic missiles during their midcourse phase with an emphasis on the ascent stage."[655] Additionally, the US also operates seven batteries of THAAD, and each can carry 48-72 interceptors. This includes three batteries with six launchers each (eight interceptors per launcher as per standard) deployed in Hawaii, Guam, and South Korea.[656] Two batteries are deployed in the United Arab Emirates, and one in the Kingdom of Saudi Arabia, and one temporarily in Romania.[657] The US has deployed a THAAD radar system in Japan which relays data to Aegis BMD ships, the THAAD radar: however, is not paired with Aegis radar and SM-3 Block IA and Block IB interceptors.[658] THAAD is designed to counter short and medium-range ballistic missiles: however, there is a potential to increase the range of its interceptors and to connect it with other BMD systems such as Patriot.[659]

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[652] Kingston Reif, "Current U.S. Missile Defense Programs at a Glance," *Arms Control Association*, August 2019, accessed December 27, 2021, https://www.armscontrol.org/factsheets/usmissiledefense

[653] Hans M. Kristensen and Matt Korda, "Chinese Nuclear Forces," *Bulletin of the Atomic Scientists 2020*, Vol. 76, No. 6, (2020), 444

[654] "Navy Aegis Ballistic Missile Defense (BMD) Program: Background and Issues for Congress," *Congressional Research Service (CRS)*, December 9, 2021, accessed December 27, 2021, https://sgp.fas.org/crs/weapons/RL33745.pdf; Reif, "Current U.S. Missile Defense Programs at a Glance"

[655] Reif, "Current U.S. Missile Defense Programs at a Glance"

[656] Ibid

[657] Robert N. Durr, "THAAD redeploys from Romania," *US Army*, September 4, 2019, accessed July 29, 2021, https://www.army.mil/article/226644/thaad_redeploys_from_romania; Matt Korda and Hans M. Kristensen, "US Ballistic Missile Defenses, 2019," *Bulletin of the Atomic Scientists*, Vol. 75, No. 6, (2019) 300; Loren Thompson, "Why The Pentagon's THAAD Missile Defense System is becoming Critical to Protection of the U.S. Homeland," *Forbes*, March 23, 2020, accessed July 29, 2021, https://www.forbes.com/sites/lorenthompson/2020/03/23/why-the-pentagons-thaad-missile-defense-system-is-becoming-critical-to-protection-of-the-us-homeland/?sh=d0f0dff55a69

[658] Reif, "U.S. and Allied Ballistic Missile Defenses in the Asia-Pacific Region"

[659] Korda and Kristensen, US ballistic missile defenses, 2019, 296

In a conference report on the *Sixth China-US Strategic Dialogue on Strategic Nuclear Dynamics 2011*, a technical expert from China concluded,

> when we have technical exchanges with Russian experts, they think the US is exaggerating the threat of missiles launched from North Korea and Iran, and in fact, the trajectories [of US missile interceptors] seem to be designed for Russia and China.[660]

The report quotes another Chinese representative saying that the US could advance from 30 (in 2011, the US had 30 interceptors, according to the report) to 300 interceptors in the future, broadening its BMD program.[661] Though the number of GBIs will be 64 by 2023, the sum of BMD interceptors, including Aegis and THAAD, has grown to greater than 300.[662] In addition, some systems, such as Aegis using SM-3 missiles, have also been used to shoot down satellites, making them multiple-use anti-missile, anti-air warfare (air-defense operations), and anti-satellite systems.[663] These capabilities together could prove pivotal during the outbreak of a modern conflict, given the criticality of space systems to modern high-intensity warfare. For many in China, including academics and policymakers in government and the PLA, the US BMD system has weakened China's strategic and tactical nuclear retaliatory capabilities. It could also intercept its conventional missiles in the event of a conflict.[664] These analysts also believe the system is driven solely by a determination to enhance US offensive military capabilities and strategies with impunity – what Jeffery Knop calls "unidirectional deterrence."[665] In short, the view here is that the US wants to be equipped with a 'spear and shield' – to attack, it has to be able to do so without the fear of being attacked. Unidirectional deterrence would allow the US to deter others but not be deterred in kind should it need to strike out.

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[660] "Conference Report," in *Progress Despite Disagreements: The Sixth China-US Strategic Dialogue on Strategic Nuclear Dynamics*, Ralph Cossa, Brad Glosserman, and Matt Pottinger eds. (Washington, DC: Center for Strategic and International Studies, 2011), 11

[661] Ibid

[662] Ibid

[663] "Navy Aegis Ballistic Missile Defense (BMD) Program: Background and Issues for Congress 2021," *CRS*, 40

[664] Wu Riqiang, "China's Anxiety About US Missile Defence: A Solution," *Survival*, Vol. 55 No. 5, (2013), 29-52; Qiu Yong, "Analysis on the ASAT Capability of the GMD Interceptor," presentation at the *Sixteenth International Summer Symposium on Science and World Affairs, Beijing, China, July 17–25*, 2004; Li Bin, "Impact of U.S. NMD on Chinese Nuclear Modernization," Presentation to *Pugwash Meeting No. 261, Seoul, South Korea, April 2001*, http://www.pugwash.org/reports/ rc/rc8e.htm; Li Bin, Zhou Baogen, and Liu Zhiwei, "Missile Defense: China Will Have to Respond," *Bulletin of Atomic Scientists*, Vol. 57, No. 6, (November/December, 2001), 25-28; Hui Zhang, "Action/Reaction: U.S. Space Weaponization and China," *Arms Control Association*, https://www.armscontrol.org/act/2005-12/features/actionreaction-us-space-weaponization-china

[665] Jeffrey Knopf, "The Fourth Wave in Deterrence Research," *Contemporary Security Policy*, Vol. 31, No. 1, (2010) 1-33

Arguably, such offensive and defensive capabilities favor pre-emptive and first-use strategies, leaving adversaries with fewer means of reprisal – in turn, they are compelled out of necessity to strengthen their nuclear weapons program to restore deterrence vis-à-vis the US.[666] However, the US BMD system is just one factor in what China identifies as a major shift in US grand strategy towards enhanced competition with China that occurred under President Trump (and is seemingly now perpetuated in the Biden administration, see Chapter Six).[667]

Another intensifying concern in Beijing is US nuclear submarines carrying Submarine SLBMs. Under President Barack Obama's 'Pivot to Asia' policy, also known as the US rebalancing strategy, the US announced the intention to rebalance global military deployments towards the Indo-Pacific. Former US Secretary of Defense, Leon Panetta, in June 2012, at the annual Shangri-La Dialogue conference, stated,

> By 2020, the [US] navy will reposture its forces from today's roughly 50-50% split between the Pacific and the Atlantic to about a 60-40% split between those oceans. That will include six aircraft carriers in this region, a majority of our cruisers, destroyers, combat ships and submarines.[668]

The website of the United States Naval Institute (USNI) shows that as of December 28, 2021, one Expeditionary Strike Group (ESG) and two Carrier Strike Groups (CSG), with dozens of ships were operating in the Indo-Pacific.[669] According to Li Bin, the US had planned to deploy most ballistic missile submarines to the Pacific to increase the number of targets that could be hit in China.[670] US submarines in the Pacific could carry more

[666] Keir Lieber and Daryl Press, "The New Era of Counterforce: Technological Change and the Future of Nuclear Deterrence," *International Security*, Vol. 41, No. 4, (2017), 11

[667] Aasma Khaalid, "Biden is keeping key parts of Trump's China trade policy. Here's why," *NPR*, October 4, 2021, accessed December 28, 2021, https://www.npr.org/2021/10/04/1043027789/biden-is-keeping-key-parts-of-trumps-china-trade-policy-heres-why; Alex Leary and Bob Davis, "Biden's China Policy Is Emerging: and It Looks a Lot Like Trump's," *The Wall Street Journal*, June 10, 2021, accessed December 28, 2021, https://www.wsj.com/articles/bidens-china-policy-is-emergingand-it-looks-a-lot-like-trumps-11623330000; Ana Swanson, "Biden's China Dilemma: How to Enforce Trump's Trade Deal," *The New York Times*, December 15, 2021, accessed December 28, 2021, https://www.nytimes.com/2021/12/15/business/economy/china-trump-trade-deal-biden.html

[668] Leon Panetta: "US to deploy 60% of navy fleet to Pacific," June 2, 2012, accessed January 24, 2020, https://www.bbc.com/news/world-us-canada-18305750,

[669] "USNI News Fleet and Marine Tracker: Nov. 29, 2021," *USNI*, November 29, 2021, accessed December 28, 2021, https://news.usni.org/2021/11/29/usni-news-fleet-and-marine-tracker-nov-29-2021

[670] Li Bin and Nie Hongyi, "An Investigation of China–U.S. Strategic Stability," May 11, 2009. This is a translation of an article published in Chinese in *World Economics & Politics*, No. 2, 13-19. trans. Gregory Kulacki. Accessed January 8, 2020, https://ucsusa.org/sites/default/files/2019-09/Li-and-Nie-translation-final-5-22-09.pdf

than 800 nuclear warheads collectively.[671] The degree of readjustment shows that the Indo-Pacific is a new center of international political gravity. Furthermore, nuclear submarines are better at dispersion, mobility, and concealment than air or land-based nuclear forces.[672] China does not, and may never, have the capability to take out every US submarine, and thus US SLBMs secure the second strike capability of the US, hence preserving US deterrence. Moreover, due to low detectability, quick mobility, and concealment, SLBMs can also contribute to US first-strike capabilities.[673] In the future, Australia's nuclear attack submarines are to be built under the AUKUS security alliance and will complement US SSBN capabilities and its ability to prevail in a conflict.[674]

Unlike other delivery means, nuclear submarines with SLBMs bypass the "use it or lose it" pressure, a condition often associated with the use of TNWs. This pressure suggests a state may feel the need to launch its warheads in a crisis or conflict rather than lose them all to an adversary during a first or disarming strike. In other cases, a state might lose connectivity from command and control for authorization to use its arsenal, or a state might use them accidentally, hence losing them. The SLBMs launched from proximity reduce the time to reach the target, improve accuracy, and diminish chances for an adversary to relocate ground-based movable assets such as land-based ICBMs. The US Pacific fleet of submarines can, theoretically, carry out disarming strikes against the small numbers of North Korea and China's land-based ICBMs, strategic bases, and command and control systems with a conventional missile strike.

The US development of space-based systems is also a factor that would provide the US with real-time intelligence, surveillance, and reconnaissance regardless of the weather conditions. The US 2019 BMDR states that,

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[671] Hans M. Kristensen and Matt Korda, "Nuclear Notebook: United States nuclear weapons, 2021," *Bulletin of the Atomic Scientists*, January 12, 2021, accessed December 28, 2021, https://thebulletin.org/premium/2021-01/nuclear-notebook-united-states-nuclear-weapons-2021/

[672] Ibid

[673] Ibid

[674] "Implementation of the Australia–United Kingdom–United States Partnership (AUKUS)," *The White House*, Briefing Room Fact Sheet, April 5, 2022, accessed April 11, 2022, https://www.whitehouse.gov/briefing-room/statements-releases/2022/04/05/fact-sheet-implementation-of-the-australia-united-kingdom-united-states-partnership-aukus/; Mallory Shelbourne and Sam LaGrone, "Australia to Pursue Nuclear Attack Subs in New Agreement with U.S., U.K." *USNI News*, September 15, 2021, accessed October 19, 2021, https://news.usni.org/2021/09/15/australia-to-pursue-nuclear-attack-subs-in-new-agreement-with-u-s-u-k; John Grady, "Australian Ambassador to U.S. Says AUKUS Deal Will 'Project Power Further Up' Through Indo-Pacific," *USNI News*, November 19, 2021, accessed December 1, 2021, https://news.usni.org/2021/11/09/australia-ambassador-to-u-s-says-aukus-deal-will-project-power-further-up-through-indo-pacific

> Given the significant advantages of space-basing for sensors, and potentially interceptors, particularly for boost-phase defense, MDA [Missile Defense Agency] will study development and fielding of a space-based missile intercept layer capable of boost-phase defense…[675]

For the fiscal year (FY) 2020, the White House requested $34 million "to develop and test by 2023 a prototype space-based directed-energy (laser) weapon for ICBMs during their boost phase. The program is expected to cost $380 million over five years."[676] For FY2022, Congress approved an additional $100 million.[677] The program will augment US BMD interceptor capabilities and help trace mobile targets, including mobile ICBMs, in all weathers with greater accuracy. The mobility factor of nuclear and missile inventory is central to China's retaliatory capability and these new capabilities could greatly undermine it.[678] In addition, such surveillance and precision technology of the US might undermine strategic stability. The thesis will return to this discussion when it considers the contemporary developments in the Chinese nuclear weapons program (Chapter Six) that includes a rapid build-up of three missile silos fields, which could be hosting approximately more than 300 ICBMs, is under construction in China's remote deserts that Beijing appears to have been pursuing covertly.[679]

A less considered factor in the literature, but one that informs China's nuclear threat perception, is US conventional military capabilities. The US has the most advanced and reliable conventional military capability in the world. In recent years, the US has improved its conventional military technologies relevant to strategic capabilities, through the Conventional Prompt Strike (CPS) and deployment of advanced early warning systems, which would permit the US to strike around the globe in approximately one hour.

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[675] "Current U.S. Missile Defense Programs at a Glance," Last Updated August 2019, accessed January 8, 2020, https://www.armscontrol.org/factsheets/usmissiledefense#mdr%20to%20do

[676] Ibid

[677] Jen Judson, "Congress gives missile defense agency authority to Research and Develop Laser Tech for Missile Defense," *Defense News*, December 31, 2021, accessed February 13, 2022, https://www.defensenews.com/pentagon/2021/12/30/congress-gives-missile-defense-agency-authority-to-research-and-develop-laser-tech-for-missile-defense/

[678] Tong Zhao, *Narrowing the U.S.-China Gap on Missile Defense: How to Help Forestall a Nuclear Arms Race* (Washington, DC.: CEIP, 2020), 5-58; Li Bin, "Tracking Chinese Strategic Mobile Missiles," *Science and Global Security*, No. 15 (2007) 1–30; Keir A. Lieber and Daryl G. Press, "The New Era of Counterforce: Technological Change and the Future of Nuclear Deterrence," *International Security* 41, no. 4 (Spring 2017): 9–49; Kier A. Lieber and Daryl G. Press, "U.S. Nuclear Primacy and the Future of the Chinese Deterrent," *China Security* (Winter 2007) 66–89; and Austin Long and Brendan Rittenhouse Green, "Stalking the Secure Second Strike: Intelligence, Counterforce, and Nuclear Strategy," , No 38, no. 1–2 (2015) 38–73.

[679] Matt Korda and Hans Kristensen, "A Closer Look at China's Missile Silo Construction," *Federation of American Scientists*, November 2, 2021, accessed December 28, 2021, https://fas.org/blogs/security/2021/11/a-closer-look-at-chinas-missile-silo-construction/

With these military capabilities, Chinese policymakers are collapsing the distinction between the nuclear and conventional domains; the separation between them was long a key element informing China's nuclear thinking.[680]

The idea of CPS first appeared in the 2001 *Quadrennial Defense Review* (QDR) but can be tied back to the precision munitions the US first demonstrated operationally to great effect during the Vietnam War and then again in Operation Desert Storm in 1991. The QDR notes that the US defense strategy at that time "rests on the assumption that U.S. forces have the ability to project power worldwide."[681] To perpetuate this objective in a changing strategic environment, the Bush administration's 2002 NPR called for "the integration of precision conventional weapons with strategic nuclear forces in a new category of "offensive strike" weapons.[682] The role of rogue states, growing transnational terrorist organizations, and the role of other non-state actors pressurized the US to move in this direction.[683] After two years, in 2004, the US *National Military Strategy* (NMS) set out a new global strike mission to ensure the US could deliver,

> effective global strike to damage, neutralize or destroy any objective results from a combination of precision and maneuver and the integration of new technologies, doctrine and organizations. Defeating the most dangerous threats will require persistence in force application that allows strikes against time-sensitive and time-critical targets. Ensuring capabilities are positioned and ready to conduct strikes against these targets requires the ability to sustain operations over time and across significant distances.[684]

The US focus began to change from non-state actors to state actors in 2006 when the 2006 QDR emphasized the need and ability of prompt global strike "to attack fixed, hard and deeply buried, mobile and relocatable targets with improved accuracy anywhere in the world promptly upon the President's order."[685] The need for the prompt global strike was

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[680] Ian Williams, "More Than Missiles: China Previews its New Way of War," *CSIS Brief*, October 16, 2019, accessed July 29, 2021, https://www.csis.org/analysis/more-missiles-china-previews-its-new-way-war

[681] U.S. Department of Defense, *Quadrennial Defense Review Report*, Washington, DC, September 30, 2001, 43, accessed January 11, 2020, http://www.comw.org/qdr/qdr2001.pdf

[682] "Conventional Prompt Global Strike and Long-Range Ballistic Missiles: Background and Issues," *CRS*, July 16, 2021, accessed July 29, 2021, https://fas.org/sgp/crs/nuke/R41464.pdf

[683] Ibid, 7

[684] U.S. Department of Defense, *2004 National Military Strategy*, accessed March 31, 2021, https://archive.defense.gov/news/Mar2005/d20050318nms.pdf

[685] U.S. Department of Defense, *Quadrennial Defense Review Report*, Washington, DC, February 6, 2006, 49-50, accessed January 11, 2020, http://www.globalsecurity.org/military/library/policy/dod/qdr-2006-report.pdf

emphasized in the 2006 US Quadrennial Defense Review (QDR).[686] In the same year, 2006, China began fielding DF-31 – a road-mobile ICBM with a 7,000-8,000km range.[687] Then, in 2007, China fielded DF-31A, a variant of DF-31, with an enhanced range of 11,000km.[688] These developments in China's nuclear force modernization led the US to continue to advance its CPS capabilities. The 2010 QDR, while dwelling upon the significance of the global strike, notes that it could be a solution to "growing threats to forward-deployed forces and bases and ensuring U.S. power projection capabilities."[689] In this regard, in 2003, the US Air Force and the Defense Advanced Research Projects Agency (DARPA) launched a program to develop "a launch vehicle similar to a ballistic missile and a hypersonic re-entry vehicle, known as the common aero vehicle (CAV)" that would provide the US ability to conduct prompt global strikes.[690] Similarly, US Air Force specified that it could "modify both Minuteman II missiles and Peacekeeper missiles to carry conventional warheads."[691] DARPA also sought to design ArcLight, an alternative delivery vehicle for the CPS mission.[692]

The 2010 *Nuclear Posture Review* also viewed CPS to be in line with US regional deterrence strategy, noting "these capabilities may be particularly valuable for the defeat of time-urgent regional threats."[693] Though the review mentions the intention not to affect "the stability of our nuclear relationships with Russia or China," the underlying impact of CPS capability on the US first strike against Chinese nuclear command and control and limited nuclear forces could be devastating, leaving China with no command infrastructure to launch a retaliatory strike or wage a nuclear war, even if left with a few warheads.[694]

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[686] "Conventional Prompt Global Strike and Long-Range Ballistic Missiles: Background and Issues," *CRS*, Updated July 16, 2021, accessed February 21, 2022, https://sgp.fas.org/crs/nuke/R41464.pdf
[687] "Missile Defense Project, DF-31 (Dong Feng-31 / CSS-10)," *Missile Threat, Center for Strategic and International Studies*, August 12, 2016, last modified August 9, 2021, accessed December 28, 2021, https://missilethreat.csis.org/missile/df-31/.
[688] Ibid
[689] "U.S. Department of Defense," *Quadrennial Defense Review Report*, Washington, DC, February 2010, 32-33, accessed January 11, 2020, http://archive.defense.gov/qdr/QDR%20as%20of%2029JAN10%201600.pdf
[690] "Conventional Prompt Global Strike," *CRS*, 11
[691] Ibid
[692] Ibid
[693] "U.S. Department of Defense," *Nuclear Posture Review*, Washington, DC, April 6, 2010, 34, accessed January 11, 2020, https://dod.defense.gov/Portals/1/features/defenseReviews/NPR/2010_Nuclear_Posture_Review_Report.pdf
[694] Ibid

The Pentagon continues research to develop "a hypersonic glide vehicle [HGV], now known as the Common Hypersonic Glide Body," which could be used for conventional prompt long-range strikes. According to the *CRS Report*, the HGV "is likely to be deployed on intermediate-range missiles on Navy submarines, for what is now known as the Prompt Strike Mission."[695] In FY2020, the Pentagon received $521 million for the Navy's CPS program, and for FY2021 requested $1.1 billion; however, the US Congress appropriated $766.6 million. For FY2022, a request of $1.4 billion was made for FY2022. The funding will be used to research and develop systems required to deploy the CPS system on Vargina-class attack submarines by 2028 and Zumwalt-class destroyers by 2025.[696] Congress has increased the funding by $125 million.[697] The growing funding shows the Pentagon and Congress's priority on CPS, moving toward deployments.

The CPS development programs have intensified China's threat perception. Arguably, it increased strategic instability and exacerbated the security dilemma between the US and China as Yao Yunzhu, former Major General of the PLA, wrote in 2013, "the United States is developing a series of conventional strategic strike capabilities. Once deployed, they could have the capability to strike China's nuclear arsenal and make China's NFU policy redundant."[698] Some Chinese experts suggest the US might conclude that China will not respond to conventional strikes against its nuclear installations, thus encouraging the US to do so in a future crisis (or, perhaps, to pre-empt China's rise at an opportune moment). To them, this weakens China's nuclear deterrent.[699] Also, US congressional reports, to Chinese analysts, include descriptions of targets, such as "deeply buried" and "hardened" or "fleeting targets" and "time-critical" targets, that clearly fit the characteristics of Chinese missile sites and command and control facilities.[700]

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[695] "Conventional Prompt Global Strike and Long-Range Ballistic Missiles: Background and Issues," *CRS*, Updated July 16, 2021, accessed December 28, 2021, https://sgp.fas.org/crs/nuke/R41464.pdf
[696] Wes Rumbaugh, and Tom Karako, "Seeking Alignment: Missile Defense and Defeat in the 2022 Budget," *CSIS*, December 10, 2021, accessed December 28, 2021, https://www.csis.org/analysis/seeking-alignment-missile-defense-and-defeat-2022-budget; Ibid
[697] Rumbaugh and Karako, "Seeking Alignment: Missile Defense and Defeat in the 2022 Budget"
[698] Yao Yunzhu, "China Will Not Change Its Nuclear Policy," *China-U.S. Focus*, April 22, 2013, accessed May 18, 2021, http://www.chinausfocus.com/peace-security/china-will-not-change-its-no-first-use-policy; also see *Congressional Research Service*, "Conventional Prompt Global Strike and Long-Range Ballistic Missiles: Background and Issues," Updated December 16, 2020, accessed May 18, 2021, https://fas.org/sgp/crs/nuke/R41464.pdf
[699] Cunningham and Fravel, *Assuring Assured Retaliation*, 20-22, 44
[700] Ibid

China's evolving ASAT and A2/AD capabilities are a major concern in the official US discourse.[701] CPS could have a crucial role in the emerging US military strategies by striking deep inside the adversary's territory to breakthrough A2/AD capabilities and could be used to threaten critical non-strategic infrastructure and targets in China.[702] The CPS capability could theoretically, give the US an edge to target China's nuclear forces without resorting to a nuclear first strike, as the Obama administration's National Defense Authorization Act (NDAA) of 2013 requested the Commander of US Strategic Command to review US capabilities to "neutralize" underground tunnels using "conventional and nuclear forces."[703]

The pre-emptive use of nuclear weapons against an imminent attack for escalation control has always been an option for the US. Yet, for several reasons, such as the increasing awareness of the impact of nuclear war and available alternative means such as CPS, the first use by the US of nuclear weapons is seemingly politically infeasible, albeit not impossible in extremis.[704] Therefore, CPS appears to be a better alternative to a nuclear first strike and a viable option for US policymakers to disarm, disrupt and destroy Chinese assets if necessary. CPS weapons would add value to America's existing nuclear capabilities as US officials have argued that such weaponry could provide niche capabilities, allowing the US to strike nuclear targets with conventional missiles in a short time.[705] However, the prospects of such a scenario may motivate China to reconsider its security and nuclear policies, such as giving up its NFU policy in the future and expanding its number arsenal, as discussed in detail in Chapter Five.

Using a neoclassical lens, the US is the most important external factor that has shaped China's threat perception and potentially induced change in domestic security policies by influencing China's internal factors – it is more important than Russia and India. For instance, the US pivot to Asia announced in 2011 made China feel vulnerable to the US

[701] "Conventional Prompt Global Strike and Long-Range Ballistic Missiles: Background and Issues," *Congressional Research Service, R41464*, Updated August 14, 2019, accessed January 11, 2020, https://assets.documentcloud.org/documents/6271735/Conventional-Prompt-Global-Strike-and-Long-Range.pdf
[702] Ibid, 4
[703] "National Defense Authorization Act For Fiscal Year 2013," *Public Law* 112–239—January 2, 2013, accessed May 19, 2021, https://www.congress.gov/112/plaws/publ239/PLAW-112publ239.pdf
[704] Tong Zhao, *Conventional Counterforce Strike and Damage Limitation*, Sam Nunn School of International Affairs, Georgia Tech, https://igcc.ucsd.edu/_files/PPNT/NuclearBriefing2presentation1.pdf; Aaron Mehta, "Three Thoughts on Hypersonic Weapons from the Pentagon's Technology Chief," *Defense News*, July 17, 2018, accessed December 28, 2021, https://www.defensenews.com/air/2018/07/16/3-thoughts-on-hypersonic-weapons-from-the-pentagons-technology-chief/
[705] "Conventional Prompt Global Strike and Long-Range Ballistic Missiles: Background and Issues," 36

and generated a series of responses from inside China. China's comprehensive military modernization, led by President Xi announced in late 2015, was the reactive manifestation of China's changing threat perception. The 2018 NPR could be considered a US response to Xi's response. Such measures from both sides exacerbate the security dilemma between both states and the Indo-Pacific region and undermine political relations and strategic security.

3.4 Conclusion

This chapter has examined China's nuclear threat perception. It argues that Russia is viewed as posing a low level threat in China's nuclear threat perception, which means Russia has relatively benign intent. Though it has a high capability, operational, and strategic nuclear triad, it is unlikely that Russia will be involved in a conflict involving nuclear weapons against China. This is because both states lack any severe clash of interests and share a common adversary (the US) and their political and military relations have continued to improve in recent years. Moreover, Russia has assisted China in advancing its nuclear modernization and continues to sell China state-of-the-art strategic weaponry, such as the S-400 BMD system and SU-30 aircraft. Given such strategic and economic interdependence (discussed above), China's nuclear threat perception of Russia is low.

India has a medium level capability, as it lacks the operational, strategic nuclear triad. However, it could engage China in a nuclear conflict, given that its ICBM forces are expanding and its SSBN force is maturing gradually. China's nuclear weapons inventory is more than double the size of India's nuclear weapons inventory, the difference is not huge when compared to the US. Such a parity against China gives India a medium-level intent, wherein the use of nuclear weapons depends upon how conflict evolves and escalates. The recent Chinese deployment of a strategic bomber in the region close to the Indian border and India's ongoing development of the S-400 anti-missile and anti-air defense BMD system suggest an unstable relationship, where the intent of both is not benign.

The US has a diverse and sophisticated nuclear capability that can out right challenge China's nuclear force and potentially eliminate its ability to deliver a second strike against the US in response to a US first strike. The 2018 NPR also rejects NFU, suggesting from China's point of view hostile intent from the US in which it might use nuclear weapons

first in a conflict. In other words, the US nuclear triad and ongoing technological developments are perceived in Beijing as undermining China's deterrent, and necessitating a response, which is explored in Chapter Six.

In terms of China's external drivers of change, the chapter deduces that the changes in the US and India's nuclear weapons policy are likely to breed change in the nuclear weapons policy and force structure of China, generating a spiral of action-reaction and leading to more changes in the security policies of China's adversaries. Chapters Six and Eight explore this spiral in detail. According to the latest 2018 NPR, the US maintains that it preserves the option of a pre-emptive nuclear weapons strike in "the most extreme circumstances to protect our vital interests and those of our allies."[706] This kind of strategy, coupled with the capability to carry out a first strike against China and the ongoing deterioration of US-China political relations, results in the US being the highest threat in China's threat perception. The 2013 Science of Military Strategy, China's military strategy book, notes that,

> The US is implementing [a] routine called the 'Fast Global Strike' program, and once formed into actual combat capability, will carry nuclear missile power implementing conventional strikes will put us in a passive position, greatly affecting our nuclear counterattack ability and weakening our nuclear deterrence effectiveness.[707]

China's current nuclear force modernization is spurred mainly by the perception that China's adversaries are advancing towards a more hostile and capable nuclear weapons policy and advancing nuclear and conventional military capabilities. As the external factors intensify threat perception and manifest across China's periphery, the pressure increases on China to adopt countermeasures. Apart from external drivers of change, mutually reinforcing internal factors also induce changes in China's nuclear weapons force modernization as identified by neoclassical realism. The following chapter examines and identifies these internal factors of change.

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[706] *US Nuclear Posture Review 2018*, 2, accessed January 25, 2020, https://media.defense.gov/2018/Feb/02/2001872886/-1/-1/1/2018-NUCLEAR-POSTURE-REVIEW-FINAL-REPORT.PDF

[707] The English translation in this book is not perfect and may confuse the reader. The translator (Luis Ayala) has also acknowledged this in the "publisher foreword" of the translated book, obtained by the library of the University of Waikato, also available online for sale on Amazon.com. *The Science of Military Strategy*, 171

Chapter Four

China's Nuclear Weapons Force Modernization: Internal Drivers of Change

4.1 Introduction

In addition to the external factors identified in the previous chapters, neoclassical realism holds that internal factors also play an important, yet often overlooked, role in state calculations, and this chapter uses this framework to show how they influence China's military and nuclear weapons force modernization. It is imperative to explore internal factors driving the modernization because these factors and external factors will help this scholarship consider the future trajectory of China's nuclear weapons force modernization.

The chapter investigates how Beijing's decades-long economic development provides a base for China's nuclear weapons force modernization. Then it considers the role of emerging nuclear constituencies in the different services of the PLA. Subsequently, the role of the individual as the head of state and, in this case, President Xi's role in China's nuclear weapons force modernization, is outlined. The chapter concludes that internal factors play a very important role in China's nuclear force modernization; however, the external factors remain the primary driver of change. Among other domestic factors, President Xi plays a noteworthy role. He has introduced massive reforms, particularly in the domain of the nuclear weapons force; the recently discovered construction of hundreds of missile silos suggests a nuclear buildup is in the offing. This latest major shift by president Xi in the nuclear domain is discussed in Chapter Six.

4.2 Internal Factors

Scholars identify several internal factors as affecting a state's decision to go nuclear. [708] Likewise, the force modernization process is also an outcome of multiple and overlapping internal factors. Internal factors that explain China's vertical nuclear proliferation include its economic development, emerging bureaucratic competition between different organizations of the PLA for the greater nuclear role, prestige and status drivers, and the

[708] Sagan and Waltz, *The Spread of Nuclear Weapons*; Epstein, *Why States Go*; Sagan, "Why Do States Build Nuclear Weapons"; Cirincione, *Bomb Scare*; Beckley, "Economic Development and Military Effectiveness"

role of important individuals, in this case, the role of President Xi in China's nuclear weapons force modernization. These internal factors are examined below.

4.2.1 Economic Development

Like other great powers, China has utilized its increasing economic resources to expand and modernize its armed forces and extend its geopolitical influence. But this assertion did not begin immediately. After the 1979 reforms, China had an economic growth of 8.6 percent from 1979 to 1989. However, it did not immediately begin to modernize its military. While its economy was still tiny (China had a GDP of over $347 billion in 1989), China adopted a restrained foreign policy that did not seeming to require modernized armed forces.[709] Minxin Pei writes that,

> Deng Xiaoping explicitly warned against such expansion in the early 1980s because it could prematurely attract the strategic attention of the West and trigger major power rivalry that might distract China from its economic modernization and even endanger its strategy of taking advantage of a relatively peaceful international environment to focus on economic development.[710]

Things began to change in the late 1980s because of internal and external factors, which forced China to adopt a more active foreign policy.[711] These developments brought opportunities and challenges for China. It began to assume a larger geopolitical role, further opened up its economy, and initiated a systematic military modernization plan.

The first challenge emerged from inside, in the shape of the Tiananmen Square incident in 1989, and this, in turn, generated a response from outside as sanctions by the US and the West were placed on China in the wake of the crackdown.[712] The US House of Representatives, in July 1989, sanctioned China for human rights violations, banning and, in some cases restricting, "arms sales, crime control equipment, and technology transfers,

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[709] "GDP (current US$) - China, United States," *The World Bank*, accessed December 29, 2021, https://data.worldbank.org/indicator/NY.GDP.MKTP.CD?locations=CN-US; Iman Ghosh, "The People's Republic of China: 70 Years of Economic History," *Visual Capitalist*, October 12, 2019, accessed December 29, 2021, https://www.visualcapitalist.com/china-economic-growth-history/

[710] Minxin Pei, "Assertive Pragmatism: China's Economic Rise and its Impact on Chinese Foreign Policy," *French Institute of International Relations*, *Proliferation Papers*, Fall 2006, https://www.ifri.org/sites/default/files/atoms/files/Prolif_Paper_Minxin_Pei.pdf

[711] Ibid

[712] David Skidmore and William Gates, "After Tiananmen: The Struggle over U.S. Policy toward China in the Bush Administration," *Presidential Studies Quarterly*, Vol. 27, No. 3, (1997); "The Presidency in the World," 522; Melinda Liu, "30 Years After Tiananmen: How the West Still Gets China Wrong," *Foreign Policy*, June 4, 2019, accessed February 4m 2021, https://foreignpolicy.com/2019/06/04/30-years-after-tiananmen-how-the-west-still-gets-china-wrong/

and shifted the U.S. government's stance to restrict loans to China by international financial institutions."[713]

The EU also placed an arms embargo on China on June 27, 1989, following the incident. It included "the suspension of military cooperation and high-level contacts, reduction of cultural, scientific and technical cooperation programs, and the prolongation of visas to Chinese students."[714] The sanctions from the US and the West pushed China to pursue a more active and broader foreign policy, reaching out to the developing world for partners to overcome diplomatic isolation and economic sanctions.[715] The criticism and sanctions also resonated with China's experience during the "Century of Humiliation" from 1942-1949 at the hands of Western and Asian imperialist forces, reinforcing China's suspicion of the US and its allies, and that they wanted to end the rule of the Chinese Communist Party in China.[716]

The second challenge was a result of the end of the Cold War. Before its termination, China was considered to be strategically important to the US as a competitor against the Soviet Union.[717] However, with the collapse of the Soviet Union, a rising communist China was no longer viewed as a significant partner, but rather a new potential challenger in Washington. In 1996, China-Taiwan relations deteriorated, following Taiwanese President Lee Teng-hui's visit to the US in 1995. President Bill Clinton invited President Lee to the US after withdrawing from a fifteen-year-old US policy against granting visas to Taiwan's leaders.[718] After the visit, China-Taiwan relations became so tense that in March 1996, China deployed 150,000 troops in Fujian, a province bordering the Taiwan Strait, and conducted large-scale military exercises.[719] This led to US involvement, sending two aircraft carrier battle groups to the Taiwan Strait, though they stayed out of

[713] Richard C. Bush, "30 Years After Tiananmen Square, A Look Back on Congress' Forceful Response," *Brookings*, May 29, 2019, accessed August 1, 2021, https://www.brookings.edu/blog/order-from-chaos/2019/05/29/30-years-after-tiananmen-square-a-look-back-on-congress-forceful-response/
[714] Kristin Archick, Richard F. Grimmett and Shirley Kan, "European Union's Arms Embargo on China: Implications and Options for U.S. Policy," *CRS*, April 15, 2005, accessed August 1, 2021, https://www.everycrsreport.com/files/20050415_RL32870_91cfea05d1076d12c778cd91a6c080bcbf9c3e25.pdf
[715] Ibid
[716] Pamela Kyle Crossley, "Xi's China is Steamrolling its Own History," *Foreign Policy*, January 29, 2019, accessed May 19, 2021, https://foreignpolicy.com/2019/01/29/xis-china-is-steamrolling-its-own-history/
[717] Skidmore and Gates, "After Tiananmen," 521-522
[718] "Timeline: U.S. Relations With China 1949–2021," *CFR*, accessed December 30, 2021, https://www.cfr.org/timeline/us-relations-china
[719] Chen Qimao, "The Taiwan Strait Crisis: Its Crux and Solutions," *Asian Survey*, Vol. 36, No. 11 (1996), 1055-1066

the strait.[720] Later, in 1999, China-US relations deteriorated again when NATO accidentally bombed the Chinese embassy in Belgrade, Serbia.[721] The bombing sparked protests from Chinese across the globe, primarily in the US and EU, who regarded it as indicative of NATO's fascism.[722] Officially, China's government viewed it as "a gross violation of Chinese sovereignty and a random violation of the Vienna Conventions on Diplomatic Relations and the norms of international relations," and demanded a public apology.[723]

The changing nature of relations made the Chinese leadership conscious of the fluid nature of international relations and the importance of self-help. China, which observed the US military primacy in the First Gulf War, was apprehensive. The overwhelming and swift success of the US because of its high-tech military systems made China worry about any future contingency involving the US.[724] Additionally, the US was building a more powerful allied system in the region by strengthening its ties with South Korea, Japan, and Taiwan, further deepening China's concerns.[725]

Despite the ebbs and flows in the relationship, the US-China bilateral trade grew from $2.37 billion in 1979 to $33.15 billion in 1992.[726] From 1993 to 2001, bilateral trade further increased from $40.30 billion to $121.52 billion. During the Bush Jr. administration, the US began to pursue a policy of re-engagement with China amidst the War on Terror.[727] Barack Obama's administration pursued a hedging policy, cooperating

[720] Qimao, "The Taiwan Strait Crisis," 1055
[721] "Timeline: U.S. Relations With China 1949–2021," *CFR*, accessed December 30, 2021, https://www.cfr.org/timeline/us-relations-china
[722] Peter Hays Gries, "Tears of Rage: Chinese Nationalist Reactions to the Belgrade Embassy Bombing," *The China Journal* No. 46 (July, 2001), 25-43
[723] Dexin Tian, "U.S. and NATO Apologies for the Chinese Embassy Bombing: A Categorical Analysis," *International Journal of Communication*, No. 1 (2007), 360-376
[724] "The Gulf War-Lessons for Chinese Military S&T: A report from U.S. Embassy Beijing November 1996," *FAS*, accessed February 4, 2021, https://fas.org/nuke/guide/china/doctrine/stmil14.htm
[725] John Hemmings, "The Evolution of the U.S. Alliance System in the Indo-Pacific Since the Cold War's End" in Alexander L. Vuving ed. *Thinking About Security in the Indo-Pacific*, Daniel K. Inouye Asia-Pacific Center for Security Studies, 2020, 145-160, https://www.jstor.org/stable/pdf/resrep26667.14.pdf?refreqid=excelsior%3A53b53a9b78fb2074ef6b6525f4b86f30
[726] "Trade in Goods with China, Foreign Trade," *United States Census Bureau*, https://www.census.gov/foreign-trade/balance/c5700.html#1992
[727] Yeong-Kuang Ger, "From Congagement to Engagement: The Changing American China Policy and Its Impact on Regional Security," *American Journal of Chinese Studies*, Vol. 11, No. 2, (2004), 159-180; Kenneth G. Lieberthal, "U.S. Policy Toward China," *Brookings*, March 1, 2001, accessed August 1, 2021, https://www.brookings.edu/research/u-s-policy-toward-china/; Thomas J. Christensen, "Shaping the Choices of a Rising China: Recent Lessons for the Obama Administration," *The Washington Quarterly*, Vol. 32, No. 3, (Winter 2000), 89-104

economically and competing militarily with China.[728] As a result, the trade from 2002 to 2016 increased from $147.31 billion to $578.01 billion.[729] The US accelerated competition with China during the Trump administration, including by launching a trade war against Beijing. The bilateral trade from 2017 to 2020 decreased from $635.16 billion to $559.22 billion.[730]

On the military side and concomitant to its engagement and hedging policy towards China, the US continued its commitment to providing some support to Taiwan's defense. From 1979 to 1992, the US made $6.23 billion worth of arms sales to Taiwan.[731] The arms sale increased to $11.90 between 1993 and 2001.[732] From 2001 to 2020, the US made $5.91 billion worth of arms sales to Taiwan.[733] On the diplomatic front as well, the US has offered unwavering support for Taiwan. The Trump administration and now the Biden administration have publically claimed the US security commitment to Taiwan remains intact (discussed in detail in Chapter Six).[734]

The Tiananmen Square incident, the collapse of the Soviet Union, the First Gulf War, and subsequent up and downs in the US-China relationship through the War on Terror, and Trump and Biden administrations reinforced and sustained the perception in Beijing that China needed to pursue its economic development and rapidly modernize its military. From 1979 to 2018, China's real gross domestic product (GDP) grew at an average of 9.5

[728] Mayang A. Rahawestri, "Obama's Foreign Policy in Asia: More Continuity than Change," *Security Challenges*, Vol. 6, No. 1, (2010), 109-120; James Kitfield, "Is Obama's 'Pivot to Asia' Really a Hedge Against China?" *The Atlantic*, June 9, 2012, accessed August 2, 2021, https://www.theatlantic.com/international/archive/2012/06/is-obamas-pivot-to-asia-really-a-hedge-against-china/258279/, Yang Wenjing, "Three Features of Obama's Foreign Policy and Their Implications for China," *China and US Focus*, October 27, 2016, accessed August 2, 2021, https://www.chinausfocus.com/foreign-policy/three-features-of-obamas-foreign-policy-and-their-implications-for-china; Robert Sutter, "The Obama Administration and China: Positive but Fragile Equilibrium," *Asian Perspective*, Vol. 33, No. 3, (2009), 81-106; David Barboza and Jeffrey A. Bader, "Obama's past and Biden's future with China," *Brookings*, December 20, 2020, accessed August 2, 2021, https://www.brookings.edu/on-the-record/obamas-past-and-bidens-future-with-china/

[729] Ibid

[730] Ibid

[731] SIPRI-Importer/Exporter Tiv Tables, accessed November 15, 2021, https://armstrade.sipri.org/armstrade/page/values.php

[732] Ibid

[733] Ibid

[734] Derek Grossman, "Biden Administration shows Unwavering Support for Taiwan," *The RAND Blog*, October 20, 2021, accessed December 31, 2021, https://www.rand.org/blog/2021/10/biden-administration-shows-unwavering-support-for-taiwan.html; Jenny Leonard and Josh Wingrove, "Biden Says U.S. would defend Taiwan from Attack by China," *Bloomberg*, October 22, 2021, accessed December 31, 2021, https://www.bloomberg.com/news/articles/2021-10-22/biden-says-the-u-s-would-defend-taiwan-from-attack-by-china

percent annually.[735] According to the World Bank, China's GDP was $383.4 billion in 1991, and, at that time, its defense budget, according to SIPRI, was $20.13 billion.[736] By 2019, its GDP had increased to $14.32 trillion, and its defense budget reached $266.44 billion.[737] However, according to more recent SIPRI estimates, China's defense budget was $240 billion in 2019, less than previous SIPRI estimates but still higher than China's official defense budget.[738] This suggests some uncertainly over what, precisely, China's military budget is. By 2020, its GDP had increased to $14.72 trillion, and its defense budget reached $252 billion.[739] Table 8 below shows that the defense budget of China and the US has increased over time with the increase in their respective GDP.

Table 8. China-US GDP and Defense Budget growth 1991-2020

Country	GDP 1991; USD (billions)	Defense budget, 1991; USD (billions)	GDP 2020; USD (billions)[740]	Defense budget 2020; USD (billions)[741]
China	383.4	23.3	14720	252.0
US	2396.7	551.9	20930	766.5

As far as China's spending on its nuclear weapons program is concerned, China has roughly 350 nuclear warheads as of November 2021, and more are in production.[742] It maintains and modernizes a diverse nuclear weapons delivery platform based on land, air,

[735] "China's Economic Rise: History, Trends, Challenges, and Implications for the United States," *Congressional Research Service*, Updated June 25, 2019, accessed February 4, 2021, https://fas.org/sgp/crs/row/RL33534.pdf

[736] "Military expenditure (% of GDP) – China," The *World Bank*, accessed January 14, 2021, https://data.worldbank.org/indicator/MS.MIL.XPND.GD.ZS?locations=CN; "China," *The World Bank*, accessed January 14, 2021, https://data.worldbank.org/country/china; Military expenditure by country, in constant (2018) US$ m., 1988-2019, accessed January 24, 2021, https://www.sipri.org/sites/default/files/Data%20for%20all%20countries%20from%201988%E2%80%932019%20in%20constant%20%282018%29%20USD.pdf

[737] Ibid

[738] Nan Tian and Fei Su, "A New Estimate Of China's Military Expenditure," *SIPRI*, January 2021, accessed January 24, 2021, https://sipri.org/sites/default/files/2021-01/2101_sipri_report_a_new_estimate_of_chinas_military_expenditure.pdf

[739] Ibid

[740] "Gross domestic product 2020, World Development Indicators database," *World Bank*, July 1, 2021, accessed August 2, 2021, https://databank.worldbank.org/data/download/GDP.pdf

[741] "World military spending rises to almost $2 trillion in 2020," *SIPRI*, April 26, 2021, accessed December 31, 2021, https://www.sipri.org/media/press-release/2021/world-military-spending-rises-almost-2-trillion-2020

[742] Hans M. Kristensen and Matt Korda, "Nuclear Notebook: Chinese nuclear forces, 2021," *BAS*, November 15, 2021, accessed December 31, 2021, https://thebulletin.org/premium/2021-11/nuclear-notebook-chinese-nuclear-forces-2021/; Office of the Secretary of Defense, "Military and Security Developments Involving the People's Republic of China 2021," *Annual Report to Congress*, accessed December 31, 2021, https://media.defense.gov/2021/Nov/03/2002885874/-1/-1/0/2021-CMPR-FINAL.PDF

and sea components.[743] China's spending on its nuclear weapons program is more opaque than its overall defense spending. There exists no reliable official information via open-source material on Chinese nuclear spending. However, there are some estimates from various non-Chinese organizations. According to a June 2021 report by the International Campaign to Abolish Nuclear Weapons (ICAN), China spent an estimated 4 percent of its total military budget on nuclear weapons in 2020, approximately $10.1 billion.[744] The US spent 37.4 billion on nuclear weapons in 2020, roughly 5 percent of its total defense budget. India spent $2.4 billion, approximately 3 percent of its total military spending, and Russia spent $8 billion on nuclear weapons in 2020.[745] Another report by the *Women's International League for Peace and Freedom* claims that China spent 5 percent of its total annual military budget on its nuclear weapons program in 2016, which was $8.7 billion.[746] According to a 2004 study by Vijai K. Nair, China spent 5 percent of its total defense budget on nuclear weapons in 2004.[747]

Table 9. China's Estimated Spending on Nuclear Weapons[748]

Year	% of Total Defense Spending on Nuclear Weapons	Total Defense Spending USD (billions)	Spending on Nuclear Weapons USD (billions)
2004	5	66.83	3.34
2016	5	203.94	8.70
2020	4	252.00	10.1
2031	4 (this projection assumes China is planning to double defense spending in the next decade (2022-2031) as it did from 2012-2021.	500 (estimated)	20 (estimated)

[743] Ibid
[744] "Complicit: 2020 Global Nuclear Weapons Spending," *International Campaign to Abolish Nuclear Weapons (ICAN)* June 2021, accessed December 31, 2021, https://d3n8a8pro7vhmx.cloudfront.net/ican/pages/2161/attachments/original/1622825593/Spending_Report_Web.pdf?1622825593
[745] Ibid
[746] Ray Acheson et al., "Assuring Destruction Forever: 2019 Edition," *Women's International League for Peace and Freedom*, April 2019, accessed February 4, 2021, https://reachingcriticalwill.org/images/documents/Publications/modernization/assuring-destruction-forever-2019.pdf
[747] Vijai K. Nair, "China's Nuclear Strategy and Its Implications For Asian Security," *China Brief*, Vol. 4, Issue. 3, http://www.jamestown.org/single/?no_cache=1&tx_ttnews%5Btt_news%5D=26259. Nair's astute insight was also quoted in James Rickard, "Sun Tzu, Nuclear Weapons and China's Grand Strategy," *Strategic Insights*, Vol. VII, No 3, (2008) http://www.nps.edu/Academics/centers/ccc/publications/OnlineJournal/2008/Jul/rickardJul08.html
[748] SIPRI, "SIPRI Military Expenditure Database"; Office of the Secretary of Defense, "Military and Security Developments Involving the People's Republic of China 2021," 142

The steady modernization of China's nuclear weapons program, evident from the periods noted above of FY 2004, 2016, and 2020 suggests a pattern of incremental increases in the nuclear weapons budget in proportion to annual increases in the defense budget. However, the consistent 4-5 percent of defense spending may not be enough given the quantitative increase in the number of Chinese nuclear weapons, notably the DF-41 and JL-3 (JL-3 is in an advanced stage of development, expected to be operational in 2025), both capable of MIRVing.[749]

China is also building newly discovered nuclear missile silo fields, which it appeared to have tried to keep hidden from the world. So far, three silo fields have been discovered. The first field was discovered in June 2021, the second in July 2021, and the third in August 2021. All three fields were in different stages of construction.[750] The US was taken entirely by surprise as the US DoD 2020 annual report on China noted that the Chinese estimated nuclear stockpiles are in the low 200s and would double in size over the next decade.[751] The 2021 annual report on China to Congress revisited its estimates. Being cautious of more discoveries and without estimating the number of new silos under construction, the report notes the recent surge in the construction of silos could lead China to deploy hundreds of new ICBMs.[752] According to *Arms Control Today*, China is constructing at least 250 silos at the three different silo fields. In contrast, the *Bulletin of Atomic Scientists* suggests that more than 300 silos are under construction.[753] Such an exponential increase in silos would require new ICBMs and nuclear payloads, necessitating a sharp increase in the number of ICBMs, nuclear weapons, and new miniature nuclear warheads to have compatibility with new MIRVed missiles. For instance, the recently MIVRed DF-5B and the DF-5C can carry three and ten warheads, respectively, and China, therefore, requires more warheads for them.[754] China is, therefore, on the cusp of a sizeable silo-based ICBM force expansion.

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[749] Kristensen and Korda, "Nuclear Notebook: Chinese nuclear forces," 2021

[750] Kristensen and Korda, "China's Nuclear Missile Silo Expansion: From Minimum Deterrence to Medium Deterrence,"

[751] Office of the Secretary of Defense, "Annual Report to Congress, Military and Security Developments Involving the People's Republic of China 2020," accessed January 1, 2022, Annual Report to Congress

[752] Office of the Secretary of Defense, "Military and Security Developments Involving the People's Republic of China 2021," 142

[753] Ibid; Shannon Bugos and Julia Masterson, "New Chinese Missile Silo Fields Discovered," *Arms Control Today*, September 2021, accessed December 31, 2021, https://www.armscontrol.org/act/2021-09/news/new-chinese-missile-silo-fields-discovered

[754] Ian Williams, "More Than Missiles: China Previews its New Way of War," *CISS Brief*, October 16, 2019, accessed February 4, 2021, https://www.csis.org/analysis/more-missiles-china-previews-its-new-way-war;

Similarly, the DF-41 can carry up to 10 warheads.[755] The SLBM JL-2 can carry between 3-8 warheads, and the PLAN has 72 launchers.[756] The next-generation SLBM, the JL-3, is also capable of MIRVing, and there is speculation that it can carry up to 10 warheads.[757] To equip all these delivery platforms with nuclear warheads, the PLA requires a significant increase in the size of its nuclear arsenal and warhead miniaturization. This presumably will necessitate a large increase in nuclear spending.

After discovering the new silo fields, the US DoD, in a 2021 annual report to the US congress, maintains that the "accelerating pace of the PRC's nuclear expansion may enable the PRC to have up to 700 deliverable nuclear warheads by 2027. The PRC likely intends to have at least 1,000 warheads by 2030."[758] The maintenance of the existing stockpile, replacing aging warheads, and ensuring the safety and security of the nuclear program is another area that requires significant budgetary allocations. Assuming the DoD report is accurate as it pertains to the projected increase in the size of the number of nuclear warheads by China, budgetary allocations for China's nuclear weapons program will need to double by 2027 (700 warheads – double the existing size of 350) and triple by 2030 (1,000 warheads), which will bring it to an estimated eight percent by 2027 and 12 percent by 2030 of the total defense budget.[759]

According to Matt Korda and Hans Kristensen's recent analysis on the newly discovered silo fields, if China loads 300 silos with the DF-41 MIRVed with three warheads (DF-41 can carry 3-10 warheads; for conservative analysis, the study would consider three warheads per ICBM), then China's set of ICBMs would be able to carry more than 900 warheads in total. The 300 silos, once operational, would add 900 warheads to the existing

[755] "Missile Defense Project, DF-41 (Dong Feng-41 / CSS-X-20), Missile Threat," *Center for Strategic and International Studies*, August 12, 2016, last modified July 31, 2021, accessed December 31, 2021, https://missilethreat.csis.org/missile/df-41/

[756] "Missile Defense Project, JL-2, Missile Threat," *Center for Strategic and International Studies*, August 12, 2016, last modified July 31, 2021, accessed December 31, 2021, https://missilethreat.csis.org/missile/jl-2/; Kristensen and Korda, "Nuclear Notebook: Chinese nuclear forces, 2021,"

[757] Prepared Statement of Hans M. Kristensen Director, "Nuclear Information project Federation of American Scientists before the U.S.-China Economic and Security Review Commission Hearing On China's Nuclear Forces," accessed August 3, 2021, https://www.uscc.gov/sites/default/files/2021-06/Hans_Kristensen_Testimony.pdf

[758] Office of the Secretary of Defense, "Military and Security Developments Involving the People's Republic of China 2021," *Annual Report to Congress*, accessed December 31, 2021, https://media.defense.gov/2021/Nov/03/2002885874/-1/-1/0/2021-CMPR-FINAL.PDF

[759] Office of the Secretary of Defense, "Military and Security Developments Involving the People's Republic of China 2021"; Bruce G. Blair and Matthew A. Brown, "World Spending on Nuclear Weapons Surpasses $1 Trillion Per Decade, Global Zero Technical Report Nuclear Weapons Cost Study," *Global Zero*, June 2011, accessed February 5, 2021, https://www.globalzero.org/wp-content/uploads/2020/01/GZ-Weapons-Cost-Global-Study.pdf

nuclear stockpile of 350, leading to a total of 1,250. A non-conservative worst-case scenario would suggest that China would arm every DF-41 with ten warheads, leading to potentially 3000 warheads for its silos-based ICBMs.

Currently, the silo fields discovered are under construction, and it is not known how many more fields exist. It is also unknown how many silos will be loaded as it could simply be a 'shell game,' making it difficult for adversaries to strike actual silos with a missile. A shell game is a strategy of maintaining a large number of siloed nuclear weapons in remote and sparsely populated areas to compel an adversary to expend a large number of its nuclear weapons to destroy them, leaving few warheads in the arsenal to target counter force and value targets.[760] Moreover, it is not known how many of the missiles will be MIRVed with how many warheads. However, despite these unknown factors, the sheer number of silos significantly impacts US strategic planning. The 2021 DoD report on China, while analyzing the new silos construction, notes, "[with] the PRC's past concerns about silo survivability and ongoing strategic early warning progression, these new silos provide further evidence China is moving to a LOW [launch-on-warning] posture."[761]

Apart from the silo fields, China is also increasing the number of missile brigades by constructing new road-mobile ICBMs. This increase is driven by the construction of new missiles and nuclear modernization. According to P. W. Singer and Ma Xiu, from May 2017 to February 2020, the total number of China's ballistic missiles has grown by over 35 percent.[762] Moreover, in April 2020, two Type-94 SSBNs were handed over to the PLA Navy, making a total of six, instead of keeping them limited and focusing on more advanced Type-96 SSBN, which is still under construction.[763] This reflects China's willingness to invest in both quantity and quality.

These strategic nuclear developments in the Chinese nuclear inventory are taking place at a time when decades of economic development are presenting unique opportunities to the Chinese leadership to make huge investments in China's strategic nuclear forces. A

[760] Sebastien Roblin, "China is Building Over 100 Missile Silos in the Desert: Is It Playing a Nuclear 'Shell Game?'" *The National Interest*, July 12, 2021, accessed September 2, 2021, https://nationalinterest.org/blog/buzz/china-building-over-100-missile-silos-desert%E2%80%94-it-playing-nuclear-%E2%80%9Cshell-game%E2%80%9D-189506

[761] Office of the Secretary of Defense, "Military and Security Developments Involving the People's Republic of China 2021," 94

[762] Singer, P. W., and M. Xiu, "China's Missile Force Is Growing at an Unprecedented Rate," *Popular Science*, February 25, 2020, accessed January 3, 2021, https://www.popsci.com/story/blog-eastern-arsenal/china-missile-force-growing/

[763] Kristensen and Korda, "Chinese nuclear forces, 2020,"

large-scale nuclear weapons force modernization (excluding conventional force modernization) and build-up, as indicated by the new silo discoveries, new missile brigade formations, and qualitative and quantitative increase in SSBN forces, could not have occurred without a significant increase in defense spending, which certainly requires a large economy, something China has achieved in the last decade, as shown in the figures below.

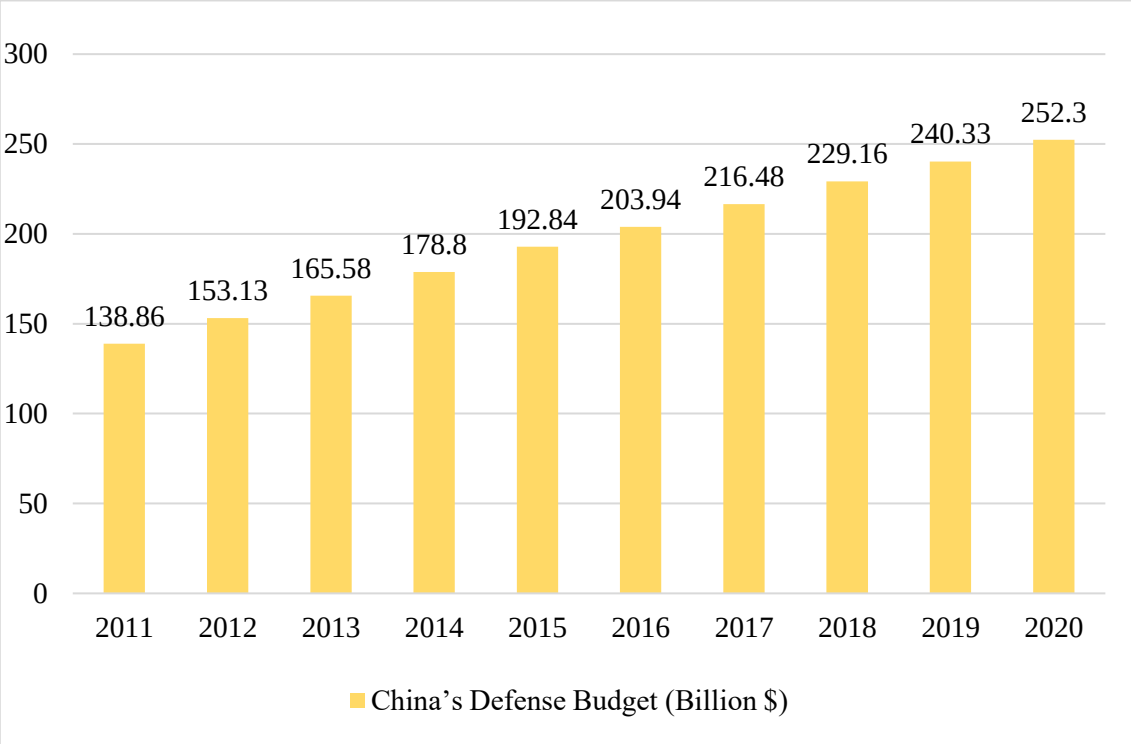

Figure 3: SIPRI: China's Defense Budget[764]

[764] "Military expenditure by country, in constant (2019) US$ m., 1988-2020" © SIPRI 2021, accessed December 31, 2021, https://sipri.org/sites/default/files/Data%20for%20all%20countries%20from%201988%E2%80%932020%20in%20constant%20%282019%29%20USD%20%28pdf%29.pdf

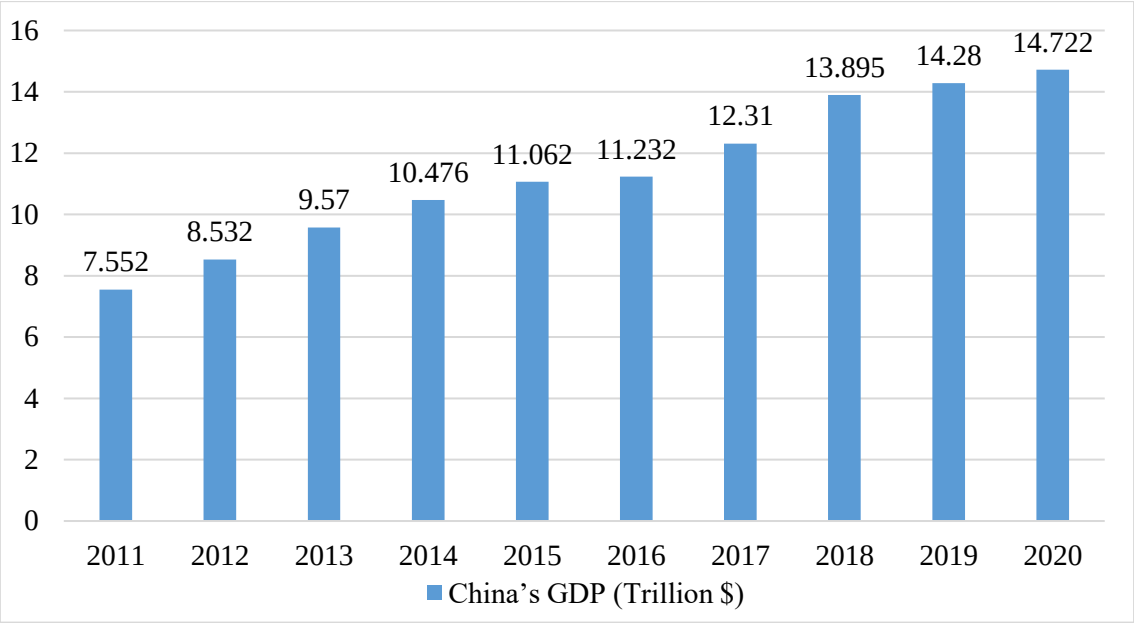

Figure 4: China's Gross Domestic Product (GDP) 2011-2020[765]

There could be several reasons why China is modernizing its nuclear forces under President Xi, although, that its economy has been growing in recent decades suggests this could have initiated this latest phase of modernization sooner than had been planned. China's economy has been growing for more than three decades now, and it surpassed Japan in 2011 and is likely to surpass the US economy by 2028.[766] It is plausible China did not double the size of its nuclear weapons (or triple or quadruple as now looks possible) earlier because China perceived no imminent external threat. Based on this argument, Alastair Johnston wrote in 1996 that "the pace and scope of Chinese nuclear weapons modernization is in large measure dependent on what happens outside China's borders."[767] China, given its need to focus on its domestic economy, potentially did not want to engage in a costly nuclear arms race until it reached a significant economic

[765] "GDP (current US$) – China," *The World Bank*, accessed December 31, 2021, https://data.worldbank.org/indicator/NY.GDP.MKTP.CD?end=2020&locations=CN&start=2011

[766] "Part I Overview China 2030: Building a Modern, Harmonious, and Creative High-Income Society," *China 2030*; "China to leapfrogs U.S. as world's biggest economy by 2028 - think tank," *World Economic* Forum, January 11, 2021, accessed August 4, 2021, https://www.weforum.org/agenda/2021/01/china-worlds-biggest-economy-usa-think-tank-covid-coronavirus/; "Chinese economy to overtake US 'by 2028' due to Covid," *BBC*, December 26, 2020, accessed August 4, 2021, https://www.bbc.com/news/world-asia-china-55454146; Evelyn Cheng and Yen Nee Lee, "New chart shows China could overtake the U.S. as the World's Largest Economy Earlier than Expected," *CNBC*, Updated, February 1, 2021, accessed August 4, 2021, https://www.cnbc.com/2021/02/01/new-chart-shows-china-gdp-could-overtake-us-sooner-as-covid-took-its-toll.html

[767] Alastair Iain Johnston, "Prospects for Chinese Nuclear Force Modernization: Limited Deterrence versus Multilateral Arms Control," *The China Quarterly*, No. 146, Special Issue: China's Military in Transition, (June 1996), 548-576

development point where it could more readily afford an arms race. Moreover, China's threat perception altered recently when the US announced its Pivot to Asia policy in November 2011, and this was deepened by the Trump administration's shift to a strategy of Great Power competition towards China, as discussed in Chapter Six.[768] Additionally, the role of president Xi is crucial in modernizing the nuclear weapons force compared to the previous Chinese leadership. Therefore, China's 9-10 percent annual economic growth over the past four decades means there are no longer any formidable obstacles to the robust development and modernization of Chinese nuclear weapons forces and the external environment has doubly compelled China to expand these forces. The next section examines the second internal factor that explains China's nuclear force modernization.

4.2.2 Bureaucratic Competition Between Different Organizations of the PLA

Before going nuclear, China's political elite created a National Defense Industry Special Commission (NDISC) in 1962 to establish control over the new nuclear weapons program.[769] The commission, also known as the Central Special Commission (CSC), was made up of 15 members from the political, military, and scientific domains, and was tasked with coordinating the nuclear weapons development program.[770]

However, things began to change when Deng Xiaoping took power in 1978. Unlike their predecessors, the new leadership had less military experience and introduced new changes (including opening up to the world economically), leading to greater collective leadership decisions. These changes lead to the establishment of new institutions and the bureaucratization and institutionalization of Deng's government. The PLA also experienced new changes and restructuring in 1978, as the PLA Air Force, Navy, and then Second Artillery gained promotions and prominence. However, the Army remained the predominant service.[771]

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[768] Janine Davidson, "The U.S. 'Pivot to Asia' *American Journal of Chinese Studies*," Vol. 21, Special Issue (June 2014), 77-82

[769] Eric Heginbotham, Jacob L. Heim, and Christopher P. Twomey, "Of Bombs and Bureaucrats: Internal Drivers of Nuclear Force Building in China and the United States," *Journal Of Contemporary China*, Vol. 28, No. 118, (2019), 538-557

[770] John Lewis and Xue Litai, *China Builds the Bomb* (Stanford, California: Stanford University Press, 1988)

[771] Robert D. Blackwill, "The U.S. Pivot to Asia and American Grand Strategy," *CFR*, accessed February 12, 2021, https://www.cfr.org/project/us-pivot-asia-and-american-grand-strategy; Derek Grossman and Michael S. Chase, "Xi's Consolidation of Power at the 19th Party Congress: Implications for PLA Aerospace Forces, *China Brief*, Vol. 17, Issue. 16, (2017), 7-10

The CSC helped political leaders to maintain tight control over China's nuclear weapons program. This was evident as, despite having a successful test of enhanced radiation weapons in 1988, the political leadership refused to deploy it because this type of warhead was against China's nuclear policy.[772] We could imagine, having mastered a new weapon, the technology leading to a change in policy; not in the case of China in this instance. The same was the case with decisions related to MIRVing. China was technologically able to deploy a MIRVed missile by 1990, but it chose not to do so for decades until 2015.[773] There was some impetus from military and scientific bureaucracies in both cases, but political support was not forthcoming.[774]

Under President Jiang Zemin (1993-2003) and Hu Jintao (2003-2013), China focused on internal development, and their policies brought no notable change in China's foreign policy.[775] Though each had different domestic priorities, they were mainly related to the socio-economic and institutional development in China. During the Jintao regime power was de-centralized and intuitions were strengthened.[776] Increased institutionalism circumscribed the CSC and political leadership role, and increased the PLA's role and position in the inter-service competition for nuclear weapons policymaking.[777] China's 2004 Defense White Paper notes,

> The PLA gives priority to the building of the Navy, Air Force and Second Artillery Force to seek balanced development of the combat force structure, in order to strengthen the capabilities for winning both command of the sea and command of the air, and conducting strategic counter-strikes.[778]

[772] Jonathan Ray, *Red China's 'Capitalist Bomb': Inside the Chinese Neutron Bomb Program* (Washington DC: Center for the Study of Chinese Military Affairs, Institute for National Strategic Studies, National Defense University, 2015), 2
[773] Tong Zhao and David Cromer Logan, "What if China develops MIRVs?" *Bulletin of the Atomic Scientists*, March 24, 2015, accessed August 4, 2021, https://thebulletin.org/2015/03/what-if-china-develops-mirvs/; Missile Defense Project, "DF-5, Missile Threat," *Center for Strategic and International Studies*, August 12, 2016, last modified August 2, 2021, accessed August 4, 2021, https://missilethreat.csis.org/missile/df-5-ab/
[774] Heginbotham et al., "Of Bombs and Bureaucrats,"
[775] David Shambaugh, *China's Leaders: From Mao to Now* (Cambridge, MA.: Polity Press, 2021) 161-209, 255; Shannon Tiezzi, "David Shambaugh on China's Political Personalities, from Mao to Xi," *The Diplomat*, September 8, 2021, accessed January 3, 2022, https://thediplomat.com/2021/09/david-shambaugh-on-chinas-political-personalities-from-mao-to-xi/
[776] Ibid, 255-317
[777] Heginbotham et al., "Of Bombs and Bureaucrats,"
[778] China State Council Information Office, *China's National Defense in 2004*, December 2004, accessed February 09, 2021, 2004, http://www.china.org.cn/e-white/20041227/

In April 2004, the PLASAF, PLAN, and PLAAF commanders were promoted to a CMC membership, a position previously held by PLA Army only.[779] The Defense White Paper of 2006 stated that the restructuring of the PLA had increased the proportion of PLA Air Force, Navy, and SAF personnel by 3.8 percent, and the PLA Army personnel proportion was decreased by 1.5 percent.[780] Later the PLASAF's strategic deterrence capabilities were enhanced, as the 2010 Defense White Paper, notes the PLASAF "strives to push forward its modernization and improves its capabilities in rapid reaction, penetration, precision strike, damage infliction, protection, and survivability, while steadily enhancing its capabilities in strategic deterrence and defensive operations."[781] The promotions of commanders of the PLARF were also streamlined as per other services, giving them equal bureaucratic weight.[782]

The elevation of the PLA Rocket Force as a new service by the end of 2015 made Chinese analysts view the upgrade as occurring because the PLASAF had all the characteristics such as size, personnel strength and force capability, and level of strategic importance to qualify for new services like PLAA, PLAN or PLAAF.[783] According to some experts, the elevation of the PLARF and its political stewardship by Xi may cause the PLARF to advocate for additional nuclear weapons force modernization and for a "more flexible interpretation of the nuclear weapons use doctrine."[784]

With President Xi in power, pro-nuclear weapons and policy-related constituency is also growing in other services. For instance, the PLA Navy now operates six Type 94 SSBNs, each carrying 12 JL-2 SLBMs. The next-generation SSBN Type 96 and JL-3 SLBM are in the development phase.[785] With a more robust second-strike capability emerging, challenges in command and control, and doctrine, particularly related to delegation of power (discussed in Chapter Five), future trends in the PLAN would suggest an increase

[779] James Mulvenon, "The King Is Dead! Long Live the King! The CMC leadership transition from Jiang to Hu," *China Leadership Monitor* 13, (2005), 6
[780] State Council Information Office, "China's National Defense in 2006," December 2006, accessed February 9, 2021, http://en.people.cn/whitepaper/defense2006/defense2006.html
[781] State Council Information Office, "Modernization of the People's Liberation Army, China's National Defense in 2010," Information Office of the State Council, accessed August 4, 2021, http://english.www.gov.cn/archive/white_paper/2014/09/09/content_281474986284525.htm
[782] Heginbotham, et al., "Of Bombs and Bureaucrats,"
[783] "Expert: Why did the Second Artillery Corps be upgraded to the Fourth-Largest Service Rocket Army?" *Qianjiang Evening News*, January 9, 2016, accessed February 9, 2021, https://mil.huanqiu.com/article/9CaKrnJT1i9
[784] Heginbotham et al., "Of Bombs and Bureaucrats,"
[785] Zhou Wa, "China seeks to Calm US Fears over Missile," *China Daily*, January 16, 2014, accessed February 5, 2021, https://www.chinadaily.com.cn/china/2014-01/16/content_17238265.htm

in its weight in strategic decision-making processes. According to the 2020 US DoD annual report to the US Congress on China, the PLAAF is building a strategic bomber H-6N for an air-based nuclear delivery platform.[786] Like the PLAN, the PLAAF would also require changes in the delegation of power regarding nuclear use and on the level of alertness as China's NFU rejects pre-emptive strikes.[787] Therefore, together, the PLAN and PLAAF, force modernization and improving strike capabilities may place additional pressure on China's political leadership to forgo NFU and put a premium on launch-on-warning (discussed in Chapter Five). Such an enhanced role would earn both services a position that increases their role in national security policy making.

Additionally, the PLARF outlined arguments to put a similar kind of pressure on the political leadership. A brief scenario below explains how PLARF may mobilize and secure political support in its favor, generating institutional competition for power and influence. From 1966, the PLASAF was handling nuclear missiles exclusively; however by the early 1990s, it also took charge of the conventional missile stockpile, and currently, a majority of the PLARF brigades operate conventional missiles.[788] Due to comingling of conventional and nuclear missile forces, and based on shared standard operating procedures (SOPs) and experiences related to organizing dispersal, establishing communications under crisis, and preparing counterattacks, PLARF officials under crisis conditions may apply or transfer conventional missile force SOPs to nuclear missile force.[789] For instance, in such a scenario, the dual-capable DF-26 missile, based on its

[786] The State Council Information Office of the People's Republic of China, "China's National Defense in the New Era," July 2019, accessed February 1, 2021, http://english.www.gov.cn/archive/whitepaper/201907/24/content_WS5d3941ddc6d08408f502283d.html; Mike Yeo, "Video reveals Chinese H-6N Bomber Carrying Suspected Hypersonic Weapon," *Defense News*, October 19, 2020, accessed February 3, 2021, https://www.defensenews.com/global/Indo-Pacific/2020/10/19/video-reveals-chinese-h-6n-bomber-carrying-suspected-hypersonic-weapon/

[787] Ben Lowsen, "Is China Abandoning Its 'No First Use' Nuclear Policy?" *The Diplomat*, March 21, 2018, accessed December 12, 2021, https://thediplomat.com/2018/03/is-china-abandoning-its-no-first-use-nuclear-policy/

[788] Michael S. Chase, "PLA Rocket Force Modernization and China's Military Reforms," Testimony presented before the U.S.-China Economic and Security Review Commission on February 15, 2018, accessed September 15, 2021, https://www.rand.org/content/dam/rand/pubs/testimonies/CT400/CT489/RAND_CT489.pdf; Anthony H. Cordesman and Joseph Kendall, *Chinese Strategy and Military Modernization in 2016: A Comparative Analysis* (Center for Strategic and International Studies, 2016), 380; Institute of International Security Studies (IISS), *Military Balance, 2018* (London: IISS, 2018)

[789] Fiona S. Cunningham and M. Taylor Fravel, "Dangerous Confidence? Chinese Views on Nuclear Escalation," *International Security*, Vol. 44, No. 2 (2019), 61-109; Ankit Panda, "China's Dual-Capable Missiles: A Dangerous Feature, not a Bug," *The Diplomat*, May 13, 2020, accessed December 29, 2021, https://thediplomat.com/2020/05/chinas-dual-capable-missiles-a-dangerous-feature-not-a-bug/; Tong Zhao and Li Bin, "The Underappreciated Risks of Entanglement: A Chinese Perspective," *CEIP*, November 8, 2017, accessed December 29, 2021, https://carnegieendowment.org/2017/11/08/underappreciated-risks-of-entanglement-chinese-perspective-pub-73164

accuracy, would give China the capability of "conducting precision strikes against ground and ship targets, potentially threatening U.S. land and sea-based forces as far away as Guam."[790] Similarly, the PLA has been improving the C4ISR and space-based radar capabilities to achieve the Go-Onto-Target (GOT) strike capability to engage moving targets, such as engaging the DF-21D – the carrier-killer – and the Anti-Submarine Ballistic Missile (ASBM) DF-26 against under-water vessels.[791] When these capabilities are applied to the DF-21C, it would be able to target land-based mobile targets such as the Patriot Advanced Capability-3 (PAC-3) – mobile launching battery or station.[792] Moreover, the conventional missile force operates on salvo capability and is meant for warfighting, unlike the nuclear force that operates on a war-avoiding strategy. Without an organizational firewall between the conventional and nuclear missile forces, strategists may intentionally or unintentionally apply the conventional missile force strategy to the nuclear missile force. This may lead to a quick nuclear escalation during a crisis.[793] In short, the comingling of the conventional and nuclear missile forces may lead to competition between the PLA services for maintaining the upper hand in the crisis, and lack of organizational firewalls may lead PLARF to exert more pressure on the political leadership, particularly in a crisis, suggesting limited options or strategies which may have a negative impact on strategic and crisis stability.

For China, such mixed organizational/bureaucratic processes may place pressure internally to achieve full-spectrum nuclear warfighting capabilities, which China is trying to achieve, as discussed in the next chapter in detail. Briefly, the comingling of conventional and nuclear forces presents China with an opportunity to approach conflict from multiple dimensions, beginning with a strategy of flexible response, escalation control, and possible launches of damage-control strikes against a nuclear adversary if necessary. Importantly, the point of the discussion here is that these tangible capabilities could prompt PLARF commanders, particularly the PLAN's SSBN commanders, to campaign and influence China's political leadership to redefine and revisit their nuclear doctrine and other operational SOPs. This highlights how organizational/bureaucratic

[790] Office of the Secretary of Defense, *Annual Report to Congress: Military and Security Developments Involving the People's Republic of China* (Washington, DC: Department of Defense, 2016), 71
[791] Eric Heginbotham, Michael Chase, Jacob L. Heim, Bonny Lin, Mark Cozad, Lyle Morris, Christopher P. Twomey, Forrest Morgan, Michael Nixon, Cristina Garafola, and Samuel Berkowitz, *China's Evolving Nuclear Deterrent*, (Santa Monica, CA: RAND Corporation, 2017), 116
[792] "Current U.S. Missile Defense Programs at a Glance," *Arms Control Association*, August 2019, accessed February 5, 2021, https://www.armscontrol.org/factsheets/usmissiledefense
[793] Heginbotham et al., *China's Evolving Nuclear Deterrent*, 114-116

factors inside China's military system may lobby for the modernization of China's nuclear weapons doctrine.

4.2.3 **The Individual level – Xi Jinping**

The role of individual leaders is identified by neoclassical realists' as one of the other important internal factors which can influence policy. In China's nuclear force modernization, President Xi Jinping's individual preferences and influence have significant importance. The shift started in 2012 when President Xi became General Secretary of the Chinese Communist Party and Chairman of the Central Military Commission (in 2013, he became President). He came with a new vision for China – what he calls "the Chinese Dream of national rejuvenation,"[794] and his efforts to deepen his control throughout the Chinese state from 2013 to 2021 mean he has become the most powerful Chinese leader since Mao.[795] A key idea behind his vision is to restore China's status as a great power. To achieve this, Xi initiated military reforms in 2015 and increased military spending commensurate with China's growing economic power. President Xi is committed to bringing PLA to the level of a "world-class force" by the mid-twenty first century, which would be able to "fight and win" great wars.[796] Nuclear weapon capabilities are viewed as a component for achieving this.

According to one article, China's former President, Hu Jintao, in his first three years as Chairman of the CMC, made 36 visits to military events, whereas President Xi made 53 appearances, stressing the importance he places on the military.[797] A news report of January 2015 claimed that since Xi took office, he spent half a day each week in the CMC building, whereas Hu rarely visited the CMC office building.[798] Under Xi's chairmanship of the CMC, and prior to the December 2015 reforms, more than 20 working groups examined various aspects of military reforms, and more than 150 revisions of the reform

[794] Xi Jinping, "Secure a Decisive Victory in building a Moderately Prosperous Society in All Respects and Strive for the Great Success of Socialism with Chinese Characteristics for a New Era," Delivered at the 19th National Congress of the Communist Party of China, *Xinhua Net*, October 18, 2017, accessed February 11, 2021, http://www.xinhuanet.com/english/download/Xi_Jinping's_report_at_19th_CPC_National_Congress.pdf

[795] Nan Li, "The Top Leaders and the PLA: The Different Styles of Jiang, Hu, and Xi," in Phillip C. Saunders and Andrew Scobell eds. *PLA Influence on China's National Security Policymaking* (Stanford, Calif.: Stanford University Press, 2015), 120-140

[796] Ibid

[797] Joel Wuthnow and Phillip C. Saunders, "Chinese Military Reforms in the Age of Xi Jinping: Drivers, Challenges, and Implications," *China Strategic Perspectives 10*, 38, (2017)

[798] Ji Beiqun, "Military Generals are Chasing after Mao Zedong and Xi Jinping, 'think far-sighted,' *Duowei News*, January 10, 2015, accessed February 11, 2021, http://china.dwnews.com/news/2015-01-10/59629032.html

plan were made.[799] None of Xi's predecessors, other than Mao, was motivated enough or had the domestic power and influence to introduce such significant reforms. These comprehensive measures taken by Xi marked the beginning of the second wave of China's nuclear force modernization.

Once the reforms were announced, President Xi appeared directly involved in pushing them forward. To implement them, he introduced a new political strategy. He merged military reforms with broader national reforms, making it difficult for others to oppose military reforms domestically, and said military reform was part of "the will of the CCP and act of state."[800] On December 31, 2015, at a ceremony for establishing new military services, including the PLA Army headquarters, PLA Strategic Support Force, and PLA Rocket Force, Xi personally met the new commanders and handed over flags of their services.[801] Xi has also installed handpicked aides within the PLA to implement his reform agenda. For instance, Lieutenant General Qin Shengxiang, who serves in the position of director of the CMC General Office, was also appointed as director of the new CMC Reform and Organization Office.[802] President Xi also introduced a process of restructuring, transforming PLA into seven military regions and five theatre commands, significantly affecting the outlook of the PLA by aligning it with international standards.[803] The figures below show the before and after reforms structure of China's armed forces.

[799] Bai Zonglin, "Perspective on China's Military Reform"
[800] Ibid
[801] Li Jing, "President Xi Jinping lays down the Law to the Chinese Army in First 'Precept' Speech since Mao Zedong," *South China Morning Post*, January 4, 2016, accessed February 11, 2021, https://www.scmp.com/news/china/diplomacy-defense/article/1898000/president-xi-jinping-lays-down-law-chinese-army-first
[802] Wuthnow and Saunders, "Chinese Military Reforms in the Age of Xi Jinping,"
[803] Ziyu Zhang, "China's Military Structure: What are the Theatre Commands and Service Branches?" *SCMP*, August 15, 2021, accessed September 15, 2021, https://www.scmp.com/news/china/military/article/3144921/chinas-military-structure-what-are-theatre-commands-and-service

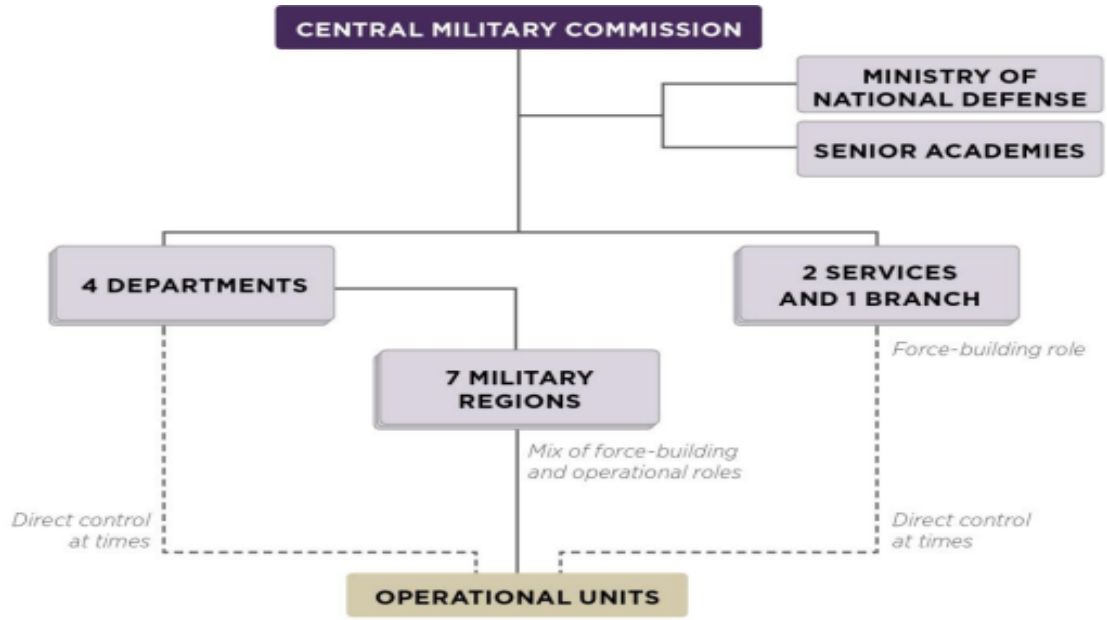

Figure 5: The organizational structure of the PLA before the 2015 reforms[804]

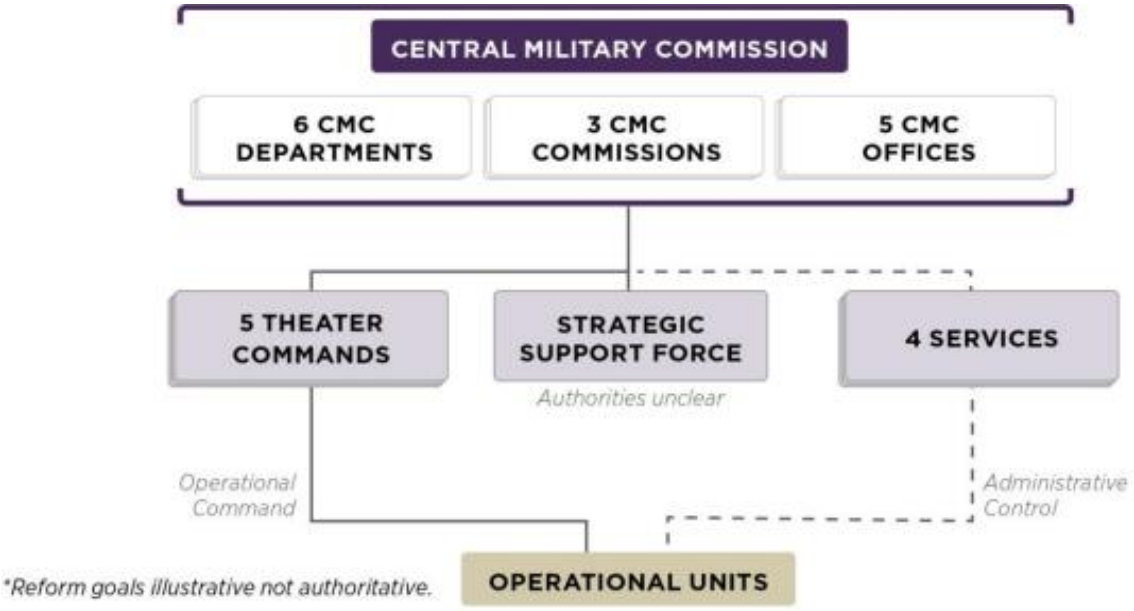

Figure 6: The organizational structure of the PLA after the 2015 reforms[805]

The reforms were introduced to achieve two main objectives: firstly to strengthen CCP control over the PLA; and secondly to restructure the PLA to modernize it and make it

[804] Office of the Secretary of Defense, "Annual Report to Congress: Military and Security Developments Involving the People's Republic of China 2016," accessed August 5, 2021, https://dod.defense.gov/Portals/1/Documents/pubs/2016%20China%20Military%20Power%20Report.pdf
[805] Secretary of Defense, "Military and Security Developments Involving the People's Republic of China 2016"

more effective for joint operations. Several structural changes were made to achieve these objectives.[806] The command structure of the PLA was altered completely. This naturally strengthens Xi's power and direct control over the PLA services as Xi is also the chairman of the CMC. Before the 2015 reforms, the military units on the ground were commanded by two parallel chains of command; one from service headquarters, such as the air force and navy; the other from military regions and connected to the General Staff Department (GSD) of PLA, and the CMC.[807]

Additionally, the PLA previously lacked a service headquarters as the Army-dominated GSD performed the role. With the reforms, bureaucratic complexities and procedures removed, and the chain of command structure was more clearly established and centralized. The army-dominated GSD, General Political Department (GPD), General Logistics Department (GLD), and General Armaments Department (GAD) were dismantled, and their roles were subsumed by seven departments, three commissions, and five attached organs concentrated directly under the CMC. Now, the CMC has overall charge of China's armed forces, the theatre commands maintain the direction of operations, and the service headquarters takes care of force development.[808] However, the command structure of the PLARF, which was highly centralized and under the direct control of the Central Party Committee, the CMC, and Chairman Xi, has remained unchanged.[809] This reflects that Xi's direct command also extends over conventional missile forces, as the PLARF operates both conventional and nuclear missile forces.

The reports related to training and exercises between the PLARF and the newly-established theater commands are related to improving operational coordination between them rather than improving or directing commands from theater commands to the PLARF units on the ground.[810] This also explains that the PLARF maintains its independent role under the direct command of the CMC, headed by President Xi. Though there was no change in the command structure when the PLASAF was restructured into the PLARF, the conversion from an independent branch to an independent service is likely to expand

[806] Bates Gill and Adam Ni, "China's Sweeping Military Reforms: Implications for Australia," *Security Challenges*, Vol. 15, No. 1, (2019), 33-46
[807] Ibid
[808] Ibid
[809] David Logan, "PLA Reforms and China's Nuclear Forces," *Joint Force Quarterly 83*, October 1, 2016, accessed May 21, 2021, https://ndupress.ndu.edu/Media/News/Article/969665/pla-reforms-and-chinas-nuclear-forces/
[810] Dan Qingwei, "Rocket Force Base explores Standardization of Joint Operational Processes," *PLA Daily*, April 1, 2016, accessed May 21, 2021, http://military.people.com.cn/n1/2016/0401/c1011-28243986.html

the number of operations that the PLARF is envisaged to undertake, and therefore increase the number of its personnel.[811] Previously, in military writings, the operational conduct of the PLASAF was considered central to any campaign, but being a branch (not service), it was viewed as an institution supporting the other services.[812] After the reforms, according to one professor at the PLARF Command Academy, the PLARF would be able to "fight independently," which means fighting a nuclear war without seeking support from other services.[813]

As per neoclassical realism, internal factors can induce change, and President Xi has played a significant role in initiating and implementing military modernization reforms in China, including restructuring and expanding China's nuclear forces. He personally led a team to devise the reform plans and appointed his close aides to implement them.[814] Xi's *China Dream* is to build a world-class military by 2050 and be able to fight and win great wars.[815] Presumably, the modernization of China's nuclear forces is designed to facilitate and achieve that goal. These reforms have set the trajectory for China's armed forces, reflecting the structure of the armed forces of other great powers, such as the US.[816]

4.2.4 **Discussion**

All the internal factors identified above have influenced China's nuclear weapons force modernization, but it appears that the role of President Xi has been more decisive than the other factors. This finds support given China's economic rise and the rise in GDP started in the 1980s, and the associated significant rise in the defense budget of China is more than a decade old. However, the second wave of China's nuclear force modernization is a recent phenomenon, starting in 2013 under President Xi.[817] China

[811] Logan, "PLA Reforms and China's Nuclear Forces"
[812] John W. Lewis and Xue Litai, "Making China's Nuclear War Plan," *Bulletin of the Atomic Scientists* Vol 68, No. 5, (2012) 54
[813] Zhang Zhouxiang, "Rocket Force to Protect National Interests," *China Daily*, January 5, 2016, accessed May 21, 2021, http://usa.chinadaily.com.cn/opinion/2016-01/05/content_22933648.htm
[814] Bai Zonglin, "Perspective on China's Military Reform; Logan, PLA Reforms and China's Nuclear Forces"; Wuthnow and Saunders, "Chinese Military Reforms in the Age of Xi Jinping"
[815] Xi Jinping, "Secure a Decisive Victory in building a Moderately Prosperous Society in All Respects and Strive for the Great Success of Socialism with Chinese Characteristics for a New Era, Delivered at the 19th National Congress of the Communist Party of China," *Xinhua Net,* October 18, 2017, accessed February 11, 2021, http://www.xinhuanet.com/english/download/Xi_Jinping's_report_at_19th_CPC_National_Congress.pdf
[816] Logan, "PLA Reforms and China's Nuclear Forces"
[817] Missile Defense Project, "DF-41 (Dong Feng-41 / CSS-X-20)," Missile Threat, Center for Strategic and International Studies, August 12, 2016, last modified October 8, 2019, accessed May 21, 2021, https://missilethreat.csis.org/missile/df-41/;

could have started its modernization earlier but chose not to do so; Xi's arrival changed this.

The emerging inter-services military organizational/bureaucratic factors may also demand changes in the nuclear doctrine in the near future, such as altering the NFU, but these services are under the direct and strict control of the CMC, headed by Xi, who has centralized power to himself throughout Chinese society, the economy and militarily to a degree not seen since the time of Chairman Mao.[818] Therefore, the role of Xi Jinping as an individual leader is key to understanding the internal factors that drive and influence the trajectory of China's nuclear forces. President Xi's internal national reforms and military and nuclear modernization, to be more fully achieved by 2050, reflect his *China Dream*, which is part of his ambition to turn China's military into a "world-class" organization.[819]

In the case study of China, neoclassical realism paints a multidimensional and complex picture showing how different internal and external factors respond to similar external threat situations in a particular way, reflecting why China's ongoing nuclear force modernization is taking place in the way it is.

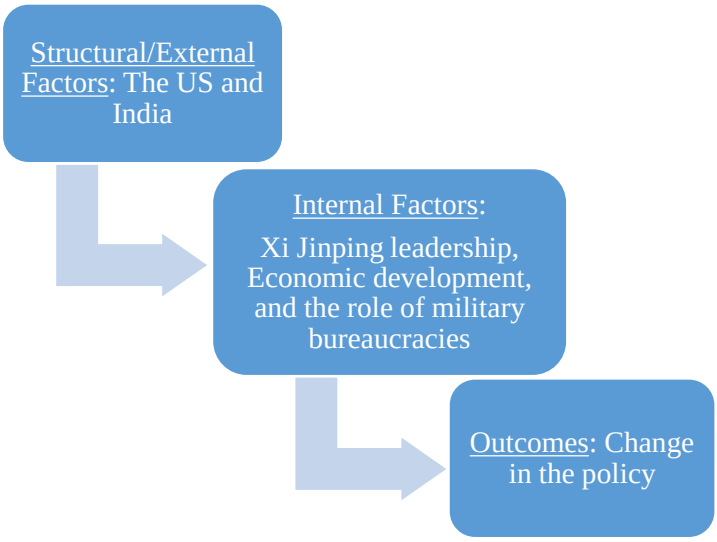

Figure 7: Neoclassical Realism - An explanation for China's nuclear policy

[818] Paul C. Trogen and Yuan Xu, "Limits to Power," *Journal of Power, Politics & Governance*, Vol. 8, No. 2 (December 2020), 1-11; Brantly Womack, *The Foundations of Mao Zedong's Political Thought 1917–1935* (Hawaii: The University Press of Hawaii, 1982)
[819] "Xi Focus: Xi Stresses racing against Time to Reach Chinese Dream," *Xinhua Net*, January 23, 2020, accessed December 12, 2021, http://www.xinhuanet.com/english/2020-01/23/c_138729706.htm

Overall, and consistent with the assumptions of neoclassical realism, the structural imperatives/external factors appear to have the most significant impact on China's nuclear policies. There are a few reasons for this. Firstly, according to realism, the international system is anarchic, which means there is no central authority, and the primary objective of China in this anarchic system is survival. Therefore, whatever the outcomes may be, China's nuclear policies are primarily driven by structural factors, the threat to its survival (mainly from the US and to a lesser extent, India) and the need to maintain sovereignty based on China's threat perceptions from others. This is why the US nuclear weapons program and its advancement in certain key areas (especially technologically) is considered a critical threat, whereas China does not feel threatened by the nuclear weapons of Pakistan; Pakistan lacks malign intent as clearly explained by Scott Sagan.[820] To China, the US has a potential first-strike capability or could achieve that in the future. The US comprehensive nuclear weapons modernization that started during the Obama administration and his administration's Pivot to Asia led Xi to enact a more assertive nuclear policy and force modernization in response. Amidst these developments, the deterioration in US-China relations during the Trump administration, which has continued into Biden's tenure, has led China to assume the US has hostile intent; Washington has both a threatening capability and intent. China must modernize its nuclear forces to deal with this external factor.

Internal factors are also important, but mostly, these are responses to external pressures and impediments. The level of economic and technological capabilities, the role of bureaucracies, and individual's threat perception that shape a state's policies do not predominantly determine those policies. The structure is inescapable and forces the state to respond to certain external forces in a similar fashion. This suggests that Xi, or practically any other Chinese leader, would eventually have responded to the growing threat posed by US nuclear modernization and counterforce advancements by responding with its own nuclear modernization. However, the degree of response could vary from individual to individual. For instance, when the predecessor of Xi, Hu Jintao, stepped down in 2013, his rule was viewed as "ten lost years."[821] In contrast, Xi has played an extraordinary role since he became president. China, economically and technologically,

[820] Scott D. Sagan, "Why Do States Build Nuclear Weapons? Three Models in Search of a Bomb," *International Security*, Vol. 21, No. 3 (Winter, 1996-1997), 54-86; Joseph Cirincione, *Bomb Scare. The History and Future of Nuclear Weapons* (New York: Columbia University Press, 2007), 47
[821] Tiezzi, "David Shambaugh on China's Political Personalities"

was viable enough to initiate nuclear weapons force modernization decades earlier. Moreover, the US 2010 NPR, and 2011 Pivot to Asia policy, announced by the Obama administration, never met any serious response from China until President Xi came to power. Additionally, President Xi's national rejuvenation plans for the *China Dream* are neither restricted to military modernization nor to policy-making for the next decade. It is a decades-long plan to complement "the third revolution" in China.[822] Furthermore, nuclear weapons force modernization is one part of military modernization that is again part of broader general reforms, which continues to play out today.

4.2.5 **Conclusion**

This chapter has examined the role of internal factors, as identified by neoclassical realism, in China's nuclear weapons force modernization. It has determined that China's decades-long continued economic development has provided the base for costly nuclear weapons force modernization, which otherwise, with a struggling economy, it may have been unable to achieve. The inter-services nuclear constituencies in the PLA and the PLARF are likely to impact nuclear weapons force modernization in their respective domains. These services may demand more flexibility in the nuclear doctrine due to the different requirements related to command and control and nuclear use authority. Lastly, the chapter maintains that the role of President Xi is extraordinary and powerful compared to other internal variables. He has introduced general reforms, of which military reforms are one part. It appears that military modernization, part of which is nuclear weapons force modernization, is connected to his *China Dream* – an initiative near and dear to Xi's heart and his effort to transform China into a great power in the twenty-first century. Achieving this requires dealing with external threats to China's rise and its sovereignty – with the US nuclear weapons program being a key factor.

After exploring the historical evolution of China's nuclear weapons program and external and internal drivers of change, the next chapter explores what changes these factors have brought to China's nuclear weapons program. In other words, the next chapter critically examines China's ongoing and emerging nuclear weapons policy and force modernization. Doing this is important because it will help to foresee the future of China's nuclear weapons program. Moreover, it will also help us examine how the future

[822] Excerpt: The Third Revolution, Excerpted from THE THIRD REVOLUTION: Xi Jinping and the New Chinese State. Copyright 2018 by Oxford University Press and published by Oxford University Press, *Council on Foreign Relation*, accessed August 5, 2021, https://www.cfr.org/excerpt-third-revolution

trajectory of China's nuclear weapons program is affecting and will affect, strategic stability in the Indo-Pacific region.

Chapter Five

China's Contemporary Nuclear Weapon Policy and Force Modernization: A Critical Appraisal

5.1 Introduction

The chapter examines China's contemporary nuclear weapons policy and ongoing nuclear force modernization, which relates to the second primary research question; How is China's nuclear weapons program evolving? The chapter is divided into two parts: the first part deals with China's nuclear policy since 2006 when it published its first Defense White Paper. This part is further divided into three sub-sections. The first explores the contours of China's nuclear weapons strategy, and the second deals with China's operational nuclear strategy and the defined roles for its nuclear forces. The third studies China's nuclear command, control, and communication (NC3) system. The second part of the chapter examines China's nuclear weapons force modernization in 2020 and the major developments that occurred.

The chapter aims to answer the following question: Why is China seemingly giving up what is dubbed the 'minimum means of reprisal,' and why it is increasing and modernizing the PLARF, the PLAN, and the PLAAF for more significant nuclear roles? Chapters Three and Four explained that China perceives various levels of threat from key nuclear states, though this is changing over time, generating internal responses in China, leading it to modernize its forces. China's ambitions and interests are growing as its power increases, which is expected and in line with realist assumptions and the history of the rise of great powers. Thus, collectively, all of this fleshes out our understanding why China is potentially giving up the 'minimum means of reprisal' and why it is increasing and modernizing the PLARF, the PLAN, and the PLAAF for more significant nuclear roles.

Open source literature is used to analyze the emerging changes in China's nuclear weapons policy and doctrine, military capabilities, and organizational structures. It draws on English translations of Chinese-language materials such as Defense White Papers, Science of Military Strategy books and other campaign books, PLA officers' writings, military newspapers, reports from track 1.5 (semi-official), and track 2 (unofficial) dialogues, and other secondary sources. The chapter employs the term PLA Second

Artillery Force (PLASAF) when referring to China's nuclear missile force development before 2016, and the PLA Rocket Force (PLARF) refers to the force after 2016.

A large body of literature on China's nuclear weapons program significantly downplays the emerging changes in its nuclear weapons program and force modernization.[823] Most of the literature examines the nuclear weapons program from a minimum deterrence and nuclear counterattack doctrine perspective; a few view it as a nuclear doctrine of assured retaliation.[824] However, this chapter takes a different position. The contribution in this chapter in relation to these established positions in the literature asserts that China's nuclear force modernization is large-scale and comprehensive, including land, air, sea, and C4ISR components, and aimed at achieving an operational nuclear triad. The increase in existing and new nuclear-related platforms and newly discovered massive missile silo fields requires more nuclear weapons and certain policy changes to maximize their deterrence and warfighting value. For instance, the naval leg of the triad, comprised of operational SSBNs with SLBMs, is leading to policy changes, such as decentralization of power or delegation of authority to launch nuclear weapons, a change in the NFU policy for launch on warning or launch under attack, and a change from negative use control to positive use control of nuclear weapons. Similarly, a 2021 report from the US DoD on

[823] James Mulvenon, "Chinese and Mutually Assured Destruction: Is China Getting "MAD? "in *Getting MAD: Nuclear Mutual Assured Destruction, Its Origins and Practice*, ed. Henry D. Sokolski (Carlisle, PA: Strategic Studies Institute (SSI) of the U.S. Army War College, November 2004); John Costello and Joe McReynolds, *China's Strategic Support Force: A Force for a New Era*. (Washington D.C., US Government Publishing Office, 2018); Liping Xia, "China's Nuclear Doctrine: Debates and Evolution," June 30, 2016, accessed March 13, 2020, https://carnegieendowment.org/2016/06/30/china-s-nuclear-doctrine-debates-and-evolution-pub-63967; James Mulvenon et al., *Chinese Responses to U.S. Military Transformation and Implications for the Department of Defense* (Santa Monica, CA: RAND Corporation, 2006); Li Bin and Tong Zhao, eds. *Understanding Chinese Nuclear Thinking*. (Washington, D.C.: Carnegie Endowment for International Peace, 2016); Eric Heginbotham, Michael S. Chase, Jacob L. Heim, Bonny Lin, Mark R. Cozad, Lyle J. Morris, Christopher P. Twomey, Forrest E. Morgan, Michael Nixon, Cristina L. Garafola, Samuel K. Berkowitz, *China's Evolving Nuclear Deterrent: Major Drivers and Issues for the United States* (Santa Monica, Calif.: RAND Corporation, RR-1628-AF, 2017); Fiona Cunningham, "Nuclear Command, Control, and Communications Systems of The People's Republic of China", NAPSNet Special Reports, July 18, 2019, accessed January 28, 2020, https://nautilus.org/napsnet/napsnet-special-reports/nuclear-command-control-and-communications-systems-of-the-peoples-republic-of-china/

[824] Michael S. Chase and Cristina L. Garafola, "China's Search for a Strategic Air Force," *Journal of Strategic Studies*, Vol. 39, No. 1 (2016); Fiona S. Cunningham and M. Taylor Fravel, "Dangerous Confidence? Chinese Views on Nuclear Escalation," *International Security*, Vol. 44, No. 2, (2019), 61-109; Zhao Tong and Li Bin, "The Underappreciated Risks of Entanglement: A Chinese Perspective," in James M. Acton, (ed.) *Entanglement: Russian and Chinese Perspectives on Non-Nuclear Weapons and Nuclear Risks* (Washington, D.C.: Carnegie Endowment for International Peace, 2017), 47-76; Thomas Christensen, "The Meaning of the Nuclear Evolution: China's Strategic Modernization and U.S.-China Security Relations," *Journal of Strategic Studies*, Vol. 35, No. 4, (2012), 469-471; Fiona Cunningham and M. Taylor Fravel, "Assuring Assured Retaliation: China's Nuclear Posture and U.S.-China Strategic Stability," *International Security*, Vol. 40, No. 2, (2015) 7-50; M. Taylor Fravel and Evan S. Medeiros, "China's Search for Assured Retaliation: The Evolution of Chinese Nuclear Strategy and Force Structure, *International Security*, Vol. 35, No. 2, (2010), 48-87

China asserted that China intends to have at least 1,000 warheads by 2030. This is almost triple the size of its current nuclear weapons inventory, which is logical given the scope and scale of China's modernization and the trend towards a warfighting force.[825] Finally, the chapter asserts that with current and emerging nuclear force modernization, China appears to be pursuing full-spectrum deterrence (mimicking the US) and seeks the capability required for a nuclear warfighting doctrine.[826] The primary role of its nuclear weapons remains to deter an adversary, though its modernisation is intended to increasingly allow this through offensive capabilities.

5.2 China's Nuclear Policy

As established in previous chapters, China's threat perception profoundly impacts its nuclear weapons policy and priorities attached to the modernization of the nuclear weapons program. As such, China is altering its nuclear weapons policy, expanding and modernizing its nuclear forces. China now appears to be shifting towards enhancing the flexibility of its retaliatory capability across all levels. Technical expertise and physical capabilities, once enhanced, may influence China's nuclear thinking as much as nuclear thinking has been influencing nuclear development in the past; capability may lead strategy. Historically, China's official statements and publications from military and related institutes and organizations, and Defense White Papers, have highlighted basic features of its nuclear weapons use policy, such as the limited deterrent role of nuclear weapons associated with the NFU pledge,[827] development of lean and effective nuclear forces[828] emphasizing the sufficiency of nuclear weapons,[829] and centralized[830] nuclear command and control.[831] Together these concepts form a blueprint of China's nuclear policy.

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[825] Annual Report to Congress: Military and Security Developments Involving the People's Republic of China 2021, viii

[826] Hans M. Kristensen Robert S. Norris and Matthew G. McKinzie, "Chinese Nuclear Forces and U.S. Nuclear War Planning," *The Federation Of American Scientists and The Natural Resources Defense Council*, 2006, 50

[827] Sun Xiangli, "China's Nuclear Strategy: Nature and Characteristics," *World Economics and Politics*, No. 9, (2006), 28

[828] Yao Yunzhu, "China's Perspective on Nuclear Deterrence," *Air & Space Power Journal* No. 23, No. 4, (Spring 2010), 9-11

[829] Li Bin, "Identifying China's Nuclear Strategy," *World Economics and Politics*, No. 9, (2006) 16-22

[830] Gao Yan, "From Local War under the High-Tech Conditions to the Assured Destruction under Nuclear Situation: China's Current Military Strategy should turn to the Comprehensive Nuclear Deterrence," *Tianya Forum*, July 2004, http://bbs.tianya.cn/post-worldlook-101455-1.shtml.

[831] State Council Information Office, "China's National Defense in the New Era," *White Paper*, July 24, 2019, accessed January 26, 2020, http://www.scio.gov.cn/zfbps/32832/Document/1660314/1660314.htm,

China first published a Defense White Paper in 1995. It then published additional papers every two years from 1998 to 2010. However, since 2010, China has published Defense White Papers only three times: in 2013, 2015, and recently in 2019. The 2006 and 2019 Defense White Papers are more detailed than the rest and encompass parts from other White Papers.

In 2006, for the first time, China's nuclear strategy was published in China's Defense White Paper titled *China's National Defense 2006*. It signaled China's commitment at that time to a defensive and restrained nuclear weapons doctrine and force, one that emphasized NFU and deterrence, and made no mention of the need for nuclear warfighting. The white paper under the heading of 'National Defense Policy' notes that,

> Pursuing a self-defensive nuclear strategy. China's nuclear strategy is subject to the state's nuclear policy and military strategy. Its fundamental goal is to deter other countries from using or threatening to use nuclear weapons against China. China remains firmly committed to the policy of no first use of nuclear weapons at any time and under any circumstances. It unconditionally undertakes not to use or threaten to use nuclear weapons against non-nuclear-weapon states or nuclear-weapon-free zones and stands for the comprehensive prohibition and complete elimination of nuclear weapons. China upholds the principles of counterattack in self-defense and limited development of nuclear weapons and aims at building a lean and effective nuclear force capable of meeting national security needs. It endeavours to ensure the security and reliability of its nuclear weapons and maintains a credible nuclear deterrent force. China's nuclear force is under the direct command of the Central Military Commission (CMC). China exercises great restraint in developing its nuclear force. It has never entered into and will never enter into a nuclear arms race with any other country.[832]

In the 2008 Defense White Paper, China, for the very first time, elaborated on the missile force and mission assigned to it. The Defense White Paper contains separate chapters for all services and the SAF, outlining their historical development, structure and organization, and force structure. It reiterated the thrust of the 2006 Paper, noting that China's nuclear forces are "mainly responsible for deterring other countries from using nuclear weapons against China, and for conducting nuclear counterattacks and precision strikes with conventional missiles."[833] The 2010, 2013, and 2015 Defense White Papers

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also see *China Strategic Missile Force Encyclopaedia 2012*, 10-11; and China's State Council Information Office, *China's Nuclear Defense Strategy*, Beijing, December 2006

[832] China's National Defense in 2006, "Information Office of the State Council of the People's Republic of China December 2006," Beijing, accessed January 26, 2020, https://fas.org/nuke/guide/china/doctrine/wp2006.html

[833] VII. The Second Artillery Force, China's National Defense in 2008, accessed May 22, 2021, http://www.china.org.cn/government/whitepaper/2009-01/21/content_17162838.htm

maintained a similar approach to nuclear weapons. However, the 2015 Defense White Paper did mention improvements in the force structure of the PLASAF, which appeared later in the December 2015 reforms. The most recent 2019 Defense White Paper is an amalgam of the previous ones, and notes,

> China is always committed to a nuclear policy of no first use of nuclear weapons at any time and under any circumstances, and not using or threatening to use nuclear weapons against non-nuclear-weapon states or nuclear-weapon-free zones unconditionally. China advocates the complete prohibition and thorough destruction of nuclear weapons. China does not engage in any nuclear arms race with any other country and keeps its nuclear capabilities at the minimum level required for national security. China pursues a nuclear strategy of self-defense, the goal of which is to maintain national strategic security by deterring other countries from using or threatening to use nuclear weapons against China.[834]

China's nuclear strategy of self-defense in the 2019 Paper is more precise than prior DWPs and clearer in its objective "which is to maintain national strategic security by deterring other countries from using or threatening to use nuclear weapons against China."[835] The 2019 Defense White Paper contains other significant changes; specifically, it departed from using the term "*limited development of nuclear weapons*" to now stating China will seek "*nuclear capabilities at the minimum level required for national security.*"[836] There are two important aspects to note here. The first aspect is related to material capability. The 2006 Paper focuses on the development of 'nuclear weapons' only, while the 2019 Papers focus on 'nuclear capabilities.' The latter is broader in scope and may include the capability to build miniaturized nuclear weapons for new SLBMs and ICBMs and hypersonic glide vehicles such as the DF-17. According to one official report released by China's government, and reviewed by *South China Morning Post*, China, between September 2014 to December 2017, carried out around 200 tests to simulate nuclear blasts, whereas the US did 50 from 2012 to 2017.[837] This reflects a change in the nuclear policy of China since 2014 that requires rapid simulation tests. These simulations suggest China is developing a new generation of nuclear weapons.[838]

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[834] "China's National Defense in the New Era 2019"
[835] Ibid
[836] Ibid; Information Office of the State Council of the People's Republic of China, "China's National Defense in 2006, December 29, 2006," accessed March 13, 2020, http://www.andrewerickson.com/wp-content/uploads/2019/07/China-Defense-White-Paper_2006_English-Chinese_Annotated.pdf
[837] Stephen Chen, "China Steps Up Pace In New Nuclear Arms Race with US and Russia as Experts Warn of Rising Risk of Conflict," May 28, 2018, accessed March 13, 2020, https://www.scmp.com/news/china/society/article/2147304/china-steps-pace-new-nuclear-arms-race-us-and-russia-experts-warn
[838] Ibid

The second aspect is related to the change in nuclear policy. The notion of "limited development of nuclear weapons" mentioned in the 2006 Paper was replaced with the "minimum level of nuclear capabilities" in the 2019 Paper. The change from "limited" to "minimum" capabilities is instrumental. The limited development was associated with limited means to ensure a successful retaliation – even one missile that could be successfully launched in retaliation would, therefore, be sufficient under this policy; whereas, minimum capabilities are associated with a minimum level of targets to be destroyed, which would require a certain number of targets to be destroyed, not just mere retaliation. In other words, *specific* outcomes to be achieved are linked with the minimum level of nuclear capabilities, discussed in Chapter Two.[839] Therefore, the focus of China's deterrence strategy shifted from achieving limited means to ensure a nuclear retaliation of seemingly any level to securing desired outcomes that may require a significant amount of capability. Moreover, unlike early DWPs, the 2019 DWP lacks reference to the "lean and effective" nuclear forces, a phrase that refers to the importance of a limited but effective nuclear weapons capability. This signaled that the future configuration of China's nuclear weapons capability might not be as 'limited' as it has been since the inception of the program. China's ongoing construction of three missile silo fields appears to manifest this policy change. The following section discusses the main pillars of China's nuclear weapons strategy since 2006; a critical analysis of Beijing's nuclear weapons strategy will be carried out in the following section.

5.2.1 **A Deterrent Role**

The objective of China's nuclear weapons policy appears similar to that which Mao envisioned decades before and highlighted in the Defense White Papers: to both deter the potential use of nuclear weapons against China and counter nuclear blackmail.[840] As the *Science of Military Strategy (SMS)* of 2013 states, "for a long time, China has developed and used nuclear weapons with a focus on preventing hostile countries from using or

[839] James Mulvenon, "Chinese and Mutually Assured Destruction: Is China Getting MAD?," in *Getting MAD: Nuclear Mutual Assured Destruction, Its Origins and Practice*, ed. Henry D. Sokolski (Carlisle, PA: Strategic Studies Institute (SSI) of the U.S. Army War College, November 2004), 241; Liping Xia, "China's Nuclear Doctrine: Debates and Evolution," June 30, 2016, accessed March 13, 2020, https://carnegieendowment.org/2016/06/30/china-s-nuclear-doctrine-debates-and-evolution-pub-63967; James Mulvenon et al., *Chinese Responses to U.S. Military Transformation and Implications for the Department of Defense* (Santa Monica, CA: RAND Corporation, 2006), 97

[840] Xu Weidi, "China's Security Environment and the Role of Nuclear Weapons," in Li Bin and Tong Zhao, eds., *Understanding Chinese Nuclear Thinking* (Washington, D.C.: Carnegie Endowment for International Peace, 2016) 23

threatening to use nuclear weapons against us."[841] Similarly, Sun Xiangli writes, Premier Zhou Enlai viewed,

> developing nuclear strength is chiefly to resolve the [nuclear] 'existential' problem, and the scale should not be too great; China is developing nuclear weapons to oppose the nuclear threat, not to engage in a nuclear arms race with the nuclear states.[842]

The 2013 SMS also reflects,

> At the beginning, China decided to develop nuclear weapons, aiming to break the nuclear fraud and nuclear monopoly of nuclear powers in a strategy of aggressive deterrence. Later on, the development of nuclear weapons also followed the saying 'you have, I also have' nuclear weapons. The existence of the device itself is a deterrent.[843]

This reference to the *existence of the device* highlights the efficacy of nuclear deterrence based on the mere existence of nuclear forces. In this concept, existential deterrence exists regardless of the size of the adversary's nuclear capability. This implied that even a small number of nuclear weapons that could be launched successfully in retaliation are enough to deter an adversary from a nuclear attack, a view also held by McGeorge Bundy on existential deterrence.[844] However, despite lauding the utility of existential deterrence, contradictions existed as recently as in 2013, as China began to plan and modernize nuclear weapons forces to ensure a credible retaliatory strike, given the advancement in the US capabilities.

Repeatedly, Chinese official documents emphasize that the main objective of acquiring nuclear weapons is to counter nuclear threats only. For instance, the 2013 SMS explicitly writes, "China… promised not to use or threaten to use nuclear weapons against non-nuclear-weapon states and regions. That is why we will limit the use of our nuclear forces and nuclear deterrence targets to nuclear-weapon states."[845] The 2013 SMS also emphasized that Chinese nuclear policy differentiates between its nuclear and non-nuclear roles. According to the 2013 SMS, the nuclear role is defined as using nuclear weapons for a nuclear counterattack, and non-nuclear use is defined as employing the

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[841] *The Science of Military Strategy 2013*, (战略学) Revised Edition (English Trans. Luis Ayala), (Military Strategic Research Department: Academy of Military Science, 2013) 172

[842] Quoted in Eric Heginbotham et al. *China's Evolving Nuclear Deterrent: Major Drivers and Issues for the United States* (Santa Monica, Calif.: RAND Corporation, RR-1628-AF, 2017)16

[843] *Science of Military Strategy*, 172-173

[844] McGeorge Bundy, "To Cap the Volcano," *Foreign Affairs*, Vol. 48, (October 1969) No. 1; McGeorge Bundy, *Danger and Survival: Choices About the Bomb in the First Fifty Years* (New York: Random House, 1989)

[845] *Science of Military Strategy*, 172

threat of use of nuclear weapons to deter a nuclear attack.[846] However, in relation to deterring war in general and non-nuclear use of nuclear weapons, there are some instances when some former Chinese officials have made statements on the role of nuclear weapons, stressing that they have value in deterring conventional attacks. For example, a former senior official of the PLA's Second Artillery Force (SAF), Deputy Commander Zhao Xijun, wrote in 2005 that nuclear weapons can help to deter "medium and high power conventional strikes on [China's] important strategic targets and nuclear facilities."[847] This is significant because it suggests the actual nuclear threshold may be lower than is commonly thought – nuclear weapons could be used in response to a conventional attack, not just a nuclear attack. The next chapter explains what implications a lowered nuclear threshold could have on strategic and crisis stability.

Apart from these roles, nuclear weapons also play a role in reinforcing the great power status of China. On December 31, 2015, President Xi stated that the PLA Rocket Force is a "core force of strategic deterrence, a strategic buttress to the country's position as a major power, and an important building block in upholding national security."[848] The 2013 SMS also made a similar point, declaring: "we must fully recognize that nuclear forces [have] in ensuring the status of great power to broadcast and safeguard national core interests without infringements and to create a peaceful and safe development environment."[849]

Deterrence, Escalation Control and War

Many analysts in China believe that nuclear deterrence will limit conventional conflicts from escalating to the nuclear level once it has started. If it fails to do so, nuclear deterrence will deter limited nuclear exchanges from further escalating into total nuclear war.[850] China's ongoing nuclear force modernization aims to achieve larger and advanced nuclear capabilities in rough parity to its competitors to engage in escalation control.[851] Moreover, a few specialists, such as Zhao Xijun, have written that when China's

[846] *Science of Military Strategy*, 170-172
[847] Zhao Xijun, ed., *Intimidation Warfare: A Comprehensive Discussion of Missile Deterrence* (Beijing: National Defense University Press, 2005) 41-42 quoted in Heginbotham et al., *China's Evolving Nuclear Deterrent*, 18
[848] "China inaugurates PLA Rocket Force as military reform deepens, January 2, 2016," accessed November 11, 2019, http://en.people.cn/n3/2016/0102/c90786-8998406.html
[849] *Science of Military Strategy*, 148
[850] Zhao, "Intimidation Warfare," 31-47 in Heginbotham et al., *China's Evolving Nuclear Deterrent*
[851] Brad Roberts, ed. *Taking Stock U.S: China Track 1.5 Nuclear Dialogue*, Center for Global Security Research Lawrence Livermore National Laboratory December 2020, accessed August 10, 2021, https://cgsr.llnl.gov/content/assets/docs/CGSR_US-China-Paper.pdf

adversaries plan to launch "high-tech conventional strikes or consider using nuclear weapons, they have to face the fact that the other side [China] has nuclear weapons."[852] Zhao has tried to build a case around escalation control, creating an environment where, during a war, China could guarantee it has sufficient capability to retaliate with nuclear weapons. Official sources note that employing deterrent threats requires a delicate balance to achieve desired outcomes without producing undesired consequences.[853] Maintaining such a delicate balance is imperative, as the 2013 SMS cautions that failing to ensure "the correct degree" of deterrent threat may "…have the opposite effect, and prompt escalation that could lead to a nuclear clash."[854] The correct degree to ensure a deterrent threat requires material capability, credibility to employ material capability when needed, and communicating intentions to the adversary. The 2013 SMS, while embracing the escalation control dilemma and emphasizing the proportionate response, acknowledges "we [China] must move in keeping with the enemy and not take the initiative in raising the level of nuclear confrontation between the enemy and ourselves."[855] However, this is not to say China will not escalate, in nuclear posturing and signaling, to de-escalate a conflict, but shows that they have a cautious approach towards nuclear escalation.

5.2.2 **No-First-Use (NFU)**

China's nuclear NFU is central to its nuclear weapons policy. On October 16, 1964, after testing a nuclear device, the Mao-led government of China stated, "China will not at any time or under any circumstances employ nuclear weapons first."[856] Since going nuclear, China has repeatedly reiterated its commitments to NFU, and *all* the aforementioned Defense White Papers have endorsed this policy. China's 2015 Military Strategy posits,

> China has always pursued the policy of no first use of nuclear weapons and adhered to a self-defensive nuclear strategy that is defensive in nature. China will unconditionally not use or threaten to use nuclear weapons against non-nuclear-weapon states or in nuclear-weapon-free zones…[857]

[852] Ibid
[853] *The 2013 Science of Military Strategy,* x, 141-142
[854] Ibid
[855] Ibid
[856] *China Strategic Missile Force Encyclopaedia 2012*, 11
[857] The State Council Information Office of the People's Republic of China, *China's Military Strategy 2015,* 17, accessed January 26, 2020, https://jamestown.org/wp-content/uploads/2016/07/China%E2%80%99s-Military-Strategy-2015.pdf

China's DWP of 2019 also notes that "China has always pursued a nuclear policy of not using nuclear weapons first, and unconditionally, and non-nuclear-weapon states and nuclear-weapon-free zones, or threatening to use nuclear weapons."[858] *The Strategic Missile Force Encyclopaedia* of China, released in 2012, states that "it only requires that an enemy does not employ [nuclear weapons] for China to also not employ them."[859] However, all Chinese sources, including the 2013 SMS, note that if China is attacked with nuclear weapons, China "will resolutely implement a nuclear counterstrike and carry out nuclear retaliation."[860] How China is going to respond to a non-nuclear attack on its nuclear command and control, nuclear installations, or against political leadership is not mentioned in the official documents and is, therefore, unclear. According to the SMS 2013, a conventional attack on Chinese nuclear forces would "place us in a passive position, greatly influence our nuclear retaliatory capability, and weaken the effectiveness of our nuclear deterrent."[861] Cunningham and Fravel wrote that according to some Chinese interlocutors, a conventional attack with an outcome similar to a nuclear attack – destroying China's nuclear counterattack capabilities – then China will respond with nuclear weapons. Since the NFU policy is unconditional, at least at the declaratory level, it may incentivize the US to launch pre-emptive strikes during a crisis without fearing nuclear retaliation. The US, however, is apprehensive of China's nuclear NFU policy, and questions the extent to which it actually guides nuclear policy.[862] China's development of a new missile force, early warning systems, and advanced nuclear command and control systems suggest that China has already moved to something more robust, such as a launch on warning posture.[863] The US concerns reflect that China's nuclear policy at the NFU contains some ambiguity. The 2021 DoD report on China notes,

> There is some ambiguity about conditions where Beijing's NFU policy would no longer apply; there has also been no indication that national leaders are willing to publicly attach such additions, nuances, or caveats. The PRC's lack of transparency regarding the scope and scale of its nuclear modernization program, however, raises questions regarding its future intent as it fields larger, more capable nuclear forces.[864]

[858] *China's National Defense in the New Era*, 2019
[859] *China Strategic Missile Force Encyclopaedia*, 2012
[860] *The Science of Military Strategy*, 174
[861] Ibid, 170-173
[862] "Military and Security Developments Involving the People's Republic of China, 2021," 90; "Military and Security Developments Involving the People's Republic of China: 2020," 1-37, 84-89
[863] Ibid
[864] "Military and Security Developments Involving the People's Republic of China," 2021, 90

China's strategists have also acknowledged the emerging debate inside China's strategic community about conditioning the NFU according to the nature of the target attacked in China in a first strike.[865]

5.2.3 **Lean and Effective Forces**

China's 2006 DWP was the first time Beijing used the phrase *lean and effective*, saying it "aims at building a lean and effective nuclear force capable of meeting national security needs."[866] The phrase *lean and effective* emphasizes that the nuclear forces should be *sufficient* only to launch a retaliatory strike, not to initiate a first strike. The white paper, viewing nuclear arms races as costly, also emphasizes that "China exercises great restraint in developing its nuclear force. It has never entered into and will never enter into a nuclear arms race with any other country."[867]

Along similar lines, the *2019 DWP* further adds, "… [China will keep] its nuclear capabilities at the minimum level required for national security."[868] China's PLA officers view sufficiency in this area as being able to absorb a nuclear first strike and launch a nuclear counterattack. Major General Yao Yunzhu writes, "to keep the arsenal lean, China has to exercise *restraint* in developing nuclear weapons; to keep the arsenal effective, China has to *modernize* it to ensure credibility after a first nuclear strike."[869] It is also important to note that the 2015 and 2019 Defense White Papers and 2013 SMS focused more on expanding and modernizing nuclear forces rather than maintaining limited and sufficient nuclear forces for a nuclear counterattack.

Likewise, the 2013 SMS posits,

> At present, the construction and development of nuclear power should improve nuclear weapons system. The core level of informatization [use of new communication technologies] is to strengthen command and control, strategic early warning, and rapid response capacity building. Continuously enhance the penetration ability, protection survivability, and rapid response capability under the condition of informatization with regard to mobility, etc., efforts are made to increase the credibility of nuclear deterrence.[870]

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[865] Ibid, 90-91
[866] *China's National Defense in 2006*
[867] Ibid
[868] *China's National Defense in the New Era*, 2019
[869] Yao Yunzhu, "China's Perspective on Nuclear Deterrence," *Air & Space Power Journal*, Vol. 24, No. 1, (Spring 2010), 27-31
[870] *The Science of Military Strategy*, 148

Similarly, the 2015 DWP notes, "China will optimize its nuclear force structure, improve strategic early warning, command and control, missile penetration, rapid reaction, and survivability and protection, and deter other countries from using or threatening to use nuclear weapons against China."[871] The 2019 DWP mentions 'lean' at two points, with no reference to the nuclear force.[872] However, the 2019 DWP outlines a thorough plan for improvements, noting,

> The People's Liberation Army's Rocket Force is enhancing its credible and reliable capabilities of nuclear deterrence and counterattack, strengthening intermediate and long-range precision strike forces, and enhancing strategic counter-balance capability, so as to build a strong and modernized rocket force… PLA Air Force (PLAAF) is improving its capabilities for strategic early warning… air and missile defense, information countermeasures…[873]

The force modernization referenced above is necessary to maintain a lean and effective force, compelled by China's changing strategic environment and US nuclear and conventional strategic capabilities advancements. The consistency in rhetoric, through which China discusses its force modernization, does not assure that there will be no change in China's nuclear forces' lean and effective posture in the future, or that the change is not underway right now.[874] Indeed, there appears to be a change in the posture underway as China moves away from what was required to preserve lean and effective forces capability, as discussed below.[875] China's policymakers have never explicitly qualified what level of destruction a retaliatory strike must achieve as it relates to the concept of '*sufficiency*'. This suggests China's nuclear policy maintains another level of ambiguity regarding what nuclear force is necessary and what amount of destruction of the adversary is necessary, perhaps responding to its changing capabilities and the offensive and defensive capabilities of adversaries. Achieving sufficient destruction of the adversary during a conflict could be destabilizing, lead to crisis escalation, and engage

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[871] *China's Military Strategy,* The State Council Information Office of the People's Republic of China May 2015, Beijing, accessed January 26, 2020, https://jamestown.org/wp-content/uploads/2016/07/China%E2%80%99s-Military-Strategy-2015.pdf

[872] At first point, the term is used with reference to PLA, that " the PLA has established a lean and efficient joint operations command system composed of permanent and specialized commanding establishments for both peacetime and wartime operations." And at second point, the term is used with reference to "combat-oriented modern logistics system joint." *China's National Defense in the New Era, 2019*

[873] *China's National Defense in the New Era*, 2019

[874] Xiangli, "Strategic Choice in the Nuclear Age," 187

[875] Fiona Cunningham and M. Taylor Fravel, "Assuring Assured Retaliation: China's Nuclear Posture and U.S.-China Strategic Stability," *International Security*, Vol. 40, No. 2, (2015) 7-50; M. Taylor Fravel and Evan S. Medeiros, "China's Search for Assured Retaliation: The Evolution of Chinese Nuclear Strategy and Force Structure," *International Security*, Vol. 35, No. 2, (2010), 48-87

other states in the nuclear arms race during peacetime, as discussed in Chapters Six and Seven.

5.2.4 **Centralized Command and Control**

China's official documents suggest that it has a highly centralized nuclear command, control, and communication (NC3) system. The power of strategic decisions rests with the top political and military authorities.[876] The 2006 White Paper maintains that "China's nuclear force is under the direct command of the Central Military Commission (CMC)."[877] Moreover, the 2013 SMS stresses that,

> The Central and Central Military Commission [CMC] directly leads the masters [of] the Second Artillery Force [now Rocket Force] Construction, Development and Operation. Problem and major activities are directly determined by the Party Central Committee and the CMC.[878]

Since 1964, China's NC3 systems have been designed to ensure land-based counter-nuclear strikes could be launched, with the intention of maintaining deterrence stability. China connects two main objectives to the NC3 system: firstly, to maintain political control and secure nuclear weapons from inadvertent or unauthorized use, and secondly, to ensure its survivability, protecting it from external attack.[879] China's existing early warning systems are based on ground radars. However, these systems are gradually becoming more advanced and sophisticated with Russian technical assistance. [880] According to some reports, a China-Russia joint missile attack early warning system is near completion. It is based on Russian satellites and ground-based radars set up in China's strategic locations.[881] The system is designed to gather advanced information on missile trajectory, speed and time to hit the target, and other related information required

[876] Chong-Pin Lin, *China's Nuclear Weapons Strategy: Tradition Within Evolution*, (Lanham, Md.: Lexington Books, 1988), 91
[877] *China's National Defense* in 2006
[878] *The Science of Military Strategy*, 2013, 228
[879] Fiona Cunningham, "Nuclear Command, Control, And Communications Systems Of The People's Republic Of China," NAPSNet Special Reports, July 18, 2019, accessed January 28, 2020, https://nautilus.org/napsnet/napsnet-special-reports/nuclear-command-control-and-communications-systems-of-the-peoples-republic-of-china/
[880] Ibid
[881] Alexander Korolev, "China-Russia cooperation on missile attack early warning systems," *East Asia Forum*, November 20, 2020, accessed January 7, 2021, https://www.eastasiaforum.org/2020/11/20/china-russia-cooperation-on-missile-attack-early-warning-systems/; Vassily Kashin, "Tacit Alliance: Russia and China take Military Partnership to New Level," *Carnegie Moscow*, October 22, 20219, accessed December 26, 2020, https://carnegiemoscow.org/commentary/80136; Alexander Korolev, "How closely aligned are China and Russia? Measuring strategic cooperation in IR," *International Politics*, Vol. 57, (2020), 760-789

for successful interception.[882] Such a level of strategic cooperation and technical integration of strategic systems is analogous to the US-UK and the US-Japan strategic cooperation and systems integration.

Nevertheless, little exists in the literature on NC3 provisions for its air-based and nascent sea-based nuclear deterrent. To address this, a detailed examination of NC3 is carried out in a later section to provide some insight. The next section briefly discusses China's understanding of nuclear deterrence and nuclear strategy to set up the inquiry that takes place in the subsequent section.

5.3 China's Understanding of Nuclear Deterrence and Nuclear Strategy

According to China's 2006 White Paper, "China's nuclear strategy is subject to the state's nuclear policy and military strategy."[883] The 2013 SMS notes, "as a military strategy, the Second Artillery Strategy is subordinate to the military strategy while accepting the nuclear policy, nuclear warfare guidance and constraints."[884] China maintains secrecy, ambiguity, and opacity when it comes to its nuclear strategy, however, in official documents, it does publish some campaign and operational level information. China's land-based nuclear force has maintained a primary position in its nuclear strategy. Historically, the role of China's Air Force and Navy in nuclear strategy has remained limited; however, according to the 2019 White Paper, it is expanding now.[885] The chapter now considers the role of the PLA Air Force, PLA Navy, and PLA Rocket Force in China's nuclear deterrence and strategy.

5.3.1 PLA Air Force (PLAAF)

The emerging role of the PLA Navy in China's nuclear weapons strategy may motivate and perhaps pressure the PLAAF to reacquire a more significant role for itself. The PLAAF is striving for the role of a 'strategic air force'.[886] China employed at least 12 air-delivered nuclear weapons during nuclear tests from 1965 to 1979. Since then, according to the US DoD 2017 report, the "People's Liberation Army Air Force does not currently

[882] Korolev, "China-Russia cooperation on missile attack early warning systems; Kashin, Tacit Alliance: Russia and China take Military Partnership to New Level"; Korolev, "How closely aligned are China and Russia?" 760-789
[883] *China's National Defense in 2006*
[884] *The 2013 Science of Military Strategy*, 228
[885] *China's National Defense in the New Era*, 2019
[886] Michael S. Chase and Cristina L. Garafola, "China's Search for a Strategic Air Force," *Journal of Strategic Studies*, Vol. 39, No. 1, (2016)

have a nuclear mission."[887] However, its 2018 version states that "the PLAAF has been newly re-assigned a nuclear mission."[888] The 2021 report notes that PLAAF has improved its combat effectiveness.[889] *The Bulletin of Atomic Scientists* (BAS) 2021 report on China's nuclear forces states that China operates 20 medium-range strategic bombers with a nuclear role.[890] Currently, the PLAAF is upgrading medium-range strategic bomber H-6N (Navy) - a variant H-6 and working on developing H-20, a successor to the H-6 bomber.[891] The nuclear-capable stealth H-20 bomber is expected to enter into service by 2025, and it is likely to be equipped with nuclear cruise missiles.[892] The Y-20 heavy transport military aircraft is also under production and will eventually replace the H-6. However, the PLAN has extended the H-6(K) range by fielding CJ-10s – air-launched cruise missiles with a range of 2,000km.[893] A miniaturized nuclear payload could be mated with CJ-10, but that would require policy change introducing the TNWs to the PLAAF. Given the emerging role of the PLAN, the PLA in the future may seek to develop a large and independent PLAAF with a nuclear role.

5.3.2 **PLA Navy (PLAN)**

Alfred Mahan, the famous American naval strategist, argued in 1949 that the nation with the most powerful navy would control the world.[894] His argument, viewed as the first order of strategic thinking in naval warfare, is still highly relevant and has been the driver of the US' naval strategy since 1945.[895] According to some US analysts, China's global ambitions to project power, as per Mahan, would require China to try to dominate sea-lanes of communications (SLOC) and control world trade[896] hence, fulfilling a

[887] Annual Report to Congress: "Military and Security Developments involving the People's Republic of China 2017," 61
[888] Annual Report to Congress: "Military and Security Developments involving the People's Republic of China 2018," 75
[889] Annual Report to Congress: "Military and Security Developments involving the People's Republic of China 2021," 71
[890] Kristensen and Korda, "Nuclear Notebook: Chinese Nuclear Forces, 2021"
[891] "Chapter Six: Asia," *The Military Balance 2019*, (London, IISS, 2019), Vol. 119, No. 1, 222-319
[892] Kristensen and Korda, "Nuclear Notebook: Chinese Nuclear Forces, 2021"
[893] Office of the Secretary of Defense, "Military Power of the People's Republic of China," Department of Defense Annual Report to Congress, 2008, 56
[894] Alfred Mahan, *Interest of America in Sea Power: Present and Future* (Boston: Little, Brown, and Company, 1897)
[895] Ibid, 3-31
[896] James McBride and Andrew Chatzky, "Is 'Made in China 2025' a Threat to Global Trade?" *CFR*, May 13, 2019, accessed May 25, 2021, https://www.cfr.org/backgrounder/made-china-2025-threat-global-trade; John Mauldin, "China's Grand Plan To Take Over The World," *Forbes*, November 12, 2019, accessed May 24, 2021, https://www.forbes.com/sites/johnmauldin/2019/11/12/chinas-grand-plan-to-take-over-the-world/?sh=28a7e8895ab5; Karl Claxton, "China's Sea Lines of Communication: Implications for the South Pacific?" *Australian Strategic Policy Institute*, February 21, 2014, accessed May 13, 2020,

prerequisite for super status and world influence, and in-line with Mahan's analysis. The systematic development of China's blue water navy signals that the PLA Navy, in turn, is undergoing an institutional change towards a more significant role in terms of nuclear deterrence and counterattack campaigns. China's 2019 White Paper, while highlighting the change in the institutional role of the PLAN notes,

> In line with the strategic requirements of near seas defense and far seas protection, the PLAN is speeding up the transition of its tasks from defense on the near seas to protection missions on the far seas, and improving its capabilities for strategic deterrence and counterattack, maritime maneuver operations, maritime joint operations, comprehensive defense, and integrated support, so as to build a strong and modernized naval force.[897]

The change in the role of the PLAN was announced in the 2015 White Paper, under the heading of 'force development in critical security domains,' which posits,

> The seas and oceans bear on the enduring peace, lasting stability and sustainable development of China. The traditional mentality that land outweighs sea must be abandoned, and great importance has to be attached to managing the seas and oceans and protecting maritime rights and interests. It is necessary for China to develop a modern maritime military force structure commensurate with its national security and development interests, safeguard its national sovereignty and maritime rights and interests, protect the security of strategic SLOCs and overseas interests, and participate in international maritime cooperation, so as to provide strategic support for building itself into a maritime power.[898]

Such systemic developments in the PLAN and focus on the maritime domain is likely to have manifold implications for the PLAN nuclear forces. The increasing importance and augmented role of the PLAN reflect the change underway in China's political and strategic thinking. Historically, the PLAN played a role secondary to the PLARF China's nuclear weapons use doctrine; however, the reliance on the PLARF for future deterrence and nuclear counterattack operations is likely to decrease as the PLAN is modernizing and increasing the number of SSBNs and SLBMs.

Since 2010, the PLAN has enhanced its sea-based deterrent capabilities, which is partly aimed at ensuring the survivability of its nuclear forces. Historically, China's Xia-class

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https://www.aspistrategist.org.au/chinas-sea-lines-of-communication-implications-for-the-south-pacific/; Donald K. Emmerson, "Why Does China Want to Control the South China Sea?" *The Diplomat*, May 24, 2016, accessed September 28, 2019, https://thediplomat.com/2016/05/why-does-china-want-to-control-the-south-china-sea/

[897] State Council Information Office, 2019

[898] State Council Information Office, 2015

SSBN never undertook deterrent patrols.[899] However, with Jin-class SSBN (Type-094) and JL-2 SLBMs, China's sea-based nuclear deterrent capability is maturing.[900] In December 2015, according to US officials, the Jin-class SSBN made its maiden deterrent patrol for 95 days, far from Chinese waters.[901] Such patrols will provide China with a credible sea-based nuclear deterrent, an outcome viewed as indispensable by China because of the greater survivability and capability it allows to launch missiles along multiple trajectories while staying away from the adversary's missile defenses.[902] These developments will undoubtedly have implications for the political and military leadership of China, which will need to grapple with issues pertinent to maintaining command and control, the delegation of power, technical issues related to the SSBN force, and the level of readiness of nuclear weapons, to mention a few.

The PLAN had only one (Type 93) SSBN for most of its history, commissioned in the late 1980s; however, it conducted no patrols. Perhaps because of safety and reliability issues.[903] Therefore, scarcely anyone in the PLAN has significant experience with handling SSBNs and related nuclear affairs, as surface-warfare officers dominated the PLAN.[904] A detailed discussion on these and other related challenges is in the section below that deals with force modernization. To briefly mention here, in the short term, these policy issues and technical challenges are likely to impede the PLAN's ability to formulate a well-articulated sea-based nuclear deterrence strategy. However, China's strategic collaboration with Russia could be helpful for China to overcome such shortcomings. Currently, China and Russia are working on a joint non-nuclear advance submarine project.[905] Russia has recently provided China with a Kilo-class attack

[899] Christian Conroy, "China's Ballistic-Missile Submarines: How Dangerous?" *The Diplomat*, November 18, 2013, http://nationalinterest.org/commentary/chinas-ballistic-missile-submarines-how-dangerous-9414

[900] Hans M. Kristensen and Matt Korda, "Chinese Nuclear Forces, 2019," *Bulletin of the Atomic Scientists 2019*, Vol. 75, No. 4, (2019) 1751-176

[901] Richard D. Fisher, Jr., "China Advances Sea- and Land-Based Nuclear Deterrent Capabilities," *IHS Jane's 360*, December 15, 2015; Kristensen and Korda, "Chinese Nuclear Forces, 2020," *Bulletin of the Atomic Scientists 2020*, Vol. 76, No. 6, (2020) 452

[902] Office of Secretary of Defense (OSD), *Annual Report to Congress: The Military Power of the People's Republic of China*, Washington, D.C.: U.S. Department of Defense, 2016, 26, accessed February 8, 2020, https://dod.defense.gov/Portals/1/Documents/pubs/2016%20China%20Military%20Power%20Report.pdf

[903] Tong Zhao, "Tide of Change: China's Nuclear Ballistic Missile Submarines and Strategic Stability," *CEIP*, 2018), 7-8; Hans M. Kristensen, Robert S. Norris, and Matthew G. McKinzie, *Chinese Nuclear Forces and U.S. Nuclear War Planning* (Washington DC: Federation of American Scientists/ Natural Resources Defense Council, 2006), 80

[904] Eric Heginbotham et al., "China's Evolving Nuclear Deterrent," 109-110

[905] Dave Makichuk, "New China, Russia Sub Project puzzles Analysts," *Asia Times*, August 29, 2020, accessed January 7, 2022, https://asiatimes.com/2020/08/new-china-russia-sub-project-puzzles-analysts/

submarine.[906] There is a historical precedent for cooperation in this area given Russia helped China build its submarine industry in the late 1950s. Russia shared the plans to build a Golf-class ballistic missile submarine and Romeo-class attack submarine during the Cold War.[907]

5.3.3 **PLA Rocket Force (PLARF)**

The PLARF, earlier known as the PLA Second Artillery Force (PLASAF), was established in 1966. It made its first public debut during China's National Day parade in October 1984. In PLA official discussions, the PLARF used to be listed with other services. The PLARF operates both conventional and nuclear missile forces. The campaign commander heads the conventional missile force in the chain of command, but the CMC directly commands the nuclear missile force. The ultimate power to authorize the use of nuclear weapons is "subject to the unified command of the Central Military Commission. Only the commission's chairman… has the power to issue an order to use such weapons after top leaders reach a consensus on the issue." [908] However, in a wartime scenario, a 'skip echelon' mechanism might be employed, wherein the CMC would assume direct command and communicate with launch bases.[909] It might be done for quick implementation of nuclear employment orders after losing a majority of the nuclear weapons or force to an adversary's first disarming strike.

The CMC also reserves the sole right to set the alertness level of the RF. The RF has three readiness levels: the third level is peacetime circumstance; the second is a warning during which forces are placed in a preparatory position; and the first is referred to as ready-to-launch on order.[910] Since 2004, due to the increasing strategic importance of the PLASAF, its commander's position was elevated to becoming a member of the CMC like other PLA services.[911] Also, the officers of the PLARF are now being promoted as per the standards

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[906] H I Sutton, "China and Russia in Mysterious New Submarine Project," *Forbes,* August 27, 2020, accessed August 11, 2021, https://www.forbes.com/sites/hisutton/2020/08/27/china-and-russia-in-mysterious-new-submarine-project/?sh=157f15691629

[907] Ibid

[908] Mark A. Stokes, "Chinese Ballistic Missile Forces in the Age of Global Missile Defense: Challenges and Responses," in Andrew Scobell and Larry M. Wortzel, eds., *China's Growing Military Power: Perspectives on Security, Ballistic Missiles, and Conventional Capabilities*, (Carlisle, Pa.: Strategic Studies Institute, U.S. Army War College, 2002) 24-27

[909] Bates Gill, James Mulvenon, and Mark Stokes, "The Chinese Second Artillery Corps: Transition to Credible Deterrence," in James C. Mulvenon and Andrew N. D. Yang, eds., *The People's Liberation Army as Organization: Reference Volume v1.0* (Santa Monica, Calif.: RAND Corporation, CF182-NSRD, 2002)

[910] Wortzel, 2007, 20

[911] James Mulvenon, "The King Is Dead! Long Live the King! The CMC Leadership Transition from Jiang to Hu," *China Leadership Monitor*, Vol. 13, (2005), 1-8

of other services; earlier PLASAF officers' promotions were not based on PLA general standard procedures.[912] The intra-service transfers of personnel, from conventional missiles to nuclear missile commands, are also now routine matters in the PLARF.[913]

The reforms introduced by President Xi Jinping towards the end of 2015 led the PLASAF to being elevated from a military branch to a full service and renamed the PLA Rocket Force. These reforms were not explicitly related to nuclear and conventional missile forces. Many analysts have overlooked other simultaneous developments such as the creation of the Strategic Support Force (SSF) that "centralizes most PLA space, cyber, electronic, and psychological warfare capabilities."[914] According to one RAND study, the RF had been arguing for years for a "separate space component within the PLA:" however, the PLAAF had tried to keep it within its domain.[915] The creation of the SSF shows that the PLASAF narrative has prevailed over the PLAAF, and in addition, the top leadership of the newly built SSF were former officers of the PLASAF, who are likely to align the PLASSF with the RF.[916] According to some analysts, "PLARF will command all three legs of China's nuclear triad-ballistic missiles, nuclear-capable bombers, and submarines."[917] If this transformation occurs successfully, the PLARF would be the only military service in the world controlling an entire nation's nuclear triad. Moreover, one can speculate that the PLARF might also gain command over China's BMD system and counter-space forces, as both domains require and employ modified ballistic missiles.[918]

5.3.4 **PLARF Developments and Strategy**

Until the mid-1980s, the PLASAF nuclear portfolio was comprised mainly of medium and intermediate-range nuclear-capable ballistic missiles and nuclear warheads. It had

[912] Mark A. Stokes and L. C. Russell Hsiao, "Leadership Transitions in the Second Artillery Force at the 18th Party Congress: Implications for Roles and Missions," *Asia Eye Blog*, May 7, 2012
[913] Michael S. Chase and Daniel Yoon, "Like Arrows on the Bent Bow: Nuclear and Conventional Capabilities of China's Second Artillery Force," *Conference Paper*, (Washington, D.C., 2012), 51–55; OSD, *Annual Report to Congress: The Military Power of the People's Republic of China*, (Washington, D.C.: U.S. Department of Defense, 2005), 25-30
[914] John Costello and Joe McReynolds, *China's Strategic Support Force: A Force for a New Era* (Washington D.C., US Government Publishing Office, 2018) 1
[915] Eric Heginbotham et al., 112
[916] Ibid., 110-115
[917] Kelsey Davenport, "China Elevates Nuclear Rocket Force," *Arms Control Association*, March 2016, accessed February 10, 2020, https://www.armscontrol.org/act/2016-03/news/china-elevates-nuclear-rocket-force
[918] Ibid

few ICBMs and no conventional missiles.[919] China issued a new operationalizing doctrine of "Dual Deterrence and Dual Operations" for the PLASAF in the mid-1980s for employing conventional missile forces in addition to the nuclear missile force.[920] The first conventional missile unit was established in 1993 within the then-solely nuclear Second Artillery Force.[921] The logic for this doctrine was that the commingling of conventional and nuclear missile forces would better help deter China's potential adversaries.

Later in 2004, the CMC published a doctrine, "Science of Second Artillery Campaigns (SSAC)."[922] The purpose was to maintain both a conventional response capacity and a nuclear deterrent. The doctrine is by far the most detailed document describing the missile force strategy and goals, and notes,

> In the late 1980s, the Central Military Commission assigned the Second Artillery Force the mission to build and develop a conventional guided missile force. Especially after the Gulf War, the PLA, under the correct leadership of President Jiang Zemin, formulated the military strategic guidelines of the new era. To meet the needs of future high-tech local wars, the Central Military Commission issued the new task of 'dual deterrence and dual operations' and set up a new conventional guided missile force.[923]

The new doctrine required doctrinal and practical modification in the PLASAF. The 2004 SSAC indicated that some changes had to take place, such as,

> First is to shift the footing of the theoretical research of Second Artillery Force campaigns from dealing with a nuclear war in the past to participating in a high tech local war under the condition of nuclear deterrence; Second is to shift the focus of the research from using the single nuclear means to accomplish the mission of nuclear counter attack in the past to using two types of means, both nuclear and conventional, namely to a mission of 'dual deterrence and dual operations.' Third is to change the content of research from focusing on strategizing in the past to focusing on a combined use of strategizing and technical means.[924]

The doctrine of dual deterrence and dual operations was compatible with the Local Wars concept adopted in 1993. The concept sought to put a premium on developing a

[919] Anthony H. Cordesman and Joseph Kendall, *Chinese Strategy and Military Modernization in 2016: A Comparative Analysis* (Center for Strategic and International Studies, 2016), 377-426
[920] People's Liberation Army Second Artillery Force, *Science of Second Artillery Campaigns*, (Beijing: PLA Press, 2004), 37
[921] Fiona S. Cunningham and M. Taylor Fravel, "Dangerous Confidence? Chinese Views on Nuclear Escalation," *International Security*, Vol. 44, No. 2, (2019), 61-109
[922] *Science of Second Artillery Campaigns*, 12-14
[923] *Science of Second Artillery Campaigns*, 13
[924] Ibid., 37

conventional strike capability to carry out long-range precision strikes.[925] The PLARF now had a significant supporting role for all three services of the PLA for joint operations. China maintains no clear separation between the conventional and nuclear domains of the PLARF. Indeed, the 2004 SSAC emphasized that "nuclear missile force deterrence actions and conventional missile strike operations must be fused together and mutually interwoven."[926] Though China claims that only conventional missiles shall be part of any potential non-nuclear campaigns, nuclear missiles will play the role of nuclear deterrence and escalation control as a backstop. As the 2004 SSAC states,

> These units aim mainly to fully demonstrate their role in nuclear deterrence and prevent the war from moving towards widening or spreading, and to deter the enemy from initiating nuclear war, and thereby controlling the war by keeping it localized, limited and bearable in scope.[927]

The commingling of conventional and nuclear missile forces could have profound implications for crisis stability and escalation; the dual roles attached to missiles to protect both forces and manipulate the risk of nuclear escalation by creating confusion and deception around the missile force.[928] The comingling of missile forces could have severe implications for the US. If the missile force is used against US assets, it could be difficult for the US to identify in a limited time whether the incoming missile has a nuclear or conventional payload. Thus, a potential miscalculation may lead to nuclear escalation and war.[929] For Chinese policymakers, the perceived benefits of the comingling, such as increasing the survivability of a relatively small nuclear missiles force or increasing fear of escalation after an adversary's advertent or inadvertent attack on China's nuclear missile force or command and control, outweigh the perceived cost, that is, fighting a war without a credible nuclear missile force. The commingling brings more options between

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[925] John W. Lewis and Xue Litai, "Making China's Nuclear War Plan," *Bulletin of the Atomic Scientists*, Vol. 68, No. 5, (2012) 60-62

[926] People's Liberation Army Second Artillery Force, *Science of Second Artillery Campaigns*, (Beijing: PLA Press, 2004), 90-91, quoted in Roy Kamphausen, David Lai, Travis Tanner, *Assessing the People's Liberation Army in the Hu Jintao Era*, (US Army War College Press: Carlisle Barracks, PA): 2014, 320, available at https://www.hsdl.org/?abstract&did=753205

[927] Ibid., 309

[928] Zhao Tong and Li Bin, "The Underappreciated Risks of Entanglement: A Chinese Perspective," in James M. Acton, ed. *Entanglement: Russian and Chinese Perspectives on Non-Nuclear Weapons and Nuclear Risks* (Washington, D.C.: Carnegie Endowment for International Peace, 2017), 47-76

[929] Thomas Christensen, "The Meaning of the Nuclear Evolution: China's Strategic Modernization and U.S.-China Security Relations," *Journal of Strategic Studies*, Vol. 35, No. 4, (2012) 469-471; Eric Heginbotham et al., *China's Evolving Nuclear Deterrent: Major Drivers and Issues for the United States*, (Santa Monica, Calif.: RAND Corporation, 2017), 155-158; Joshua Rovner, "Two Kinds of Catastrophe: Nuclear Escalation and Protracted War in Asia," *Journal of Strategic Studies*, Vol. 40, No. 5, (2017), 9-11

conventional and nuclear payloads for dual-capable missiles, making it easy to act and tailor responses according to the nature of the threat. Moreover, entanglement could also be a cost-cutting measure and add to strategic ambiguity. Instead of having separate conventional and nuclear missile brigades and units, joint brigades and units certainly reduce costs. Therefore, for the Chinese leadership, the ambiguity through commingling is to be exploited instead of being viewed as a potential source of escalation.

5.3.5 Roles Assigned to PLA Rocket Force (PLARF)

The 2013 SMS identifies four primary tasks for the PLARF. The first is associated with the strategic positioning of the RF, and the second is based on the strategic tasks assigned to it. The third is linked with the construction and development of the RF, and the last deals with its strategic use.[930]

5.3.5.1 Strategic Positioning of the Rocket Force

The PLARF is based on both land-based nuclear-capable strategic and conventional missiles. The RF is the principal force responsible for China's strategic deterrence. It comes under the direct control of the Party's Central Committee (CC) and the Central Military Commission (CMC). According to the 2013 SMS, the strategic missiles of the RF will be "used for war and national security."[931] The RF has centralized command, and operational activities are strictly controlled. The CC and the CMC directly control the construction, development, and operations of the RF. The PLARF is central in curbing "large-scale wars and effectively counteracting major strategic opponents."[932] Apart from nuclear campaigns, the RF is responsible for long-range conventional missile strikes. China regards conventional missiles as its primary battle weapons. It is committed to improving the range and combat capability significantly and diversifying its platforms.[933] Drawing from this strategic position, the RF is also crucial for developing China's military combat capability because conventional missile technology is similar to the technology used to develop and launch space vehicles and satellite-kill vehicles; a

[930] *The Science of Military Strategy* 2013, 228-236
[931] *The Science of Military Strategy* 2013, 228
[932] Ibid., 29
[933] China Power Team. "How are China's Land-based Conventional Missile Forces Evolving?" *China Power*. September 21, 2020. Updated May 12, 2021. Accessed August 11, 2021. https://chinapower.csis.org/conventional-missiles/

capability that is taking on increasing importance given the increasing attention to space as a key domain of contemporary and future warfighting.[934]

5.3.5.2 Strategic Tasks of the PLARF

The fluid nature of China's national interest has kept the strategic objectives of the PLARF dynamic. Initially, the PLARF or the RF was established under the threat of nuclear weapon use against China by the US during the Korean War and the Cross-Strait Crises. Now the primary objective of the RF is to "master the use of missiles and nuclear weapons as soon as possible to form a verifiable war [and] acquire an ability to break the nuclear monopoly of the nuclear weapons and oppose the nuclear deterrence of the nuclear weapons."[935] During the early period after nuclearization, from the mid-1960s to mid-1980s, the objective was to prepare for "early, large-scale and nuclear war."[936] The aim was to prepare China for a large-scale war that would begin with a nuclear attack and counter-attack. For conventional deterrence operations, the conventional missile division was formed in the early 1990s, and later conventional missiles became an integral part of the Second Artillery missions.[937]

The RF, to defend national security, now aims to use nuclear weapons to implement active self-defense via counter-attack after being attacked by the adversary with nuclear weapons.[938] The change in PLARF's objective from fighting an early, large-scale, and nuclear war to pursuing active self-defense via counter-attack suggests that China's leadership during the Deng regime did not expect a nuclear attack in the initial stages of war. This reflects that during the mid-1980s, China's strategic missile force capabilities improved, its confidence in deterrence increased, and the PLARF played an important role in deterrence and active defense strategy.[939] The RF now aims to stop the adversary "from using nuclear and conventional precision weapons" by implementing strategic nuclear counter-attacks and conventional missile precision strikes, hence establishing deterrence by making the threat to retaliate more credible.[940] The 2013 SMS writes,

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[934] Jeff Becker, "When It comes to Missiles, Don't copy Russia and China: Leapfrog Them," *War on the Rocks*, June 30, 2020, accessed August 11, 2021, https://warontherocks.com/2020/06/when-it-comes-to-missiles-dont-copy-russia-and-china-leapfrog-them/
[935] *The Science of Military Strategy* 2013, 230
[936] Alastair Iain Johnston, "China's New 'Old Thinking': The Concept of Limited Deterrence," *International Security* Vol. 20, No. 3, (1995/1996), 9
[937] Ron Christman, "Conventional Missions for China's Second Artillery Corps," *Comparative Strategy*, Vol. 30, No. 3, (2011), 199
[938] *The Science of Military Strategy* 2013, 169-228
[939] Ibid
[940] *The Science of Military Strategy* 2013, 228-235

"when threatened, the superior destructive power of nuclear weapons determines the deterrent effect of nuclear forces."[941] The force is also tasked to safeguard "world peace and promote common development," and it should focus on the "pillars that embody China's international status, and establish a big country's image and performance," which is otherwise considered to be difficult to achieve with other types of weapons because nuclear missile forces are capable of striking distant targets with immense destructive power and these missiles reflect the state's advanced technological prowess.[942] Another task associated with the RF is to provide a secure environment by effectively responding to the threats and challenges for building an affluent society and extending strategic opportunities for China's development.[943]

5.3.5.3 Construction and Development of the Rocket Force

The third role is related to the tangible and intangible development of the PLARF. Since the RF includes nuclear-capable missiles, conventional missiles, and nuclear weapons, coordination and cooperation between all realms of the RF are imperative. Moreover, the expanding strategic interests and new warfare methods on the ground, in space and digital networks, which are becoming increasingly fierce, is also one of the roles of the PLARF.[944] The RF also aims to increase the efficacy of the counter-attacks as it directly impacts the credibility of China's nuclear deterrence. Other roles include strategic planning, involving new target selection, increasing the number and improving missile ranges, and effectively preserving the nuclear forces to survive a nuclear attack and the capacity to penetrate adversaries' defenses.[945] Another, but indirect, role of the RF is strengthening the supporting construction for successfully carrying out effective nuclear counterattacks to secure the predetermined objectives. After absorbing a first nuclear strike, the overall environment for the nuclear retaliatory strike is expected to be complex, uncertain, and restricted.[946] It requires the construction of a robust supporting system to measure the impact of a nuclear strike. Lastly, the role of the RF regarding the construction and development of future joint operations is considered crucial by the CMC.

[941] Ibid., 231
[942] Ibid., 230-231
[943] Ibid., 231
[944] Ibid
[945] Ibid., 232-232
[946] Ibid

The joint operations under the condition of informatization must exploit the uniqueness of combined military forces and capability.[947]

5.3.5.4 Strategic Use of the PLARF

The RF is responsible for implementing China's nuclear policy and making nuclear and military strategies, and is mandated to implement deterrence and counter nuclear attacks. However, the power to decide the goals to be achieved, the method for ensuring deterrence, and other nuclear-related issues rest with the CMC. The RF is also mandated with undertaking conventional missile strategic and tactical operations under the guidance of the CMC. The 2013 SMS notes that during a nuclear attack, China's "entire strategic actions [will be placed] in a special state. So, in the threat of nuclear retaliation, nuclear counterattack, politics, economic, diplomatic and other fields should also cooperate to demonstrate firm resolve to implement nuclear counterattack." [948] As for China, deterrence is an approach involving all national dimensions that would make deterrence credible. The official documents say that the RF should work in close collaboration with conventional missile forces and sea-based nuclear deterrence to capitalize on joint operations under a nuclear attack. This highlights the importance of PLARF in joint nuclear operations. The 2013 SMS, however, accepts that the need to enact a nuclear retaliatory strike would reveal the failure of nuclear deterrence. The documents also note that "the conventional missiles" could be used to help pre-empt "the enemy's reconnaissance and early warning systems, electronic countermeasures system, and air defense anti-missile array" and in specific conditions would strike adversaries "space networks such as military satellites."[949]

The four different roles associated with the RF, the strategic positioning of the RF, the strategic tasks assigned to it, the construction and development of the RF, and lastly, the RF strategic use, provide insights into China's view of the PLA Rocket Force and its integrated national strategy to implement deterrence. [950] They highlight the RF's evolving approach to conventional and nuclear deterrence and operations.

A critical examination of the above-mentioned roles assigned to the PLARF shows that although the Rocket Force was initially linked to purely defensive objectives it has also

[947] *The Science of Military Strategy,* 2013, 232-2345
[948] Ibid., 235
[949] Ibid., 236
[950] *The Science of Military Strategy* 2013, 228-236

assumed offensive roles. For instance, the addition of conventional precision missile, if used with a nuclear payload, could have immense consequences for strategic stability because it would enable China to downgrade its adversary's nuclear and conventional command and control situational awareness via Command and Control (C2) destruction, compelling it to employ nuclear weapons early in the conflict.[951] This crossover between the nuclear and conventional missile forces has grown in both realms, personnel training programs, and new advancements in missile technologies. It is also reported that China jointly operates conventional and nuclear C2 centers.[952] In the case of a decapitation attack, whether conventional or via a cyberattack intended to hit conventional C2, it could unintentionally target nuclear C2. Such an attack could lead China to use nuclear weapons before losing them, leading to crisis escalation. Moreover, a missile launched from the missile unit hosting both conventional and nuclear-capable missiles could put the adversary in a situation where it may not calculate whether the incoming missile holds a nuclear warhead. This way, China may invite a nuclear strike with unintended consequences.

Additionally, the advances in hypersonic, high-precision and boost-glide vehicles give China the capability to conduct more than conventional precision attacks; it could allow it to penetrate missile defense systems in pre-emptive strikes, discussed in detail in the next chapter.[953] Under such circumstances, China's construction of new silo fields supports an argument suggesting China's NFU policy is increasingly out-of-step with its ongoing nuclear force modernization. Therefore, the overall role of the RF is surrounded by doctrinal ambiguity and opacity. This is one of the main reasons Chinese experts often argue in favor of intent over capabilities when asked for transparency of the Chinese nuclear weapons program because it is easy for intentions to change whereas capability reflects a state's real capacity and intention based on material capability.[954]

[951] Ian Williams and Masao Dahlgren, "More Than Missiles: China Previews its New Way of War," *CSIS*, October 16, 2019, accessed January 12, 2022, https://www.csis.org/analysis/more-missiles-china-previews-its-new-way-war
[952] Lora Saalman, "China: Lines blur between Nuclear and Conventional Warfighting," *The Interpreter*, December 19, 2014, accessed August 11, 2021, https://www.lowyinstitute.org/the-interpreter/china-lines-blur-between-nuclear-and-conventional-warfighting
[953] Lora Saalman, "China: Lines blur between nuclear and conventional warfighting"
[954] Ibid

5.3.6 China's Nuclear Deterrence and Counterattack Campaigns

According to the 2019 DWP, nuclear deterrence is the primary purpose of China's nuclear forces. According to PLA officers, due to the rapid deployment and ready-to-launch capacities and the necessity to evade adversary's missile defense systems, missiles are unique and necessary for such operations. Like other nuclear powers, the CMC headed by China's president will control China's nuclear deterrent campaigns in the event of conflict because of the broad external and internal factors that must be considered, and to try ensure a favorable strategic outcome for China.

The PLARF is responsible for most nuclear deterrence operations. The official documents define deterrence campaigns as military activities to create impetus and demonstrate strength to compel an adversary to submit to one's will or contain the adversary's aggressive actions.[955] This definition suggests that China might use nuclear blackmail to compel an adversary to submit, and if deterrence fails, it will employ nuclear weapons to prevent the adversary from stepping up the escalation ladder for escalation dominance. The Chinese understanding of the deterrence campaigns is closely knit with its understanding of general deterrence, which has an offensive connotation, which has been discussed in Chapter Two. It appears that the Chinese understanding of deterrence campaigns is influenced by Colin Gray and Keith Payne's classic article, "Victory is Possible" which stated during the Cold War that "an adequate U.S. deterrent posture is one that denies the Soviet Union any plausible hope of success at any level of strategic conflict; offers a likely prospect of Soviet defeat; and offers a reasonable chance of limiting damage to the United States."[956]

The 2013 SMS notes the US and Russia maintain superior nuclear capabilities and maintains that doctrinal ambiguity and opacity of nuclear deterrence helps in creating,

> a moderately blurry military thinking [that] can have a profound effect on the most difficult and complex situation…Such an approach as this will increase the difficulty of the other party's decision-making and help to enhance the deterrent effect of China's limited nuclear deterrent.[957]

For establishing and altering the intensity of nuclear deterrence, China's SMS suggests different means to influence the adversary's decision-making, such as propaganda through media, raising the alertness level of forces, demonstrating strength, force

[955] *The Science of Military Strategy* 2013, 171-173
[956] Colin S. Gray and Keith Payne, "Victory Is Possible," *Foreign Policy* No. 39, (Summer 1980), 26-27
[957] *The Science of Military Strategy* 2013, 173

mobilization to build momentum, organizing launch exercises and warning strikes, and lowering the nuclear threshold to ensure 'moderately blurry' thinking.[958] Such a move could be highly escalatory. Moreover, China's NFU policy could be obviated in this instance if a deliberate move to a lower threshold takes place. This suggests contradictions and ambiguities are maintained deliberately to ensure that adversaries, such as the US, have imprecise military thinking about China's nuclear policy that may deter the US from conducting conventional counterforce attacks. It might also help China to conceal its relatively inferior nuclear capability vis-à-vis the US to maintain credible nuclear deterrence. These contradictions are also necessitated by the tensions between nuclear weapons force modernization and the NFU, as force modernization places pressure to change the existing nuclear policy to bring consonance between them.

Apart from nuclear deterrence campaigns, China's nuclear policy allows its forces to use nuclear weapons in a nuclear counterattack or retaliation against a nuclear strike. The decision to use nuclear weapons must come from President Xi, the chairman of the CMC. The survival of China's nuclear forces is a prerequisite for the implementation of a nuclear counterattack. The official documents estimate that China's land-based and sea-based nuclear forces will be at high risk during a nuclear attack. Therefore, all the nuclear forces that survive should have a unified and coordinated response.[959]

5.3.7 Nuclear Command, Control, and Communications Systems (N3C)

China maintains a nuclear doctrine of nuclear counter-attack and a policy of NFU. To date, China relies predominantly on its land-based nuclear-capable missile forces for carrying out a nuclear deterrence against the first use of nuclear weapons. The section examines China's PLARF's nuclear command, control, and communications (NC3) system, the most mature and advanced leg of China's nuclear triad. Where possible, it also speculates about possible arrangements for China's ballistic missile submarine NC3.

China's NC3 is optimized only for the PLARF because, until 2015, its nuclear force has been a strategic monad based on land-based missiles.[960] China is gradually moving towards developing a robust naval leg of the nuclear triad and is likely to establish a strong

[958] Ibid; Zhao Xijun, *Intimidation Warfare: A Comprehensive Discussion of Missile Deterrence*. eds. (Beijing: National Defense University Press, 2005); [958] Yao Yunzhu, "China's Perspective on Nuclear Deterrence," *Air & Space Power Journal*, Vol. 23, No. 4 (Spring 2010); *The Science of Second Artillery Campaigns*

[959] *The Science of Military Strategy* 2013, 173-174

[960] Missile Defense Project, JL-2, *Missile Threat*, Center for Strategic and International Studies, August 12, 2016, last modified July 31, 2021, accessed January 12, 2022, https://missilethreat.csis.org/missile/jl-2/.

air leg in the future, as discussed earlier. The decision to develop and enhance China's naval leg was taken in 1958 before the PLASAF came into being. However, the tangible developments for acquiring an operational ballistic missile submarine (SSBN) capability started in late 1988 when JL-1 SLBM was test-fired successfully from Xia-class, Type-092 first-generation SSBN. According to Western sources, Xia-class SSBN has never conducted a deterrent patrol.[961] However, the PLAN built and deployed the Type 094 in 2015, and the Type 096 SSBN is under development. Meanwhile, PLAAF bombers are still incapable of delivering nuclear weapons over long distances because of their limited range and vulnerability.[962] However, China has also undertaken an ambitious PLAAF modernization plan. Details on China's nuclear weapons force capability are discussed in the next section.

Historically, China's nuclear weapons use doctrine has impacted NC3 in two broad ways. Firstly, because of centralized command, only the top civilian leadership reserved the right to authorize the use of nuclear weapons. Therefore, China opted for negative control systems over its nuclear weapons. Negative control systems are designed to ensure that "nuclear weapons will not be launched when they should not be."[963] Positive control systems are designed to make sure that "nuclear weapons will be launched when they need to be."[964] The negative control is evaluated by a state's ability to constrain the launching of nuclear weapons during a crisis under pressure, while positive control is evaluated by a state's ability to launch weapons, specifically in retaliation to a first nuclear strike.[965] By employing negative control, China makes sure that nuclear weapons are not launched without orders from the central authority, the president. It also reflects China's practice of some kind of restraint, at least at the declaratory level, possibly because of

[961] Tong Zhao, "China's Sea-Based Nuclear Deterrent," *Carnegie-Tsinghua Center for Global Policy*, June 30, 2016, accessed August 12, 2021, https://carnegietsinghua.org/2016/06/30/china-s-sea-based-nuclear-deterrent-pub-63909; Andrew S. Erickson and Lyle J. Goldstein, "China's Future Nuclear Submarine Force: Insights from Chinese Writings," *Naval War College Review 60*, No. 1, (2007) https://apps.dtic.mil/sti/pdfs/ADA519346.pdf; Hans M. Kristensen, Robert S. Norris, and Matthew G. McKinzie, *Chinese Nuclear Forces and U.S. Nuclear War Planning* (Washington, DC: FAS and Natural Resources Defense Council, 2006); Ronald O'Rourke, *China Naval Modernization: Implications for U.S. Navy Capabilities: Background and Issues for Congress*, (Washington, DC: CRS, 2008).
[962] Zhao, "China's Sea-Based Nuclear Deterrent"
[963] Jordan Seng, "Less is More: Command and Control Advantages of Minor Nuclear States," *Security Studies*, Vol. 6, No. 4, (1997), 50-92
[964] Ibid
[965] Ibid; Peter Douglas Feaver, *Guarding the Guardians: Civilian Control of Nuclear Weapons in the United States* (Ithaca: Cornell University Press, 1992); John D. Steinbruner, "Choices and Trade Offs," in *Managing Nuclear Operations*, Ashton B. Carter, John D. Steinbruner, Charles A. Zraket, eds., (Washington, DC: Brookings Institution, 1987), 539-543

weak or unreliable nuclear command and control. The US maintains positive control, which means once launch orders are received, the missile will be launched.[966]

Secondly, China has a retaliatory nuclear posture. Therefore, to launch a nuclear counter-attack, it is a prerequisite for China to determine first whether nuclear weapons have been used against it. In such circumstances, China's leadership could use NC3 to order a nuclear retaliatory strike. In the past, China has preferred to maintain strict control to ensure the survivability of its nuclear forces.[967] Under this line of thinking, the CMC enforced regulations in 1967 to keep the nuclear missile force's development, deployment, and operations under direct and strict control.[968] Since then, the CMC has had direct control over the nuclear missile force, unlike other services with layers of regional commanding officers.[969] The CMC has established a four-tier hierarchy of command to control nuclear missile forces. The CMC, through the PLARF, to the missile base, to the missile battalion, and then to the launch company, maintains direct command and control.[970]

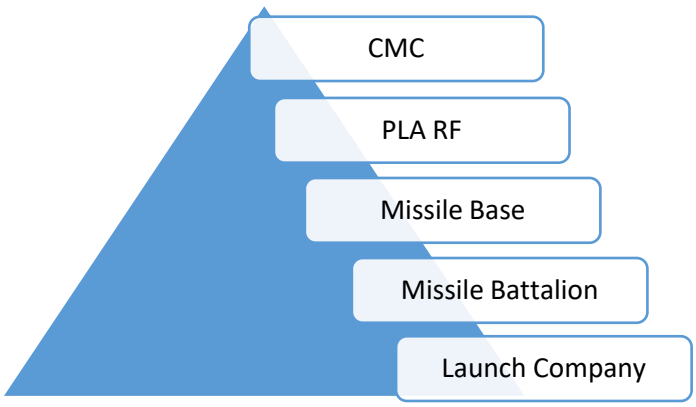

Figure 8: Hierarchy of PLA Rocket Force

[966] Jason Wiese, "The Myth of the Big Red Button: How the ICBM Force maintains Positive Control, Nuclear Surety," *US Air Force Global Strike Command Afstrat-Air*, May 6, 2014, accessed August 12, 2021, https://www.afgsc.af.mil/News/Features/Display/Article/629957/the-myth-of-the-big-red-button-how-the-icbm-force-maintains-positive-control-nu/

[967] Fiona Cunningham, "Nuclear Command, Control, and Communications Systems of the People's Republic of China", *NAPSNet* Special Reports, July 18, 2019, accessed February 12, 2020, https://nautilus.org/napsnet/napsnet-special-reports/nuclear-command-control-and-communications-systems-of-the-peoples-republic-of-china/

[968] Ibid

[969] Ibid

[970] Fiona S. Cunningham, "*Maximizing Leverage: Explaining China's Strategic Force Posture Choices in Limited Wars*" (Ph.D. Dissertation, Political Science Department, Massachusetts Institute of Technology, 2018), 128; also see *The Science of Second Artillery Campaigns*, 161

China has dedicated a fiber-optical communication network and diversified means of communications, including radio frequency and satellites, to maintain robust command and control.[971] The 2004 SMS refers to a communications system relying on radio, cables, fiber-optic, and satellites. According to one study, if communication links with a missile company are severed, the officer of a liaison missile company may deliver the orders in person to the missile company.[972] By the early 2000s, the PLASAF was using automated systems of command and control for missile companies. The automated system established direct command and control of the PLASAF over missile companies on the ground. The system helped in communicating orders, intelligence gathering, and live monitoring of missile launches.[973]

Information on China's SSBN command and communication system is scarcely available in open-source media. Some analysts have maintained that SSBNs deterrent patrols would remain close to Chinese shores, avoiding open-seas patrols. China may expand its SSBNs operations in 2030 when its next-generation SSBNs are ready for deployment, which will be quieter and more advanced technologically than current Type-094 SSBNs.[974] According to Zhao Tong, some Chinese open-source material suggests that,

> In 2009, China reportedly completed construction on its first military super low frequencies (SLF) transmission station and conducted several tests. One year later, a Chinese nuclear submarine successfully received messages from the SLF transmission station, as China became the third country in the world to establish a comparable submarine communications system.[975]

Such systems would enhance long-distance communications and, therefore, the survivability of Chinese submarines. In 2004, China's SSN was detected by Japan and the US anti-submarine warfare (ASW) platforms when returning from the Western Pacific to China.[976] In 2013, China's nuclear attack submarine, for the first time, was deployed for patrols in the Indian Ocean for two months and traveled up to the Gulf of

[971] Michael S. Chase, Daniel Yoon, and Mark A. Stokes, "The People's Liberation Army Second Artillery Force (PLASAF) as an Organization," in *The PLA as Organization v2.0*, eds. Kevin Pollpeter and Kenneth W. Allen (Vienna, V.A.: Defense Group, Inc., 2015), 409
[972] Fiona S. Cunningham and M. Taylor Fravel, "Assuring Assured Retaliation: China's Nuclear Strategy and U.S.-China Strategic Stability," *International Security*, Vol. 40, No. 2, (2019), 45
[973] Fiona Cunningham, "Nuclear Command, Control, and Communications," 5
[974] Annual Report to Congress: Military and Security Developments Involving the People's Republic of China 20021, 49; Tong Zhao, *Tides of Change: China's Nuclear Ballistic Missile Submarines and Strategic Stability* (Washington, D.C.: Carnegie Endowment for International Peace, 2018).
[975] Ibid., 37
[976] Ibid., 36

Aden.[977] Since then, China has been conducting regular SSN patrols for anti-piracy close to the Gulf of Aden.[978]

The successful patrols emphasize that China has achieved the technological capability to communicate reliably with its nuclear submarines at long distances.[979] China has also been exploring the use of satellites to communicate with submarines.[980] Together, these platforms would assist China in maintaining communications and diversifying its NC3 systems. Yet, these systems have vulnerabilities. Any airborne system for submarine communication could be vulnerable to air defense systems, and the ground-based C3 system could be vulnerable to adversary precision strikes. Similarly, during satellite communications, the signals could be jammed or tampered with, the satellite could be vulnerable to the adversary's ASAT capabilities, a cyber-attack could be disruptive, and submarines may become vulnerable to the adversary's anti-submarine warfare as they surface to receive signals for communication. Additionally, unlike the PLARF, the PLAN cannot replicate the NC3 system for handling nuclear payloads by physically approaching the missile company on the ground through the liaison officer. The PLAN needs to keep the nuclear payload on board or arrive to dock SSBNs to receive warheads, making it vulnerable to the adversary's ASW. This may lead the CMC to consider pre-delegation of authority to the submarine commander to employ nuclear weapons.

China is continuously modernizing its missile attack early-warning system, which is based on ground-based radars and space-based satellites.[981] The system is based on a highly sophisticated series of networks of ground-based radar systems and satellite sensors. The primary objective of a missile attack early warning system is to detect an ICBM launch, determine its trajectory and generate timely responses. China operates three phased-array radars, similar to the US' PAVE PAWS radars. The *2019 White Paper* of China, like its 2015 version, clearly states that China is improving its strategic early warning capabilities.[982] Russia is helping China in establishing a space-based early

[977] Ibid., 37
[978] Zhao, *Tides of Change*, 37
[979] Ibid., 36-38
[980] Ibid
[981] Vinayak Bhat, "Where do China's Missile Early Warning Capabilities stand? Eye in the Sky tells you," *India Today*, August 11, 2020, accessed August 17, 2021, https://www.indiatoday.in/world/story/china-missile-early-warning-capabilities-satellite-images-1709882-2020-08-11; Alexander Korolev, "China–Russia Cooperation on Missile Attack Early Warning Systems," *East Asia Forum*, November 20, 2020, accessed August 16, 2021, https://www.eastasiaforum.org/2020/11/20/china-russia-cooperation-on-missile-attack-early-warning-systems/
[982] State Council Information Office, 2019; State Council Information Office, 2015

warning system. President Vladimir Putin in October 2019 stated, "we are now helping our Chinese partners create a missile attack warning system," which "will drastically increase China's defense capability," mentioning that currently only Russia and the US operate comprehensive early-warning missile networks.[983] The details of Russian cooperation with China are so far unclear.[984] According to analysts, the cooperation, which involves secret agreements, covers the aviation industry, air and missile defense systems, ballistic missile early warning systems based on ground-based radars and space-based sensors, hypersonic weapons, submarine quieting technologies, and undersea sensors.[985] The level of strategic collaboration can be understood from the fact that from March 2013 to June 2019, Putin and Xi have met more than 30 times.[986] And recently Putin met Xi, for the first time face-to-face after the spread of Covid, issuing a joint statement announcing "no-limits" to friendship, just before the Russian invasion of Ukraine.[987] Russia might also extend training involving PLA personnel and Russian equipment as Russia did in the past, helping China build nuclear weapons and missile programs.[988]

China has robust space-based systems to maintain strategic situational awareness. By April 2021, China was operating 431 satellites.[989] These satellites are equipped with a wide range of sensors such as "electronic intelligence, ELINT, electro-optical (EO)

[983] Richard Weitz, "China, Russia and Missile Diplomacy," *China &US Focus*, November 28, 2019, accessed August 11, 2021, https://www.chinausfocus.com/foreign-policy/china-russia-and-missile-diplomacy

[984] Brett Forrest, Ann M. Simmons and Chao Deng, "China and Russia Military Cooperation Raises Prospect of New Challenge to American Power," *The Wall Street*, January 2, 2022, accessed January 14, 2022, https://www.wsj.com/articles/china-russia-america-military-exercises-weapons-war-xi-putin-biden-11641146041#:~:text=China%20and%20Russia%20don't,on%20relations%20with%20the%20U.S.

[985] Michael Kofman, "The Emperors League: Understanding Sino-Russian Defense Cooperation," *War on the Rocks*, August 6, 2020, accessed January 15, 2022, https://warontherocks.com/2020/08/the-emperors-league-understanding-sino-russian-defense-cooperation/; Christopher Weidacher Hsiung, "Missile Defense and Early Warning Missile Attack System Cooperation: Enhancing the Sino-Russian Defense Partnership," *IFS Insights 7/2020*, accessed August 12, 2021, https://fhs.brage.unit.no/fhs-xmlui/bitstream/handle/11250/2675322/IFS%20Insight%207_2020.pdf?sequence=1&isAllowed=y

[986] Holly Ellyatt, "China's Xi calls Putin His 'Best Friend' against a Backdrop of Souring US Relations," *CNBC*, June 5, 2019, accessed January 15, 2022, https://www.cnbc.com/2019/06/05/putin-and-xi-meet-to-strengthen-ties-as-us-relations-sour.html

[987] Rajagopalan, "Putin and Xi Frame a New China-Russia Partnership,"

[988] Hsiung, "Missile Defense and Early Warning Missile Attack System Cooperation"

[989] Union of Concerned Scientists, "UCS Satellite Database," https://www.ucsusa.org/resources/satellite-database#.XE6li89Kg_U

sensors, synthetic aperture radar (SAR), staring camera, stereoscopic imagers, and hyperspectral, among others."[990]

The operational readiness of China's missile attack early warning system is yet unclear. Once fully operational, the system will significantly improve early warning and ISR capabilities. It will help China to adopt launch-on-warning capabilities, as China might rethink its NFU.[991]

Although launch-on-warning may suit China's limited strategic capability (the limited number of warheads and the current state of its early-warning systems) it would appear to be technically challenging as China would need a fully operational missile attack early warning system. It may also require policy changes such as increasing the alert level of its nuclear forces.

5.3.8 Critical Examination and Discussion

The introduction of conventional missiles into the PLARF is a comparatively recent phenomenon and has gained international attention because of the growth of China's conventional missile force. Some experts are concerned that any US efforts to neutralize conventional forces and associated infrastructure such as China's early warning radar, sensors, launchers, and infrastructure might inadvertently destroy or damage China's nuclear missile force or dual-capable missiles, such as the DF-21 and DF-26, which may provoke China to retaliate with nuclear weapons. [992]

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[990] Kevin Pollpeter, "Testimony before the U.S.-China Economic and Security Review Commission: Hearing on China's Advanced Weapons," February 23, 2017, accessed August 12, 2021, https://www.uscc.gov/sites/default/files/Pollpeter_Testimony_0.pdf

[991] Anthony H. Cordesman, "Chinese Space Strategy and Developments," *Center for Strategic and International Studies*, August 19, 2016, August 11, 2021, https://www.csis.org/analysis/china-space-strategy-and-developments; Minnie Chan and Kristin Huang, "Is China about to Abandon Its 'No First Use' Nuclear Weapons Policy?" February 7, 2019, March 31, 2020, https://www.scmp.com/news/china/military/article/2184577/could-china-abandon-its-no-first-use-nuclear-weapons-policy; also see Gregory Kulacki, "China's Military calls for putting its Nuclear Forces on Alert," *Union of Concerned Scientists*, January 2016, accessed February 16, 2020, https://www.ucsusa.org/sites/default/files/attach/2016/02/China-Hair-Trigger-full-report.pdf

[992] Thomas Christensen, "The Meaning of the Nuclear Evolution: China's Strategic Modernization and US-China Security Relations," *Journal of Strategic Studies*, Vol. 35, No. 4,(2012), 468; Avery Goldstein, "First Things First: The Pressing Danger of Crisis Instability in U.S.-China Relations," *International Security*, Vol. 37, No. 4, (Spring 2013), 71; Joshua Rovner, "Two Kinds of Catastrophe: Nuclear Escalation and Protracted War in Asia," *Journal of Strategic Studies*, Vol 40, No. 5, (2017) 696-730; Caitlin Talmadge, "Would China Go Nuclear? Assessing the Risk of Chinese Nuclear Escalation in a Conventional War with the United States," *International Security*, Vol. 41, No. 4, (2017), 50-92; Tong Zhao and Li Bin, "The Underappreciated Risks of Entanglement: A Chinese Perspective," in *Entanglement: Russian and Chinese Perspectives on Non-Nuclear Weapons and Nuclear Risks*, ed. James M. Acton (Washington, D.C.: Carnegie Endowment for International Peace, 2017)

China maintains negative control over its nuclear weapons to ensure that the CMC has strict control over the alerting and authorization of the use of nuclear weapons.[993] How China operationalizes negative control using technical and personnel systems is not clear. In the 1990s, Chinese scientists requested the US to provide it with permissive action links (PALs) to help it ensure control over its nuclear weapons, but the US rejected the request. The PALs are the coded devices installed in nuclear weapons to prevent unauthorized or accidental use of nuclear weapons. It is unclear why the US refused to provide technical support on PALs. It might be because then-US authorities were less worried about the safety and security of China's limited nuclear weapons inventory, viewing that any contingency would have regional repercussions, which might involve Russia – the arch-rival of the US. However, China devised its own use-control systems.[994] Though the PLARF now has technical-use-controls, it still maintains the physical separation of nuclear warheads from delivery systems and keeps them in a central storage facility during peacetime. The separation is mainly to avoid unauthorized or accidental use of nuclear weapons. The nuclear warheads can be dispatched when authorized by the CMC alertness level of nuclear forces.[995] In the case of SSBNs, the PLA maintains complete secrecy. The role of the PLAN in the handling of nuclear weapons is vague, and whether China's SSBNs carry SLBMs during peacetime is unknown.[996] China's SSBNs might be carrying out deterrence patrol in the bastion sea with SLBMs on board. It may also expand deterrent patrol operations once the next-generation Type-096 SSBNs get operational.

China appears committed to making the NC3 system more robust in the future. The new platforms and capabilities, such as space-based strategic early warning systems and the SSBNs, may strengthen deterrence. China's longstanding fear of a US' disarming first strike against its nuclear forces, and emerging concerns about US missile defenses and cyberattacks on its NC3 systems, will drive China to greater levels of investments in both redundant communication systems and early strategic warning systems to ensure the survivability of its nuclear forces. However, emerging vulnerabilities of platforms such

[993] Ibid; Steve Coll, "The Man Inside China's Bomb Labs," *The Washington Post*, May 16, 2001, https://www.washingtonpost.com/archive/politics/2001/05/16/the-man-inside-chinas-bomb-labs/b517231d-b91a-4c83-94a0-23f8c4516841/
[994] Coll, "The Man Inside China's Bomb Labs"
[995] Mark A. Stokes, "*China's Nuclear Warhead Storage and Handling System*" (Washington, D.C.: Project 2049 Institute, March 12, 2010)
[996] David C. Logan, "China's Future SSBN Command and Control Structure," *INSS Strategic Forum* (National Defense University, 2016), 3

as NC3 would provide leaders with fewer options, such as to arm SSBNs with nuclear-capable SLBMs in peacetime with clear operational instructions for SSBN commanders on board if communications collapse with the CMC. With space-based strategic early warning capabilities in place, China may adopt a launch-on-warning posture; however, it may require changes in nuclear policy, as discussed above. After the 2015 military reforms, China is on a fast-track military modernization program, involving foreign procurements and indigenous efforts. It might not take China long to achieve a sound military and technological base to alter its existing nuclear weapons doctrine. The operationalization of the next-generation SSBNs with MIRV-ed JL-3, ongoing silo fields developments, and successful development of missile attack early physical warning systems would be needed for China to alter its nuclear weapons doctrine.

The next part of this chapter focuses on developments occurring in China's nuclear force modernization. This part will help us understand whether the new capabilities that will be inaugurated via China's nuclear and military modernization will either 'fit' and enhance the current nuclear policy or potentially lead China to change it, since the new capabilities may allow a new policy. Or it may be China's intention to alter the NFU, so it is, therefore, seeking new capabilities to pursue changes in the nuclear policy.

5.4 China Nuclear Force Modernization

Since going nuclear, China has relied on foreign and indigenous inputs to gradually modernize and miniaturize its nuclear warheads, which in turn helped it develop tactical nuclear weapons in the 1980s.[997] Initially, as discussed in earlier chapters, Russia helped China build a nuclear weapons program by providing nuclear weapons technology, designs, training, and other required material. Russia is now helping China build the PLA Air Force, an air and missile defense system, early warning systems, and radars, significantly boosting China's nuclear deterrence capability.[998]

China has been modernizing its nuclear forces since the 1980s. It has increased the number of nuclear warheads and delivery vehicles. China, in only one year, from June 2018 to June 2019, fielded a new version of a mid-range nuclear-capable ballistic missile,

[997] Robert S. Norris and Hans M. Kristensen, "Chinese Nuclear Forces, 2011," *Bulletin of the Atomic Scientists*, Vol. 67, No. 6, (2011), 81-85

[998] Weitz, "China, Russia and Missile Diplomacy"; Forrest, Simmons and Deng, "China and Russia Military Cooperation"; Kofman, The Emperors League: Understanding Sino-Russian Defense Cooperation; Hsiung, Missile defense and early warning missile attack system cooperation

a new dual-capable intermediate-range mobile ballistic missile, and upgraded the transporter erector launcher (TEL) mobile launcher of the DF-31AG ICBM. In December 2019, China carried out a test of a new nuclear-capable, the JL-3 SLBM.[999] Addtitionally, China continues to develop multiple MIRV-capable ICBMs, including an air-launched dual-capable ballistic missile.[1000]

Table 10. Chinese Nuclear Forces 2020[1001]

Type	NATO Designation	No of Launchers	Year Deployed	Range (KM)	Warhead X Yield (KT)	No of Warheads
Land-Based Ballistic Missiles						
DF-4	CSS-3	5	1980	5,500+	1 x 3,300	6
DF-5A	CSS-4 Mod 2	10	1981	12,000	1 x 4,000-5,000	10
DF-5B	CSS-4 Mod 3	10	2015	13,000	5 (MIRV) x 200-300	50
DF-5C	CSS-4 Mod 4	n.a.	(2020)	13,000	MIRV	--
DF-15	CSS-6	?	1990	600	1 x ?	--
DF-17	?	(18)	(2021)	1,800+	1xHGV	--
DF-21 A/E	CSS-5 Mod 2, 6	40	2000, 2016	2,100+	1 x 200-300	40
DF-26	?	100	2016	4,000	1 x 200-300	20
DF-31	CSS-10 Mod 1	6	2006	7,200	1 x 200-300	6
DF-31A	CSS-10 Mod 2	36	2007	11,200	1 x 200-300	36
DF-31AG	(CSS-10 Mod 3?)	36	2018	11,200	1 x 200-300	36
DF-41	CSS-X-20	18	(2021)	12,000	3 x 200-300 to 10 x 200-300 (low to high MIRVscenario)	18x3=54 (conservative figure) 18x10=180 180 figure not included in the total count

[999] Kristensen and Korda, *Chinese Nuclear Forces*, 2019
[1000] Bill Gertz, China's test of sub-launched missile a threat to peace, retired captain warns, *The Washington Times*, December 24, 2019, accessed February 14, 2020, https://www.washingtontimes.com/news/2019/dec/24/china-tests-submarine-launched-jl-3-missile-capabl/
[1001] Kristensen and Korda, *Chinese Nuclear Forces*, 2020

Subtotal		280				254
Silos Missile Fields (3 fields with estimated 300+ silos)						
DF-41 (newly discovered silo fields)	CSS-X-20	300	(2021)	12,000	3 x 200-300 10 x 200-300 (worst-case MIRV scenario)	3x300=900 (conservative figure) 300x10=3000 figure not included in the total count
Subtotal (including newly discovered silo fields)		580				1158
Submarine-Launched Ballistic Missiles						
JL-2	CSS-N-14	6(72)	(2016)	7,000+	1 x 200-300	72
JL-3			(2025)	7,000+		
Aircraft						
H-6K	B-6	20	1965/2009	3,100+	1 x bomb	20
H-6N	B-6		2024		(1 x ALBM)	n.a.
H-20			2025		(bombxALCM)	
Fighters	?	?	?	n.a.	1 x bomb	?
Total		**372(672)**				**350(1250)**

Currently, China has an estimated nuclear stockpile of 350 warheads and six types of nuclear warhead assemblies: "a 15-40kt fission bomb; a 20kt missile warhead; a three megaton (mt) thermonuclear missile warhead; a 3 mt thermonuclear gravity bomb; a 4-5 mt missile warhead; and a 200-300kt missile warhead." The 350 warheads are projected to increase manifoldly over the next decade, and the numbers and varieties of China's nuclear delivery means are also growing. [1002]

China is also adding a MIRV capability to its ICBMs, and MIRV-ed missiles will require more nuclear warheads. Even if only considered for a nuclear counter-attack (and to satisfy NFU requirements) rather than increasing the payload capacity of missiles, according to conservative estimates, a MIRV-ed missile would carry a minimum of three

[1002] Kristensen and Korda, *Chinese Nuclear Forces*, 2019; Robert P. Ashley, "Russian and Chinese Nuclear Modernization Trends, Remarks at the Hudson Institute," May 29. 2019, accessed February 16, 2020, https://www.dia.mil/News/Speeches-and-Testimonies/Article-View/Article/1859890/russian-and-chinese-nuclear-modernization-trends/

and a maximum of ten warheads per missile.[1003] Moreover, as noted in Chapter Three, the increasing number of US BMD interceptors and improving precision strike capabilities of the US puts pressure on China to introduce further changes in its nuclear weapons policy to ensure the deterrence credibility of its nuclear counterattack capability. Such policy changes may potentially require a further increase in the nuclear inventory of China. For instance, the ongoing development of missile silo fields carrying hundreds of missiles looks all but certain to add many more nuclear weapons to China's arsenal.[1004]

5.4.1 Land-Based Nuclear Forces

China is modernizing its land-based nuclear-capable missile forces. According to the *Bulletin of Atomic Scientists* (*BAS*), China has approximately 180 to 190 land-based missiles capable of delivering nuclear weapons.[1005] This figure does not include missiles required for the new silo fields, which would require more than 30 missiles.[1006] There have been qualitative and quantitative improvements in the missile force. In less than a decade, China has fielded as many as four land-based nuclear-capable missiles, including a modified DF-21 – Medium-Range Ballistic Missile (MRBM), a new DF-26 – IRBM, an ICBM launcher DF-31AG (a modified version of DF-31A), and most recently, a new DF-41 – ICBM capable of delivering up to 10 MIRV-ed warheads.[1007] It also has a DF-5 series of silos-based ICBMs with a range of 13,00km.[1008] The DF-5B version is also capable of MIRV-ing with three warheads. However, the DF-5C version can be equipped with as many as 10 MIRV-ed warheads. China's DF-5 silos-based ICBMs the only missiles with liquid fuel propellants, are expected to be replaced by the DF-41. The aim is to increase the range and mobility, convert missiles from liquid to solid fuel, and enable the quick launching of missiles.[1009]

China has maintained a relatively stable ICBM inventory for many decades, but since the early 2010s, it has been expanding and modernizing its land-based ICBM inventory. Therefore, the numbers are increasing, and newly-deployed missiles are qualitatively

[1003] Kristensen and Korda, "Chinese Nuclear Forces, 2019"
[1004] Kristensen and Korda, "China is building A Second Nuclear Missile Silo Field"
[1005] Kristensen and Korda, "Chinese Nuclear Forces, 2019"
[1006] Kristensen and Korda, "China is building A Second Nuclear Missile Silo Field"
[1007] Kristensen and Korda, "Chinese Nuclear Forces, 2019"; Missile Defense Project, "DF-41 (Dong Feng-41 / CSS-X-20)," *Missile Threat*, Center for Strategic and International Studies, August 12, 2016, last modified October 8, 2019, Accessed February 16, 2020, https://missilethreat.csis.org/missile/df-41/
[1008] Missile Defense Project, "DF-5 (Dong Feng-5 / CSS-4)," *Missile Threat*, Center for Strategic and International Studies, August 12, 2016, last modified November 18, 2019, Accessed February 16, 2020, https://missilethreat.csis.org/missile/df-5-ab/
[1009] Kristensen and Korda, "Chinese Nuclear Forces, 2021"

superior. According to the US DoD, China possesses 90 ICBMs and launchers, whereas the *BAS* claims this number could be at the high end, given their estimated range of 65-90, excluding silo field count.[1010] China's major focus, for almost a decade, has been on the modernization of its ICBM inventory. However, the recent disclosure of silo fields suggests that the quantitative increase is an important part of China's nuclear force modernization apart from qualitative improvement. In March 2021, President Xi, at the plenary meeting of the delegation of the People's Liberation Army and the Armed Police Force, emphasized,

> It is necessary to adhere to the leadership of construction by war, strengthen the overall planning of war construction, accelerate the promotion of major strategic, leading and fundamental projects, and accelerate the creation of a high-level strategic deterrence and joint operations system.[1011]

Such strong, direct, and publicly made directions from China's paramount leader may steer China's nuclear weapons policy and force modernization away from what it is today towards something more assertive. China has various operational ICBMs, such as the DF-4 with a range of 4,500-5,500km; the DF-5 with 13,000km; the DF-31 with 8,000-11,700km; and the DF-41 with 12,000-15,000km.

The DF-4 is a nuclear-capable liquid-fuelled intermediate to intercontinental ballistic missile (IRBM/ICBM) with an estimated range between 4,500-5,500km.[1012] It has only one operational brigade[1013] with approximately 10-15 operational launchers.[1014] The DF-5 is also a nuclear-capable and liquid-fueled, but silo-based ICBM with a range of 13,000km, making it capable of hitting targets throughout the US. The DF-5 has A/B/C

[1010] Office of the Secretary of Defense, *Annual Report to Congress: Military and Security Developments Involving the People's Republic of China 2019*, May 3, 2019, accessed February 17, 2020, https://media.defense.gov/2019/May/02/ 2002127082/-1/-1/1/2019_CHINA_MILITARY_POWER_REPORT.pdf; Kristensen and Korda, "Chinese Nuclear Forces, 2019"

[1011] Xinhuanet (The two sessions are authorized to issue) Xi Jinping, when attending the plenary meeting of the delegations of the People's Liberation Army and the Armed Police Force, emphasized the realization of the "14th Five-Year Plan" period for national defense and army building to start well and greet the 100th anniversary of the founding of the Communist Party of China with outstanding performance, *Xinhuanet*, March 9, 2021, accessed August 12, 2021, http://www.xinhuanet.com/politics/2021-03/09/c_1127191057.htm

[1012] Missile Defense Project, "DF-4 (Dong Feng-4 / CSS-3)," *Missile Threat*, Center for Strategic and International Studies, October 26, 2017, last modified November 26, 2019, https://missilethreat.csis.org/missile/df-4/

[1013] Hans M. Kristenson, "New FAS Nuclear Notebook: Chinese Nuclear Forces, 2016," *Federation of American Scientists*, July 1, 2016, https://fas.org/blogs/security/2016/07/china-notebook-2016/

[1014] "Ballistic and Cruise Missile Threat," *National Air and Space Intelligence Center*, June 2017, http://www.nasic.af.mil/LinkClick.aspx?fileticket=F2VLcKSmCTE%3d&portalid=19

variants. China's DF-5B and DF-5C have MIRV-ing capability and are expected to be replaced by the DF-41. China is reported to have around 10 DF-5B launchers and 30 MIRVs warheads.[1015] The MIRV-capable DF-5C can also be equipped with 10 warheads, but the total number of the DF-5C is unknown.[1016]

The DF-31 has an intercontinental range. It is both a road and rail-mobile missile with solid fuel propellant. The nuclear-capable DF-31 has an estimated range of 7,200km, and is presumed to have a regional role against potential regional threats emanating from India and Guam. In total, China has eight launchers for the DF-31. The DF-31 has two variants, nuclear-capable solid-fuelled DF-31A and DF-31AG, and both have a similar range of approximately 11,200km.[1017] The only difference between variants is that the DF-31AG has improved transporter-erector-launcher (TEL), increasing mobility and survivability.[1018] Both missiles can engage targets in most of the continental US. China has approximately 48 DF-31 A&AG in its missile inventory.

The DF-41 is China's most recent and advanced ICBM. It is a both road and rail mobile ICBM with an estimated range of 12,000 to 15,000km, making it China's longest-range missile. It can deliver as many as 10 MIRV-ed warheads to the continental US within 30 minutes.[1019] The missile completed its seventh test in 2016, and it is in the early stage of fielding.[1020] Initially, China was likely to produce between 18 of these missiles, but recent discoveries and analysis show that China is more likely to field DF-41 in the new silos. This would significantly increase the number of missiles from 18 to more than 318.[1021]

[1015] Scott LaFoy, "Building a Credible Arsenal: China's Improved ICBMs," *China Brief*, Vol. 15, Issue 21, November 2, 2015, accessed February 17, 2020, http://www.jamestown.org/programs/chinabrief/single/?tx_ttnews%5Btt_news%5D=44559&cHash=2eb7d26fff82cc6024550ed28fd502ba#.V6s40k0rLcs; M. Kristensen and Robert S. Norris, "Chinese Nuclear Forces, 2016"; Bill Gertz, China Tests Missile with 10 Warheads, *The Washington Free Beacon*, January 31, 2017, accessed February 17, 2020, http://freebeacon.com/national-security/china-tests-missile-10-warheads/

[1016] Ibid

[1017] Missile Defense Project, "DF-31 (Dong Feng-31 / CSS-10)," *Missile Threat*, Center for Strategic and International Studies, August 12, 2016, last modified October 8, 2019, https://missilethreat.csis.org/missile/df-31/

[1018] Kristensen and Korda, "Chinese Nuclear Forces, 2019"; Office of the Secretary of Defense, *Annual Report to Congress: Military and Security Developments involving the People's Republic of China 2018,* May 16, 2018, accessed February 17, 2020, https://media.defense.gov/2018/Aug/16/ 2001955282/-1/-1/1/2018-CHINA-MILITARY-POWERREPORT.PDF

[1019] Missile Defense Project, "DF-41 (Dong Feng-41 / CSS-X-20)," *Missile Threat*, Center for Strategic and International Studies, August 12, 2016, last modified October 8, 2019, https://missilethreat.csis.org/missile/df-41/

[1020] Kristensen and Korda, "Chinese Nuclear Forces, 2020," 443

[1021] Kristensen and Korda, "Chinese Nuclear Forces, 2021"

For regional operations, China fields a DF-21 series of MRBMs. The DF-21 series has A/B/C/D variants.[1022] The DF-21A and the DF-21E are the nuclear versions of the DF-21. According to some estimates, China fields approximately 40 launchers for nuclear-capable DF-21.[1023] China also deploys two conventional versions of DF-21. The DF-21C version is employed for land attacks, and the DF-21D is an anti-ship missile, also known as 'carrier killer' due to its capacity to potentially cripple US aircraft carriers.[1024] China also deploys the DF-26**,** dual-capable IRBM, but it is considered primarily as a conventionally-armed ballistic missile.[1025] It has a range of 3,000-4,000km, and can strike US military bases in Gaum and Japan.[1026]

5.4.2 **Sea-based Nuclear Forces**

Currently, China possesses six Jin-class (Type 094) nuclear-powered ballistic missile submarines (SSBNs), out of these five are operational.[1027] It is not clear whether the two newest Jin-class SSBNs, handed over to PLAN in April 2020, are operational. Each SSBN can carry 12 JL-2 SLBM, a modified DF-31, capable of carrying a nuclear warhead and, possibly, penetration aids.[1028]

The estimated range of JL-2 SLBM is between 7,200 to 9,000km and it can carry a nuclear payload.[1029] According to some sources, the JL-2 SLBM may also carry a minimum of three and a maximum of eight lower yield MIRV-ed warheads.[1030] After a series of tests, JL-2 entered into service in 2015. Currently, China maintains an inventory of 72 JL-2 warheads.[1031] Although China's Jin-class SSBN is the most advanced, it is also very loud, which makes it vulnerable to adversary strikes. It appears that after the commissioning of

[1022] Missile Defense Project, "DF-21 (Dong Feng-21 / CSS-5)," *Missile Threat*, Center for Strategic and International Studies, April 13, 2016, last modified January 2, 2020, https://missilethreat.csis.org/missile/df-21/
[1023] Kristensen and Korda, "Chinese Nuclear Forces, 2019"
[1024] Missile Defense Project, "DF-21 (Dong Feng-21 / CSS-5)," *Missile Threat*
[1025] Jordan Wilson, "China's Expanding Ability to Conduct Conventional Missile Strikes on Guam," U.S.-China Economic and Security Review Commission, May 10, 2016, 8, https://www.uscc.gov/Research/china%E2%80%99s-expanding-ability-conduct-conventional-missile-strikes-guam
[1026] *IHS Jane's 360*, "Eurosatory 2016: Regional Focus, Asia Pacific," June 16, 2016, http://www.janes.com/article/61438/regional-focus-asia-pacific -es2016d4
[1027] Kristensen and Korda, "Chinese Nuclear Forces, 2021"
[1028] Ibid., 234; Kristensen and Korda, "Chinese Nuclear Forces, 2019"
[1029] Matthew P. Funaiole, Joseph S. Bermudez Jr. and Brian Hart, "A Glimpse of Chinese Ballistic Missile Submarines," *Center for Strategic and International Studies*, August 4, 2021, accessed August 16, 2021, https://www.csis.org/analysis/glimpse-chinese-ballistic-missile-submarines
[1030] JL-2 (CSS-NX-14)," *Global Security*, Last Modified October 01, 2019, accessed February 18, 2020, https://www.globalsecurity.org/wmd/world/china/jl-2.htm
[1031] Kristensen and Korda, "Chinese Nuclear Forces, 2021"

the last two Jin-class SSBNs, China will focus on the development of the third-generation (Type 096) SSBN that is expected to be more advanced and quieter. In total, China operates a fleet of six SSBNs.[1032] According to US Navy officials, China SSBNs have been carrying out deterrent patrols since 2015.[1033] However, the area under patrol was not identified. According to one analyst, the area was far from Chinese waters.[1034] It is also unclear whether China's submarines had nuclear warheads on board.[1035] With JL-2, China can target India, Hawaii, Guam and Alaska.[1036]

During peacetime, the PLAN's access to nuclear warheads would require a significant change in China's nuclear weapons policy. A likely policy change would first require the CMC and the PLAN to train SSBN forces under real-time operational situations. This would necessitate developing advanced C2 technologies and standard operating procedures (SOP). One of the SOPs would require China's SSBNs to identify the SLBM launching position. In order for the SSBNs to strike the US, the SSBNs would have to be positioned in the Pacific, transiting the East China Sea (ECS). Therefore, due to the existing doctrinal limitations and technical constraints, such as vulnerability to enemy ASW platforms, it appears that the SSBNs of the Jin-class category are to be deployed in China's 'bastion' in the South China Sea (SCS), where they can be guarded by attack submarines. However, based on the limited range of JL-2, one can speculate that China may take the risk of deploying the Jin-class SSBNs across the ECS to target the continental US.

According to some sources, China's next-generation SSBNs (Type 096) will carry the JL-3, a modified version of the JL-2 SLBM, with an estimated range of 9,000+km. The JL-3 SLBM would allow China to engage targets in the North-West of the continental US from the ECS.[1037] The most recent test of the JL-3 was successfully carried out in December 2019 from the Jin-class SSBN.[1038] The JL-3, when deployed with an advanced

[1032] Funaiole, Bermudez Jr. and Hart, "A Glimpse of Chinese Ballistic Missile Submarines"
[1033] Kristensen and Korda, "Chinese Nuclear Forces, 2021"
[1034] Mike Yeo, "China Completing More Ballistic Missile Subs, with Plans for a new Version, *Defense News*, May 6, 2019, accessed August 16, 2021, *https://www.defensenews.com/global/asia-pacific/2019/05/06/china-completing-more-ballistic-missile-subs-with-plans-for-a-new-version/;* Richard D. Fisher, Jr., "China Advances Sea- and Land-Based Nuclear Deterrent Capabilities," *IHS Jane's 360*, December 15, 2015; Kristensen and Korda, "Chinese nuclear forces, 2020," *Bulletin of the Atomic Scientists 2020*, Vol. 76, No. 6, (2020), 452
[1035] Kristensen and Korda, "Chinese Nuclear Forces, 2019"
[1036] Funaiole, Bermudez Jr. and Hart, "A Glimpse of Chinese Ballistic Missile Submarines"
[1037] Ibid
[1038] Bill Gertz, "China's Test of Sub-Launched Missile a Threat to Peace, Retired Captain Warns," *The Washington Times*, December 24, 2019, accessed February 19, 2020,

Type 096 SSBN, will augment China's capability to implement an assured nuclear counter-attack with greater assurance.

China's primary strategic goal is to ensure that its nuclear forces can survive a first nuclear strike. To achieve this goal, China is spending considerable resources to improve the survivability of its land-based missile forces, modernizing its existing fleets and developing new missiles. With these new developments in nuclear forces, China's primary strategic goal appears to be changing. The continuous growth in the size and modernization of SSBNs and SLBMs indicates that building a robust and survivable SSBN force is a top priority.[1039] From the mid- to late-2020s, China will be operating a fleet of SSBNs comprising both Type-094 and Type-096 SSBNs, which will give China the capability to maintain its presence in the Chinese waters (the East and the South China Sea) and abroad in the Pacific.[1040] Some analysts assert that the new silo fields are being built to reduce perceived vulnerabilities of the PLARF.[1041] In that case, China may seek to build a more robust SSBNs force as it is effective for preserving a second-strike capability with SSBNs because of their quick mobility and concealment. Moreover, a secure second-strike capability would require China to adopt a continuous at-sea deterrence (CASD) posture, which is more likely once Type-096 SSBNs are operational. These changes in SSBNs force would have far-reaching implications for strategic stability. For instance, CASD would require SSBNs with nuclear weapons at sea and de-centralized nuclear authority. Such a change in nuclear authority would be perceived as an effort to alter the balance of power in China's favor and move away from NFU to first use by states in security competition with China.

5.4.3 **Strategic Bombers**

According to the BAS 2021 report, the PLAAF possesses a small nuclear inventory based on approximately 20 gravity bombs.[1042] Until recently, the PLAAF had no nuclear mission; however, in 2012, it was assigned a strategic deterrence mission. The mission involves the deployment of long-range conventionally armed cruise missiles.[1043] While

https://www.washingtontimes.com/news/2019/dec/24/china-tests-submarine-launched-jl-3-missile-capabl/

[1039] Adam Ni, "The Future of China's Nuclear-Powered Ballistic Missile Submarine Force," *Australian Strategic Policy Institute*, May 8, 2020, accessed August 17, 2021, https://www.aspistrategist.org.au/the-future-of-chinas-nuclear-powered-ballistic-missile-submarine-force/

[1040] Ibid

[1041] Korda and Kristensen, "China is building A Second Nuclear Missile Silo Field,"

[1042] Kristensen and Korda, "Chinese Nuclear Forces, 2021,"

[1043] Ibid

revisiting its 2017 reports on China, the US DoD notes in the 2018 report that the PLAAF has been reassigned a nuclear mission.[1044] In 2019 China revealed the H-6N, signaling the return of an air leg of its nuclear triad. H-6N is capable of air-to-air refueling.[1045]

Additionally, the US DIA reported that China is involved in developing two air-launched ballistic missiles (ALBM) for its H-6N bomber, and one of the missiles might be capable of carrying a nuclear warhead.[1046] Some analysts believe that the ALBM is a modified version of DF-21, tested twice in 2016 and 2018.[1047] The 2021 DoD annual report on China notes, "as of 2020, the PLAAF has operationally fielded the H-6N bomber, providing a platform for the air component of the PRC's nascent nuclear triad."[1048] China is also developing a new strategic bomber, the H-20, which is somewhat similar to the US B-2 bomber. According to the 2020 DoD report on China and the 2021 *BAS* report on the nuclear forces of China, China will begin H-20 bomber production in a decade.[1049]Once operational, the stealth bomber would be able to strike the target in the 'Second-island' chain and beyond. The Second-island chain is an imprecise line comprised of US partners and allies, stretching "from southern Japan through the Ryukyus [Island] and Taiwan, terminating in the Philippines."[1050]

5.5 China's Missile Defense Systems

China's missile defense capability dates back to 1993, when it procured the S-300 surface-to-air missile (SAM) system from Russia.[1051] Later, in 2010, 2013, and 2014,

[1044] *Military and Security Developments Involving the People's Republic of China 2017*, 61; *Military and Security Developments Involving the People's Republic of China 2018*, 75
[1045] *Military and Security Developments Involving the People's Republic of China 2021*, 56
[1046] *Military and Security Developments Involving the People's Republic of China 2021*, 56; Kristensen and Korda, "Chinese Nuclear Forces, 2021"; Vincent R. Stewart, Statement for the Record: Worldwide Threat Assessment, Armed Services Committee United States Senate, February 9, 2016, accessed February 19, 2020, https://www.armed-services.senate.gov/imo/media/doc/Stewart_02-09-16.pdf
[1047] Ankit Panda, "Pentagon: Air-Launched Ballistic Missile will Realize China's Nuclear Triad," *The Diplomat*, May 7, 2019, accessed February 19, 2020, https://thediplomat.com/2019/05/pentagon-air-launched-ballistic-missile-will-realize-chinas-nuclear-triad/
[1048] *Annual Report to Congress: Military and Security Developments Involving the People's Republic of China 2019*, 67
[1049] *Military and Security Developments Involving the People's Republic of China 2021*, 85; Kristensen and Korda, "Chinese Nuclear Forces, 2021"; also see Bradley Perrett, "China's New Bomber should be Cause for Concern for Australia," *Australian Strategic Policy Institute*, February 4, 2020, accessed August 17, 2021, https://www.aspistrategist.org.au/chinas-new-bomber-should-be-cause-for-concern-for-australia/
[1050] Andrew Rhodes, "The Second Island Cloud: A Deeper and Broader Concept for American Presence in the Pacific Islands," *Washington Headquarters Services*, November 18, 2019, accessed August 17, 2021, https://www.whs.mil/News/News-Display/Article/2018920/the-second-island-cloud-a-deeper-and-broader-concept-for-american-presence-in-t/
[1051] Dennis van Vranken Hickey and Christopher Craig Harmel, "United States and China's Military Ties with the Russian Republics," *Asian Affairs: An American Review*, Vol. 20, No. 4 (Winter, 1994), 242

China successfully carried out BMD tests based upon indigenously built systems.[1052] The test carried out in 2014, according to the US, was an anti-satellite (ASAT) missile test.[1053] In an article responding to the 2014 test, Jeffrey Lewis wrote that "it is at least the fourth test of something called the 'SC-19' - China's direct-ascent interceptor, first tested against a satellite in 2007."[1054]

According to *the Eurasian Times*, China's anti-ballistic missile interceptor HQ-19 is operational.[1055] It is designed to intercept medium-range ballistic missiles with a range of 3,000km and can destroy satellites.[1056] China's HQ-19 is an upgraded version of HQ-9, a long-range SAM, which was initially a derivative of the Russian S-300.[1057] China also conducted successful tests of Dong Neng-3 (DN-3) in 2015, 2017, and 2018. The 2018 test of a mid-course land-based missile, the DN-3, successfully intercepted a DF-21 MRBM. Recently, China has procured the Russian S-400 system, the updated version of the S-300, whose details were discussed in Chapter Three.[1058] China has several other air and missile defense systems that are under development, such as the HQ-26 and HD-29. China is also developing sea-based BMD systems. The sea-based systems will help China defend its overseas interests, enhancing the range of missile defense systems.[1059] According to a Chinese analyst, China's HQ-26 system, with a range of 3,500km and expected to be installed on the Type 055 destroyer, is designed for a sea-based BMD role.[1060]

[1052] Charles D. Ferguson and Bruce W. MacDonald, "Nuclear dynamics in A Multipolar Strategic Ballistic Missile Defense World, *The Federation of American Scientists,* 2017, accessed April 17, 2020, https://calhoun.nps.edu/handle/10945/55822: see also Bruce W. MacDonald and Charles D. Ferguson, "Chinese Strategic Missile Defense: Will It Happen, and What Would It Mean?" November, 2015, accessed April 17, 2020, https://www.armscontrol.org/act/2015-11/features/chinese-strategic-missile-defense-happen-what-mean

[1053] Ibid

[1054] Jeffrey Lewis, "They Shoot Satellites, Don't They," *Foreign Policy*, August 9, 2014, accessed April 8, 2020, https://foreignpolicy.com/2014/08/09/they-shoot-satellites-dont-they/

[1055] "China Flight-Tests Missile Interceptors," *Arms Control Today*, April 2021, accessed August 17, 2021, https://www.armscontrol.org/act/2021-04/news-briefs/china-flight-tests-missile-interceptors

[1056] Alicia Sanders-Zakre, "China Advances Ballistic Missile Defense," September 2017, https://www.armscontrol.org/act/2017-09/news-briefs/china-advances-ballistic-missile-defense

[1057] Ibid

[1058] Jeremy Chin, "China Conducts BMD Test with S-400," *Missile Threat,* Center for Strategic and International Studies, December 29, 2018, last modified April 8, 2019, https://missilethreat.csis.org/china-conducts-bmd-test-with-s-400/.

[1059] Minnie Chan, "China Plans Sea-Based Anti-Missile Shields 'for Asia-Pacific and Indian Ocean,'" February 8, 2018 accessed April 8, 2020, https://www.scmp.com/news/china/diplomacy-defense/article/2132615/china-plans-sea-based-anti-missile-shields-asia-pacific

[1060] Minnie Chan, "China plans sea-based anti-missile shields 'for Asia-Pacific and Indian Ocean'"

Some analysts believe that China is developing its own missile defense technology, and it could proceed with deployment in the future.[1061] Since February 2018, China has carried out five BMD tests.[1062] The most recent was in February 2021, the fifth successful test of the ground-based mid-course missile defense system.[1063] According to Li Bin, there are three possible future scenarios for China's BMD system.[1064] Firstly, China acquires, but does not deploy, a BMD system. Secondly, China builds a national missile defense (NMD) system – akin to the US GMD system – and deploys it for limited defense, and thirdly China deploys BMD interceptors for limited point-defense of its strategic assets, such as ICBMs and NC3 systems.[1065] He further argues that to limit the damage from a US first strike, China might require more interceptors than the US currently has to achieve the same result. Given the capabilities of both states, any such deployment by China would weaken the US deterrence capability or could motivate the US to deploy an additional layer of defensive or offensive capabilities and maintain a disarming strike capability in the future. China is also improving and expanding its early warning system, considered critical for an effective BMD system, as discussed earlier in the chapter.[1066] The ongoing developments in China's BMD capabilities, ASAT capabilities, and other crucial technologies are required for an operational missile defense system.

5.6 Incorporating New Technology

After the initiation of the 2015 reforms, the science and technology commission (S&TC), which used to work under General Armament Department (GAD), was disbanded. Now

[1061] Christopher P. Twomey and Michael S. Chase, "Chinese Attitudes Toward Missile Defense Technology and Capabilities," in Catherine M. Kelleher and Peter J. Dombrowski, eds., *Missile Defense: The Fourth Wave and Beyond*, (Stanford, Calif.: Stanford University Press, 2015)
[1062] "China Flight-Tests Missile Interceptors," *Arms Control Today*, April 2021, accessed May 25, 2021, https://www.armscontrol.org/act/2021-04/news-briefs/china-flight-tests-missile-interceptors
[1063] Ibid
[1064] Li Bin, "What China's Missile Intercept Test Means," Washington, D.C.: Carnegie Endowment for International Peace, February 4, 2013, https://carnegieendowment.org/2013/02/04/what-china-s-missile-intercept-test-means-pub-50833
[1065] Ibid
[1066] Vinayak Bhat, "Where do China's Missile Early Warning Capabilities Stand? Eye in the Sky tells you," *India Today*, August 11, 2020, accessed August 17, 2021, https://www.indiatoday.in/world/story/china-missile-early-warning-capabilities-satellite-images-1709882-2020-08-11; Alexander Korolev, "China–Russia Cooperation on Missile Attack Early Warning Systems," *East Asia Forum*, November 20, 2020, accessed August 16, 2021, https://www.eastasiaforum.org/2020/11/20/china-russia-cooperation-on-missile-attack-early-warning-systems/; State Council Information Office, 2019; State Council Information Office, 2015; Richard Weitz, "China, Russia and Missile Diplomacy," *China & US Focus*, November 28, 2019, accessed August 11, 2021, https://www.chinausfocus.com/foreign-policy/china-russia-and-missile-diplomacy

the S&TC works directly under CMC as an independent organ.[1067] The S&TC is working on new and emerging technologies, such as hypersonic glide vehicles (HGV), artificial intelligence (AI), cyber warfare, and new strategic situational awareness systems. Collectively, these could reshape China's nuclear policies drastically and could boost China's nuclear capability to fight a war.

AI has the potential to create windows of opportunity for a successful decapitation strike if harnessed effectively.[1068] AI could enable autonomous platforms and technologies such as drone swarms, autonomous robots, machine learning, big data mining, and other techniques to gather and process intelligence, leading to a capability with a greater chance of delivering a successful attack against nuclear and related targets using nuclear or precision-guided conventional missile technology.[1069] If China gains the upper hand in AI development and deployment, it would increase the credibility of China's nuclear deterrence and may give it a first-strike advantage. AI can also provide faster anticipation and response to an incoming attack.[1070] Similarly, other AI-enabled platforms, such as autonomous underwater drones, could help states gather information on nuclear submarines of the adversary, deliver sensors and identify locations leading to early destruction of SSBNs during a conflict.[1071] This could cripple a state's second-strike capability.

In a testimony for the Senate Armed Services Committee on April 29, 2021, Defense Intelligence Agency, Director Lt. Gen. Scott D. Berrier stated that by 2035 China aims to introduce disruptive technologies into its defense forces. It is among the leaders in AI, high-performance computing, quantum information, and advanced robotics.[1072] In 2017, China published its first national AI development strategy titled "New Generation Artificial Intelligence Development Plan," according to which it aims to become the

[1067] Marcus Clay, "The PLA's New Push for Military Technology Innovation," *The Diplomat*, October 31, 2020, accessed May 26, 2021, https://thediplomat.com/2020/10/the-plas-new-push-for-military-technology-innovation/
[1068] "How Artificial Intelligence Could Increase the Risk of Nuclear War," *The RAND Blog*, April 24, 2018, accessed January 17, 2022, https://www.rand.org/blog/articles/2018/04/how-artificial-intelligence-could-increase-the-risk.html
[1069] Zachary Kallenborn, "AI Risks To Nuclear Deterrence Are Real," *War on the Rocks*, October 10, 2019, accessed August 17, 2021, https://warontherocks.com/2019/10/ai-risks-to-nuclear-deterrence-are-real/
[1070] Lora Saalman, "The Impact of AI on Nuclear Deterrence: China, Russia, and The United States," *East-West Center*, April 14, 2020, accessed September 11, 2020, https://www.eastwestcenter.org/news-center/east-west-wire/the-impact-ai-nuclear-deterrence-china-russia-and-the-united-states
[1071] Ibid
[1072] John A. Tirpak, "DIA Says China's Weapon Technology Advancing Fast While Russia Falls Behind," *Air Force Magazine*, April 30, 2021, accessed June 10, 2021, https://www.airforcemag.com/dia-says-chinas-weapon-technology-advancing-fast-while-russia-falls-behind/

world leader in AI by 2030.[1073] The US is leading in absolute terms, whereas China seems to be fast-tracking and progressing faster than the US along some metrics. China is spending tens of billions of dollars on AI.[1074] Following China's heavy investments, the US Senate approved a funding of $81 billion for the National Science Foundation for the next five years.[1075] China is assessed to be leading in two AI categories: adoption and data; whereas the US maintains the lead in four categories: talent, research, development, and hardware.[1076]

China's cyber warfare strategy is well known, aimed at information penetration, account hijacking, and secret sabotage.[1077] After the 2015 reforms, the PLA Cyberspace operation department was formed which works directly under the SSF.[1078] It has three domains: a cyber army responsible for offensive and defensive operations; an aerospace force responsible for reconnaissance satellites and navigation satellites; and electronics units in charge of disrupting enemy satellites and communications.[1079]

China is also making rapid progress on other crucial defense technologies. For example, on October 1, 2020, on the founding day of the People's Republic of China, China showcased the DF-17 HGV in the parade. The DF-17 has an estimated range of 2,000km. It can carry both conventional and nuclear maneuverable warheads and penetrate missile defenses with greater impunity due to its maneuverability.[1080]

[1073] Huw Roberts, Josh Cowls, Jessica Morley, Mariarosaria Taddeo, Vincent Wang and Luciano Floridi, "The Chinese Approach to Artifcial Intelligence: An Analysis of Policy, Ethics, and Regulation," *AI and Society*, Vol. 36, (2021), 59-77

[1074] Gregory C. Allen, "Understanding China's AI Strategy," *Center for a New American Security*, February 6, 2019, accessed June 9, 2021, https://www.cnas.org/publications/reports/understanding-chinas-ai-strategy

[1075] Ariana Remmel, "Massive Science-Funding Bill Passes US Senate: but China Focus Worries Researchers," *Nature*, June 11, 2021, accessed January 17, 2022, https://www.nature.com/articles/d41586-021-01559-x

[1076] Reuben Steff and Khusrow A. Abbasi, "Artificial Intelligence and the Military balance of Power" in Reuben Steff, Joe Burton and Simona R. Soare, eds. *Emerging Technologies and International Security: Machines, the State and War* (New York, Routledge, 2021), 65-78

[1077] "The Asia-Pacific Regional Security Assessment 2019: Key developments and trends" (London, *IISS*, 2019), 77-90; "Military and Security Developments Involving the People's Republic of China 2021," 79

[1078] "NIDS China Security Report 2021 China's Military Strategy in the New Era," *The National Institute for Defense Studies*, November 2020, accessed January 17, 2022, http://www.nids.mod.go.jp/publication/chinareport/pdf/china_report_EN_web_2021_A01.pdf; Michael Raska, "PLA reforms: Toward winning 'informationised local wars'" *The Interpreter*, February 3, 2016, accessed January 17, 2020, https://www.lowyinstitute.org/the-interpreter/pla-reforms-toward-winning-informationised-local-wars; Suyash Desai, "PLA SSF: Why China will be Ahead of Everyone in Future Cyber, Space or Information Warfare," *The Print*, December 31, 2019, accessed January 17, 2022, https://theprint.in/opinion/pla-ssf-why-china-will-be-ahead-of-everyone-in-future-cyber-space-or-information-warfare/342772/

[1079] Ibid

[1080] Kristensen and Korda, "Nuclear Notebook: Chinese nuclear forces," 2021

China's investment in strategic situational awareness (SSA) systems is considerable. The systems will improve China's ability to understand the operational environment, including adversary's military capabilities, early detection of attacks, discerning real attacks from false alarms across the nuclear and conventional domains. To improve SSA systems, China is increasing the number of remote sensing satellites for electronic intelligence (ELINT), phased-array and other sophisticated radars, and early warning aircraft and unmanned platforms.[1081] China's 2015 Defense White Paper notes, "China will optimize its nuclear force structure, improve strategic early warning, command and control, missile penetration, rapid reaction, and survivability and protection."[1082] The 2019 Defense White Paper also posits that China is improving its strategic early warning and information countermeasure capabilities.[1083] According to Russian news agency *TASS*, President Vladimir Putin, on October 4, 2019, while addressing a Valdai International Discussion Club session, stated that Russia had helped China "develop its national missile attack early warning system."[1084] An improved early warning system, according to US estimates, could help China evolve its nuclear posture to launch-on-warning, a posture consistent with its NFU policy.[1085] The PLA also intends to build a space-based strategic surveillance system, which could assist in the early identification of potential conventional and nuclear attacks.[1086]

The chapter, so far, has examined China's nuclear policy, its nuclear deterrence and strategy, and its ongoing nuclear weapons force modernization. In the light of the above discussion, the next section critically examines changes in the nuclear warfighting doctrine. However, before comprehending it, it is important to define the parameters of

[1081] Mark Stokes, Gabriel Alvarado, Emily Weinstein, and Ian Easton, "China's Space and Counterspace Capabilities and Activities," *The U.S.-China Economic and Security Review Commission*, March 30, 2020, accessed January 17, 2022, https://www.uscc.gov/sites/default/files/2020-05/China_Space_and_Counterspace_Activities.pdf; Felix K. Chang, "China's Maritime Intelligence, Surveillance, and Reconnaissance Capability in the South China Sea," *Foreign Policy Research Institute*, May 5, 2021, accessed January 17, 2022, https://www.fpri.org/article/2021/05/chinas-maritime-intelligence-surveillance-and-reconnaissance-capability-in-the-south-china-sea/; Ian Easton and Mark A. Stokes, "China's Electronic Intelligence (ELINT) Satellite Developments: Implications for U.S. Air and Naval Operations," *The Project 2049 Institute*, February 23, https://project2049.net/wp-content/uploads/2018/05/china_electronic_intelligence_elint_satellite_developments_easton_stokes.pdf

[1082] The State Council Information Office, 2015

[1083] The State Council Information Office, 2019

[1084] "China's New Missile Warning System to Reduce the Probability of Big War, say Russian Experts," October 5, 2019, accessed February 20, 2020, https://tass.com/defense/1081529

[1085] Office of the Secretary of Defense, "Military and Security Developments Involving the People's Republic of China 2019"; The 2013 SMS

[1086] Elsa Kania, "China's Strategic Awareness Capabilities," July 29, 2019, accessed February 20, 2020, https://ontheradar.csis.org/issue-briefs/china-situational-awareness/#fn:2

nuclear warfighting. Doing this will enhance our understanding of China's own nuclear warfighting doctrine and how it informs US nuclear doctrine.

5.7 The Framework of Nuclear Warfighting

Deterrence and warfighting are interconnected; the former's efficacy depends on the credibility and ability to retaliate overwhelmingly in the wake of a strike by an adversary. This is known as deterrence by punishment, which may involve different strategies and objectives. The academic debates and discussions on deterrence are predominantly focused on pre-war deterrence, and that, according to Colin Gray, "leads to the neglect of operational strategy."[1087] As a dynamic concept, deterrence evolved as the Cold War evolved from Albert Wohlstetter's 'delicate balance of terror' to Herman Kahn's contextual deterrence, commonly referred to as tailored deterrence.[1088] Kahn also profoundly considered the nature of nuclear wars and how to fight one.[1089]

Gray, Kahn and Wohlstetter were nuclear warfighting theorists. Unlike many other analysts in the US, they believed MAD was not acceptable as theorists who focused on deterrence by punishment could not satisfactorily address the questions related to scenarios whereby deterrence failed and nuclear war had to actually be fought and won.

Nuclear warfighting theorists' forays into theory enabled them to develop and explore new countervailing strategies, and in doing so, they explored how to fight and win a nuclear war.[1090] For the proponents of warfighting theory, the strategy does not end at just a deterrence capability that allows a minimum level of retaliation.[1091] The sole purpose of a deterrence strategy, in their view, was, and is not, only to be to prevent war or reinstate deterrence should conflict occur. War should serve, what Karl von Clausewitz calls, the purpose of the policy.[1092] For Clausewitz, "strategy is the use of engagements

[1087] Colin S. Gray, "Nuclear Strategy: The Case for a Theory of Victory," *International Security*, Vol. 4, No. 1, (Summer 1979), 62
[1088] Albert J. Wohlstetter, "The Delicate Balance of Terror," *Foreign Affairs*, Vol. 37, (1959) 211-234; also see Herman Kahn, *On Thermonuclear War* (Princeton, N.J.: Princeton University Press, 1960); Herman Kahn, *On Escalation: Metaphors and Scenarios* (London: Pall Mall Press, 1965)
[1089] Ibid
[1090] Gray and Payne, "Victory is Possible," 14-27; Colin S. Gray, "War-Fighting for Deterrence," *Journal of Strategic Studies*, Vol. 7, No. 1, (Summer 1980), 5-28
[1091] Gray, "Nuclear Strategy"; Wohlstetter, [not in biblio]"The Delicate Balance of Terror"; Grey and Payne, "Victory is possible"; Grey, "War-Fighting for Deterrence"
[1092] Carl von Clausewitz, *On War* (Princeton, N.J.: Princeton University Press, 1978), 87

for the purpose [fighting] of war," or in other words, for a warfighting strategy, a state requires a warfighting doctrine and capability to enact it.[1093]

For warfighting theorists, surviving and winning is the key objective in a nuclear war, and preferred strategies are damage limitation and successfully achieving intra-war deterrence. A damage limitation strategy aims to defend the people, territory, and infrastructure by defeating the adversary's attacks and limiting intended damage to the extent possible.[1094] Intra-war deterrence is an effort dedicated to controlling escalation in a war using the threat of the use of additional military force, mainly involving nuclear weapons, should the adversary cross a certain threshold.[1095] The objective is to force the enemy to back down amidst a nuclear conflict, signaling that credible escalation is on the table and that the US had capabilities that would allow it to escalate the conflict to a level that would be intolerably costly to the adversary, and thus a cost-benefit analysis would force the adversary to concede and back out of the conflict.

However, states involved in a destructive war might not adopt a restrained approach; they may see the complete destruction of the adversary as the necessary and ultimate objective key to stop the war's continuation. This could make fighting a nuclear war in a 'restrained' and 'balanced' way in which both sides signal and moderate their tit-for-tat responses impossible. This is why scholars such as Jeffrey Larsen explain that nuclear warfighting requires a mature and flexible nuclear inventory.[1096] Finally, warfighting theorists also assert that a capability to fight and win a nuclear war will, itself, be the best mechanism to ensure deterrence – Who would start a fight with the US or its allies in the first place if they were certain to lose?

The following section outlines the reasons that motivate scholars and strategists to try to obtain a nuclear warfighting strategy: "enhancing deterrence credibility, dealing with the

[1093] Ibid., 128
[1094] Baker Spring, "Congressional Commission should recommend 'Damage Limitation' Strategy," *The Heritage Foundation*, August 14, 2008, accessed September 17, 2020, https://www.heritage.org/defense/report/congressional-commission-should-recommend-damage-limitation-strategy#:~:text=A%20damage%20limitation%20strategy%20would,to%20the%20greatest%20extent%20possible.
[1095] W. Andrew Terrill, "Escalation and Intrawar Deterrence during Limited Wars in the Middle East," September 2009, accessed September 17, 2020, https://www.globalsecurity.org/military/library/report/2009/ssi_terrill02.pdf
[1096] Jeffrey A. Larsen, "Limited War and the Advent of Nuclear Weapons," in Jeffrey A. Larsen and Kerry M. Kartchner, eds. *On Limited Nuclear War in the 21st Century*, (Stanford University Press, 2014), 12-14

failure of deterrence, damage limitation, a theory of victory, and adhering to a just-war tradition."[1097]

5.7.1 Enhancing Pre-War Deterrence Credibility

Deterrence is most credible when the threat to use force to respond to an undesired military attack is credible. Credibility must be maintained across different contexts and multiple levels. Freedman views deterrence credibility as existing in both a "general and immediate sense."[1098] The former operates in the framework of normal security relations and during peacetime, while the latter must work during an existing crisis environment where the threat is explicit and time-sensitive. Notwithstanding some disagreements in the fourth wave of deterrence theory literature, many scholars do agree that a 'one size fits all' approach to deterrence cannot be relied upon in the contemporary and more complex security environment.[1099] As such, credible deterrence must be based upon a flexible deterrence posture based on different responses and capabilities because the changing security environment leads to change in the factors affecting deterrence.[1100]

Extended deterrence is challenging when a state tries to credibly claim that they will launch a nuclear response in case of a nuclear attack on a close ally, more specifically, when such a claim involves nuclear weapon states, which could lead to rapid escalation and end in a total nuclear war.[1101] For example, the US extends nuclear deterrence over some of its close allies, such as Japan and South Korea, against an adversary's possible nuclear threat or attack.[1102] To provide a credible extended nuclear deterrence guarantee, a state, therefore, needs the capability to fight and win a limited nuclear war and manage escalation in regions sometimes far from its homeland. It is the threat of total nuclear war that underwrites the deterrence strategy. Moreover, compared with conventional

[1097] Lonsdale, "The 2018 Nuclear Posture Review: A return to nuclear warfighting," 101; also see Gray, "Nuclear Strategy: The Case for a Theory of Victory," 54-87; Gray and Payne, "Victory is Possible," 14-27; Gray, "War-Fighting for Deterrence," 5-28

[1098] Lawrence Freedman, *Deterrence* (Cambridge: Polity Press, 2004), 39-44

[1099] J. W. Knopf, "The Fourth Wave in Deterrence Research," *Contemporary Security Policy*, Vol. 31, No. 1, (2010), 1-33; also see C. Poppe et al., *Whither Deterrence? Final Report of the 2001 Futures Project*, (Livermore, CA: Lawrence Livermore National Laboratory) May 1, 2002, 17-18; Michael Quinlan, "Deterrence and Deterrability," *Contemporary Security Policy*, Vol. 25, No. 1, (2004) 17; James Wirtz, "Disarmament, Deterrence, and Denial," *Comparative Strategy*, Vol. 24, No. 5, (2005), 384

[1100] Keith Payne, "Nuclear Deterrence in a New Age," *Comparative Strategy*, Vol. 37, No. 1, (2018) 1-8; also see Keith Payne and John Foster, Jr., "Nuclear Force Adaptability for Deterrence and Assurance: A Prudent Alternative to Minimum Deterrence," *Comparative Strategy*, Vol. 34, No. 3, (2015), 247-309

[1101] Gray, "Nuclear Strategy: The Case for a Theory of Victory"

[1102] Austin Long, "Nuclear Strategy in an Era of Great Power Competition, Policy Roundtable: The Trump Administration's Nuclear Posture Review," *Texas National Security Review*, February 13, 2018, https://tnsr.org/roundtable/ policy-roundtable-trump-administrations-nuclear-posture-review/#_ftn108

deterrence, nuclear deterrence strategies must be devised to try avoid war, as Brodie argued.[1103] In such a scenario, according to proponents of nuclear warfighting, the threat of nuclear conflict could be especially costly (when deterrence fails) if the doctrine and capability to fight and win a nuclear war do not exist. Therefore, a nuclear deterrent threat without a strategy and capability that allows for successful nuclear warfighting is negligent and less effective than a threat backed by a purposeful credible warfighting strategy. The warfighting is not merely related to nuclear strategy for carrying out a nuclear strike; instead, it becomes a useable instrument of policy in itself. Such an approach, arguably, bolsters deterrence because it will reduce the incentives for other states to violate US red lines (such as attack or coerce US allies). It also enhances the resolve of the US to intervene (and the perception that it will in the eyes of its adversaries), making its nuclear threats more credible, enhancing its capacity to control escalation, and, more importantly, to achieve the political objectives it has set itself if deterrence fails.

5.7.2 **Failure of Deterrence**

A second element that motivates some scholars to support the need for a nuclear warfighting strategy is their concerns about what happens if deterrence fails. Even Brodie recognized that deterrence could fail. [1104] Therefore, warfighting theorists concluded, a deterrence strategy must embrace a warfighting strategy.[1105] It is on this premise that Gray wrote, "whatever the pre-war feelings, thinking, and even instincts, of a politician, may have been, in the event of war it is safe to predict that he would demand a realistic war plan."[1106] Though a deterrence strategy seeks to avoid conflict, a strategy that does not prepare for warfighting is strategic neglect. Brodie wrote, "so long as there is a finite chance of war, we have to be interested in outcomes; and although all outcomes would be bad, some would be very much worse than others."[1107] War must be waged as a means to achieve policy objectives once deterrence fails. A capability to launch a limited nuclear war reinforces the feasibility of deterrence during the intra-war period as calculated nuclear responses and options provide the means for intra-war coercion, and therefore attempts to reinstate general deterrence should it break down. Many reasons can lead to

[1103] Bernard Brodie, "The Development of Nuclear Strategy," *International Security*, Vol. 2, No. 4, (1978), 65-83
[1104] Barry H. Steiner, *Bernard Brodie and the Foundations of American Nuclear Strategy* (Lawrence: University of Kansas Press, 1991), 241-244
[1105] Gray and Payne, "Victory is Possible," 19
[1106] Gray, "Nuclear Strategy: The Case for a Theory of Victory," 57
[1107] Bernard Brodie, *Strategy in the Missile Age* (Princeton, N.J., Princeton University Press, 1959), 278

a failure of deterrence; an adversary might be willing to bear the brunt of war, pay any price to achieve desired political objectives, or perhaps rational decision-making is restrained by factors such as dysfunctional organizational behavior, parochial strategic culture poor or irrational leadership, or intelligence failure.[1108]

Moreover, a technological opportunity, operational surprise, accidental or unauthorized launch of the war, and miscalculation of a situation can also lead to deterrence failure. Warfighting, therefore, is a strategy based on a realistic assumption that war is possible given the failure of deterrence could occur. Thus, deterrence strategy is incomplete without a warfighting strategy, which includes capabilities for damage limitation and to be able to practice intra-war deterrence – to 'end' a conflict before it escalates to full-scale nuclear destruction.

5.7.3 **Damage Limitation**

The third factor in the case for nuclear warfighting is related to the post-deterrence scenario that argues for damage limitation. Whether conventional or nuclear, damage limitation is a key objective for a state in war. After all, if the US fought a nuclear war and 'won' in terms of delivering more damage against an adversary but lost hundreds of millions of American lives, would it really be a 'victory'? The objective of reducing costs to oneself can be achieved via defensive measures and/or by destroying the adversary's offensive capabilities. This would require advanced military capabilities, particularly if involved in a nuclear conflict. In nuclear warfighting, a state requires counter-force capabilities capable of destroying the adversary's advancing formations and penetrating the adversary's defense deployments. These capabilities may include, but are not limited to, strategic bombers, advanced hypersonic missiles, SLCMs, ICBMs, SLBMs with a minor CEP, and MIRVing capabilities to overwhelm the adversary's defense systems and destroy its offensive nuclear capabilities. The capabilities also include Space and Command, Control, Communication, and Computer, Intelligence, Surveillance, and Reconnaissance (SC4ISR) to detect and destroy SSBNs, mobile ICBMs, and C2 that may remain operational after initial salvos.

[1108] Keith Payne, *The Fallacies of Cold War Deterrence and a New Direction* (Lexington: University of Kentucky Press, 2001); also see Barry Wolf, *When the Weak Attack the Strong: Failures of Deterrence* (Santa Monica: RAND, 1991); Leon Wieseltier, "When Deterrence Fails," *Foreign Affairs*, Vol. 63, No. 4, (1985), 827-847; Patrick M. Morgan, *Deterrence: A Conceptual Analysis* (London: Sage Publications, 1977).

Air and missile defense systems can be a key further layer facilitating damage limitation efforts. However, in the event of war between great powers such as the US and China, it is unlikely that either state would be able to take out all the nuclear weapons of the other but given the stakes involved both are sensitive that this could be a future capability for the other; China, especially, given its relative capability inferiority, is sensitive to America's advancing offensive and defensive capabilities. A combination of both offensive and defensive measures is necessary for a successful nuclear warfighting strategy to be conceived and, if necessary, employed should a nuclear war occur. The damage-limitation approach also enhances the efficacy of deterrence by denial (deterring an act by making it impractical and unlikely to succeed) and deterrence by punishment (threat of punishment based on delivering an unacceptable level of damage) as a state's perceived vulnerability of its nuclear forces would deter it from escalating a war.

5.7.4 **The Theory of Victory**

The theory of victory is another significant element underpinning a nuclear warfighting strategy. Some scholars reject the idea that victory can be achieved in a nuclear war because of the excessive collateral damage that would likely ensue; this means even the 'rational' idea that winning a nuclear war is possible should be rejected outright, as it could lead to an irrational outcome – mass death and destruction.[1109] But proponents of warfighting argue that a nuclear war might not lead to total destruction or nuclear Armageddon.[1110] A warfighting strategy intends to offer a range of options for a graduated set of responses (that could allow intra-war deterrence) in the hopes that it can prevent the worst-case scenario – nuclear warfighting. This is why, during the Cold War, Gray writes, "one of the essential tasks of the American defense community is to help ensure that in moments of acute crisis the Soviet general staff cannot brief the Politburo with a plausible theory of military victory."[1111] More contentious, however, is to argue that a pyrrhic victory is achievable in a nuclear war. Whatsoever the case may be, prospects for victory, according to theorists, should be governed by strategy.[1112] The theory of victory offers general guidelines, and identifies the objectives of the policy and

[1109] Barry H. Steiner, *Bernard Brodie and the Foundations of American Nuclear Strategy* (Lawrence: University of Kansas Press, 1991), 240-245; Bernard Brodie, *Strategy in the Missile Age* (Princeton, N.J., Princeton University Press, 1959), 265-276
[1110] Gray, "Nuclear Strategy: The Case for a Theory of Victory"; Gray and Payne, "Victory is Possible"
[1111] Gray, "Nuclear Strategy: The Case for a Theory of Victory," 56
[1112] Gray and Payne, "Victory is Possible"

military goals, as Gray notes, in the later stage of the Cold War, the "U.S. nuclear strategy increasingly focused on targets associated with the political control of the Soviet state."[1113]

The question arises of whether a nuclear warfighting strategy can work during a nuclear war. For Lawrence Freedman, nuclear weapons are *astrategic* in nature, in relation to rational policy outcomes. Damage limitation to some degree might be a feasible objective, yet the pursuit of total victory is absurd.[1114] However, no one denies that deterrence could fail. Scholars such as Kahn have argued that there has to be a choice besides just the negative choice of extinction and submission.[1115] The warfighting strategy seeks to create a rational purpose and prospect of a successful nuclear war, guided by the need to prevail during a nuclear war short of pushing the conflict to the level of total nuclear war and Armageddon.

5.7.5 **Just War**

Lastly, the just war theory is argued as being another rationale for a warfighting strategy. A just war includes the moral principle that destruction should be minimized during wartime. However, moral concerns do not forbid the use of violence. Gray asserts that the tradition emphasizes that war be waged for a better future, with the logical anticipation of winning, using selective engagement with discrimination and ensuring proportionate responses.[1116] These principles of a just war are also required for a nuclear warfighting approach.[1117] According to Lonsdale, warfighting is morally as legitimate as deterrence. He notes, "the moral legitimacy of deterrence (avoiding war) can be extended to warfighting, because the primary intention to deter requires a secondary intention to use."[1118] During the Cold War, MAD was premised on counter-value targets, assuring that the adversarial state ceases to exist as a viable socio-political entity.[1119] In the absence of a warfighting strategy, nuclear deterrence rested upon rudimentary massive counter-value punishment strikes against industrial cities and population centers.

[1113] Gray, "Nuclear Strategy" quoted in Lonsdale, *The 2018 Nuclear Posture Review: A return to nuclear warfighting*, 103
[1114] Freedman, "The Evolution of Nuclear Strategy"
[1115] Kahn, *On Thermonuclear War*, 96-116
[1116] Gray, "War-Fighting for Deterrence," 17
[1117] Clausewitz, *On War*, 74-79
[1118] Lonsdale, *The 2018 Nuclear Posture*, 104
[1119] Ibid; R. R. Dipert, "The Ethics of Cyberwarfare," *Journal of Military Ethics*, Vol. 9, No. 4 (2010), 394; Gray, War-Fighting for Deterrence, 17

Contrary to this, in the presence of a warfighting strategy, deterrence rests on counter-force (military) targets such as nuclear command, control, and communication centers. The objective is to break the will of the enemy's armed forces by eliminating the capability to fight. However, this does not mean that warfighting as a strategy does not have ethical issues. For example, threatening and preparing for the nuclear war itself is unethical, making war more likely.[1120] Moreover, counter-force deployments could threaten the adversary's retaliatory deployments, which Thomas Schelling views as essential to maintaining "the reciprocal fear of surprise attack."[1121] This could undermine deterrence which provides a stable basis for great power competition to occur without devolving into outright war. As such, a warfighting strategy and associated capabilities designed by one side to strengthen deterrence (direct and external) might undermine deterrence because the other side becomes convinced that the capabilities suggest first-strike intentions. Thus, the morally least legitimate outcome or nuclear war might eventuate.

5.8 China's Evolving Nuclear Deterrent Spectrum: From NFU to a Warfighting Doctrine

As this chapter has outlined, China has introduced qualitative and quantitative reforms to its strategic forces. With the introduction of improved short, medium, and long-range mobile solid-fuelled missiles capable of MIRVing, an emerging fleet of SSBNs coupled with long-range SLBMs, and a reassigned nuclear role for the PLAAF, China is on the verge of achieving an operational nuclear triad. A nuclear triad can be considered a requirement for great military power status in the contemporary environment, and as a result of China's threat perception (which sees more significant threats in both the regional and global environment), its geostrategic location, and growing interests, China has probably concluded it needs to acquire a fully-functional nuclear triad.

China's nuclear force modernization ambitions can be viewed from two angles: China is striving to achieve a nuclear warfighting capability that might offset US conventional superiority (pre-war deterrence credibility), and China is expanding its strategic forces to eliminate its nuclear disparity with the US, so that if deterrence fails, China has the means to retaliate with nuclear weapons. China views its force modernization process as being

[1120] Michael Novak, *Moral Clarity in the Nuclear Age* (Nashville: Thomas Nelson, 1983), 37, 97
[1121] Thomas C. Schelling, *The Strategy of Conflict* (Cambridge: Harvard University, 1980), 206-229

motivated to increase its deterrence capability against the US. However, doing this could undercut US extended deterrence commitments to US allies in the region and reduce its global influence. Like those in the US throughout the Cold War (and still today for that matter) that believed having nuclear forces that could credibly fight a nuclear war and that could ensure escalation dominance was essential to guaranteeing deterrence (in other words, a maximal policy was required for deterrence rather than a minimal one), some Chinese strategists may be coming to a similar conclusion.

According to Defense White Papers, China's nuclear force modernization is driven by the strategic compulsion to maintain a secure *nuclear counterattack* capability against the advancing capabilities of the US that might challenge the former's nuclear deterrent capability. Some analysts believe China's distinctive NFU has restrained China's current nuclear weapons policy and its force modernization. Jeffery Lewis writes that China's nuclear weapons policy, at large, is less dependent on threat perception. It is more dependent on a distinctive view that China can deter adversaries if it preserves counterstrike capability with just a few or even *one* nuclear warhead.[1122] Marshall Nie Rongzhen (Mao's confidant responsible for China's nascent nuclear weapons program) viewed this approach as "the minimum means of reprisal."[1123] But this dictum may now be changing when we take into account China's contemporary ambitions, and the expensive nuclear force modernization. This raises intriguing questions: Why is China seemingly giving up the 'minimum means of reprisal' and Why is it expanding and modernizing the PLARF, the PLAN, and the PLAAF for more significant nuclear roles?

Some research highlights that China's historical approach towards nuclear weapons use has not changed fundamentally.[1124] According to these scholars, China has maintained a doctrine of assured retaliation, and it is likely to follow this *relatively* restrained doctrine while pursuing nuclear force modernization.[1125] Some Chinese scholars view China's nuclear weapons policy through a lens of minimum nuclear deterrence doctrine and a doctrine of limited deterrence.[1126] However, an assured retaliation doctrine is based on all

[1122] Michael Glosny, Christopher Twomey and Ryan Jacobs, U.S.-China Strategic Dialogue Phase VIII Report, Naval Postgraduate School, December 2014, accessed August 21, 2021, https://www.researchgate.net/publication/273908613_US-China_Strategic_Dialogue_Phase_VIII_Report
[1123] Jeffrey Lewis, *The Minimum Means of Reprisal China's Search for Security in the Nuclear Age* (Cambridge, Mass.: MIT Press, 2007), 1
[1124] M. Taylor Fravel and Evan S. Medeiros, "China's Search for Assured Retaliation: The Evolution of Chinese Nuclear Strategy and Force Structure," *International Security*, Volume 35, Issue 2, (2010) 48-87
[1125] Ibid
[1126] Xia, "China's Nuclear Doctrine: Debates and Evolution"; Moreover, some of the Chinese interlocutors in recent Track-1.5 and Track-2 dialogues with the US maintained that China could threaten the US credibly

available means of retaliation to assure retaliation. In other words, the fundamentals of assured retaliation doctrine are founded on the threat of fighting a nuclear war to deter with whatsoever means are available, albeit in retaliation to a first strike. An assured retaliation doctrine is fundamentally different from a nuclear warfighting doctrine, which China is struggling to achieve the capability to threaten with nuclear war to deter. As both doctrines require the capability to fight a nuclear war, the mere change in the nuclear doctrine would not be a huge challenge for China. Moreover, force modernization would allow China to target the mainland US and its bases in the Pacific from mainland China and its shores, as discussed above, suggest that China is on the trajectory of, in Xi's words, "fighting and winning the great war."[1127]

Other observers believe China keeps its nuclear weapons in a de-mated position, reinforcing its commitment to maintaining limited strategic objectives.[1128] It is a compelling argument, but once China successfully operationalizes the early warning system effectively, it would be logical for China to keep some of its ICBMs, such as DF-41, in a mated position.[1129] This is because an early warning system will detect the trajectory and type of incoming missile, making it more viable for China to rapidly launch a counter-strike without losing its missiles to a first strike – in turn, this would strengthen China's deterrent. However, it can potentially lead to instability as the US might view these new capabilities as Chinese intent to achieve warfighting capability, hence pushing the US for the first strike in crisis. Also, China is continuously modernizing and expanding its SSBNs fleet(s) and SLBMs (the construction of type 096 SSBN was supposed to begin early this year, and JL-3 SLBM[1130] with the range of 9,000+km and likely a MIRVing capability is in the development phase[1131]), and carrying out deterrent

with "a few, handful, or even with 'one' nuclear warhead". Such a stance undermines China's own deterrence credibility and appears contradictory to efforts to achieve full-spectrum deterrence. Additionally, it may also give false hope to the policymakers in the US to believe in China's minimum deterrence approach, for more debate please see, Glosny et al.,

[1127] Xinhua, "China Focus: "Be ready to win wars," China's Xi orders reshaped PLA, *Xinhua Net*, August 1, 2017, accessed August 21, 2021, http://www.xinhuanet.com//english/2017-08/01/c_136491455.htm

[1128] Paul H. B. Godwin, "Potential Chinese Response to U.S. Ballistic Missile Defense," report 43, Stimson/CNA NMD-China Project, Stimson Center, January 17, 2002; Hans M. Kristensen, Robert S. Norris, and Matthew G. McKinzie, *Chinese Nuclear Forces and U.S. Nuclear War Planning* (Washington, D.C.: Federation of American Scientists and Natural Resources Defense Council, 2006); Bin and Zhao, "Understand Chinese Nuclear Thinking," 268

[1129] Kristensen and Korda, "Chinese Nuclear Forces 2020," 446

[1130] David Axe, "China's New Missile Submarines could Nuke America (or not)," January 15, 2020, accessed April 12, 2020, https://nationalinterest.org/blog/buzz/chinas-new-missile-submarines-could-nuke-america-or-not-114211

[1131] China Power Team. "How is China modernizing its nuclear forces?" *China Power*. December 10, 2019. Updated December 18, 2019, accessed April 12, 2020, https://chinapower.csis.org/china-nuclear-weapons/

patrols. However, to preserve its second-strike capability, China's SSBN deterrent patrols will require nuclear weapons on board in a mated position.[1132]

Moreover, it is interesting to note that the new nuclear-capable missile inventory, such as DF-41 and upcoming JL-3, are capable of MIRVing.[1133] These missiles require China to increase the number of nuclear weapons in its inventory. It is also shifting emphasis from land-based to sea-based nuclear forces. More importantly, it seems that China's leadership is confident of the sea-based nuclear force's operational capacity, and it has a command and control mechanism for sea-based nuclear forces.[1134]

There exist certain constraints reducing China's ability to achieve a nuclear warfighting capability. This includes difficulties related to the miniaturization of nuclear weapons, making them suitable for air-launched and ground-launched cruise missiles. The US 'miniature' nuclear weapons weigh just 130kg, while China's smallest nuclear warhead weighs 500kg.[1135] Further reducing the size of its nuclear weapons will require China to reduce the missile's circular error probability (CEP), which would be time-intensive and require further technical sophistication. The lower the CEP, the more precise the missile. Moreover, China has limited tritium and fissile material stockpiles. [1136] Additionally, China would require a flexible or de-centralized command and control system to ensure a nuclear warfighting capability, specifically the delegation of more authority to commanders of its SSBNs.[1137] The status of the delegation of authority is as yet unknown, China appears confident of continuous-at-sea-deterrence as it goes ahead with building the Type-96 SSBN.[1138] Additionally, no reference to damage limitation and a just war is made in any policy document, including DWPs.

[1132] China Power Team, "Does China have an Effective Sea-based Nuclear Deterrent?" *China Power* December 28, 2015, updated August 26, 2020, accessed August 21, 2021, https://chinapower.csis.org/ssbn/
[1133] Missile Defense Project, "DF-41 (Dong Feng-41 / CSS-X-20)," *Missile Threat, Center for Strategic and International Studies*, August 12, 2016, last modified October 8, 2019, accessed May 26, 2021, https://missilethreat.csis.org/missile/df-41/; Kristin Huang, "The JL-3: The New Missile 'Raising the Cost' of a US Fight with China," *SCMP*, January 24, 2021, accessed may 26, 2021, https://www.scmp.com/news/china/military/article/3118960/jl-3-new-missile-raising-cost-us-fight-china
[1134] Tong Zhao, "China's Sea-Based Nuclear Deterrent," *CEIP*, June 30, 2016, accessed January 17, 2022, https://carnegieendowment.org/2016/06/30/china-s-sea-based-nuclear-deterrent-pub-63909
[1135] David Logan, "Hard Constraints on China's Nuclear Forces," *War on the Rocks*, November 8, 2017, accessed May 26, 2021, https://warontherocks.com/2017/11/china-nuclear-weapons-breakout/
[1136] Ibid
[1137] David Logan, "PLA Reforms and China's Nuclear Forces," *Joint Force Quarterly*, Vol. 83, No. 4, (2016) 57-62; Logan, *Hard Constraints on China's Nuclear Forces*.
[1138] Hans M. Kristensen and Matt Korda, *Bulletin of the Atomic Scientists* 2020, Vol. 76, No. 6, (2020), 452

The ongoing nuclear force modernization program is drastically changing the character and configuration of China's nuclear forces. According to China's official policy, its nuclear weapons program is to ensure it can conduct a nuclear counterattack; in other words, it prioritizes deterrence. However, based on the aforementioned emerging capabilities, such as the nature of its force modernization, emerging new capabilities, and restructuring and introduction of new arms into the PLA, it appears that China's existing and emerging capabilities are more than what its declared nuclear weapons doctrine of nuclear counterattack (discussed above) requires. This suggests that China's nuclear threat perception is intense, requiring more capabilities than a secure second-strike capability would require. How much would be enough to address China's threat perception? Probably a level of capability that leads to a rough parity in the number of nuclear weapons of China vis-a-vis the US.

With the ongoing construction of missile silo fields, deployment of modified and new nuclear-capable (with MIRVing capability) land-based missiles, hypersonic glide vehicles, equipping the upcoming generation of SSBNs with long-range MIRVing capable SLBMs, and reassigning nuclear mission to the PLAAF, China appears to be working to increase the survivability of its nuclear forces. Such developments will also enhance China's ability to evade the limited number of existing US interceptors and help China shift towards deterrence based on a nuclear war-fighting capability. A nuclear warfighting capability would require China to have an operational nuclear triad, advanced early warning systems, robust nuclear command and control, a BMD system and ISR capabilities, which China is vigorously developing. Together these developments will strengthen China's *weishe* (deterrence and coercion) capabilities.

5.9 Conclusion

The chapter outlines China's current nuclear weapons policy and force modernization. It argues that China's nuclear weapons policy and force modernization process initiated in 2015 could profoundly impact China's emerging nuclear weapons use doctrine in the coming years. Based on the analysis of China's tangible military capabilities, the chapter concludes that there are compelling reasons to believe that China is seeking the capability to adopt a full-spectrum nuclear warfighting doctrine.

Table 11. Requirements for different Deterrence Posture

Nuclear Forces	Limited Deterrence/Assured Retaliation	Full-Spectrum Deterrence
Land-based	Minimum survivable missile force – for credible counter-value retaliation	Silo and road-mobile MIRV-capable ICBM force, capable of evading adversary's BMD
Sea-based	Not required	SSBNs with SLMBs (MIRV-capable)
Air-based	Not required	Strategic: Bombers Tactical: Aircraft with ALCM and ALBM (TNWs)

The table above indicates the capabilities required for limited deterrence/assured retaliation and full-spectrum deterrence for warfighting. China's emerging capabilities go beyond a minimum deterrent and NFU policy requirements, which only require a retaliatory capability. It appears that China is hedging – seeking capabilities to move beyond its current settings. However, there is no guarantee that China will shift to a nuclear warfighting posture until it does, but new capabilities will increase the chances and incentives for China to do so once it reaches a certain capability threshold and if its threat perception continues to intensity.

The existing literature on China's nuclear weapons doctrine significantly understates the increasingly dynamic and vibrant features of China's emerging nuclear warfighting doctrine.[1139] Most of the existing literature discusses China's nuclear weapons doctrine from a defensive and nuclear counterattack doctrine perspective.[1140] Some have discussed

[1139] James Mulvenon, "Chinese and Mutually Assured Destruction: Is China Getting MAD?," in *Getting MAD: Nuclear Mutual Assured Destruction, Its Origins and Practice*, ed. Henry D. Sokolski (Carlisle, PA: Strategic Studies Institute (SSI) of the U.S. Army War College, November 2004); John Costello and Joe McReynolds, *China's Strategic Support Force: A Force for a New Era* (Washington D.C., US Government Publishing Office, 2018); Liping Xia, "China's Nuclear Doctrine: Debates and Evolution, June 30, 2016," accessed March 13, 2020, https://carnegieendowment.org/2016/06/30/china-s-nuclear-doctrine-debates-and-evolution-pub-63967; James Mulvenon et al., *Chinese Responses to U.S. Military Transformation and Implications for the Department of Defense* (Santa Monica, CA: RAND Corporation, 2006); Li Bin and Tong Zhao, eds. *Understanding Chinese Nuclear Thinking* (Washington, D.C.: Carnegie Endowment for International Peace, 2016); Eric Heginbotham, Michael S. Chase, Jacob L. Heim, Bonny Lin, Mark R. Cozad, Lyle J. Morris, Christopher P. Twomey, Forrest E. Morgan, Michael Nixon, Cristina L. Garafola, Samuel K. Berkowitz, *China's Evolving Nuclear Deterrent: Major Drivers and Issues for the United States* (Santa Monica, Calif.: RAND Corporation, RR-1628-AF, 2017); Fiona Cunningham, "Nuclear Command, Control, and Communications Systems of The People's Republic of China," NAPSNet Special Reports, July 18, 2019, accessed January 28, 2020, https://nautilus.org/napsnet/napsnet-special-reports/nuclear-command-control-and-communications-systems-of-the-peoples-republic-of-china/

[1140] Michael S. Chase and Cristina L. Garafola, "China's Search for a Strategic Air Force," *Journal of Strategic Studies*, Vol. 39, (2016), No. 1; Fiona S. Cunningham and M. Taylor Fravel, "Dangerous Confidence? Chinese Views on Nuclear Escalation," *International Security*, Vol. 44, No. 2, (2019) 61-109; Zhao Tong and Li Bin, "The Underappreciated Risks of Entanglement: A Chinese Perspective," in James M. Acton, ed. *Entanglement: Russian and Chinese Perspectives on Non-Nuclear Weapons and Nuclear*

it from minimum deterrence and credible deterrence point of view, and some western analysts, moving a step further, viewed it as a nuclear doctrine of assured retaliation.[1141] However, with new developments in China's nuclear force modernization, the more benign characterization of China's nuclear weapons doctrine overlooks the trends of how China is seeking to combine nuclear and conventional capabilities and create a doctrine for supporting a de-facto warfighting policy that the new capabilities will allow.

China's 'old thinking' on warfighting has been persistently influenced by its nuclear modernization, and in the future, its nuclear weapons doctrine is also likely to be affected by its emerging nuclear and conventional warfare capabilities. Subsequently, China's emerging understanding of strategic deterrence involves a multi-layered cross-domain solution (CDS) for deterrence. This complicates the conceptual separation that has traditionally existed between nuclear and conventional domains, potentially reducing the probability of rational decision-making being possible for states during times of crisis because of the limited time available and uncertainty about the nature of the weapons deployed in a crisis. It will further encourage states involved in crises to skip steps on the escalation ladder to maintain or achieve escalation dominance; therefore, the incentive for pre-emption could increase.

Furthermore, several factors may induce China to lower the nuclear threshold, including China's changing threat perception of the US, the PLA's expanding combined military operations capabilities, comingling of conventional and nuclear missile forces, and deliberately maintaining strategic ambiguity on nuclear use. Together, these factors will help China institutionalize nuclear warfighting as its official nuclear weapons doctrine, should it choose to do so, which will have major implications for international security.

Risks (Washington, D.C.: Carnegie Endowment for International Peace, 2017), 47-76; Thomas Christensen, "The Meaning of the Nuclear Evolution: China's Strategic Modernization and U.S.-China Security Relations," *Journal of Strategic Studies*, Vol. 35, No. 4, (2012), 469-471; Office of the Secretary of Defense, "Annual Report to Congress: Military and Security Developments Involving the People's Republic of China 2017," May 15, 2017, accessed February 20, 2020, https://dod.defense.gov/Portals/1/Documents/pubs/2017_China_Military_Power_Report.PDF; Office of the Secretary of Defense, "Annual Report to Congress: Military and Security Developments Involving the People's Republic of China 2018," May 16, 2018, accessed February 20, 2020, https://media.defense.gov/2018/Aug/16/ 2001955282/-1/-1/1/2018-CHINA-MILITARY-POWERREPORT.PDF; Christian Conroy, "China's Ballistic-Missile Submarines: How Dangerous?" *The Diplomat*, 18 November 2013, http://nationalinterest.org/commentary/chinas-ballistic-missile-submarines-how-dangerous-9414

[1141] Fiona Cunningham and M. Taylor Fravel, "Assuring Assured Retaliation: China's Nuclear Posture and U.S.-China Strategic Stability," *International Security*, Vol. 40, No. 2, (2015) 7-50; M. Taylor Fravel and Evan S. Medeiros, "China's Search for Assured Retaliation: The Evolution of Chinese Nuclear Strategy and Force Structure," *International Security*, Vol. 35, No. 2, (2010), 48-87

The following chapter examines the impact of this emerging nuclear weapons doctrine on international security, primarily for the US, given that it is becoming locked in a power competition with China. The chapter examines how China's emerging nuclear weapons policy and force modernization affect the US nuclear weapons program and how the latter is responding to it. Chapter Seven will then shift focus to consider the implications for Japan and South Korea, both US allies and two regional states critical to the Northeast Asian regional security environment.

Chapter Six

China Nuclear Weapons Policy and Force Modernization: Implications for the US

6.1 Introduction

This chapter explores the implications of China's nuclear force modernization for international security, primarily exploring the strategic implications for the US. The chapter also addresses the question: Does China's nuclear modernization undermine US extended deterrence guarantees? This scholarship examines the issue at hand along three vectors: implications directly for the US nuclear posture, the implication for crisis stability and escalation, and, the implications for the US extended deterrence. To examine these implications, it is imperative to explore what US nuclear policy is. Therefore, the chapter first examines the 2018 US Nuclear Posture Review (NPR) – an important official document that articulates the US' contemporary nuclear threat perception, policy and strategy, and outlook. Subsequently, to critically appraise the NPR, the chapter uses the nuclear warfighting framework outlined in the previous chapter to undertake discourse analysis. The chapter also explores the implications of cyber for the US-China nuclear equation. It then considers the implications of China's nuclear force modernization and the changing US nuclear posture on crisis stability and escalation, which could have far-reaching implications. Lastly, the chapter considers the implications for US extended deterrence.

The chapter concludes that China's ongoing nuclear force modernization significantly influenced the 2018 NPR and persuaded the Trump administration to initiate further significant changes. This change is visible in the 2018 Trump administration NPR, and it could have severe and critical implications for international security, specifically for nuclear deterrence and strategic stability between the US and China. This chapter argues that emerging deterrence and strategic instability have caught both states in a security dilemma, a concept discussed and outlined in Chapter One (on pages 46-47), leading to an intensified nuclear arms race.

6.1.1 US views on China's Nuclear Force Modernization

The extent to which China's emerging nuclear force modernization influences the US' nuclear policy, especially ongoing changes to its nuclear weapons program, has been a

matter of great debate in the strategic studies literature.[1142] The US views nuclear weapons as an essential element of its global and regional influence. As such, its nuclear weapons policy and strategy have evolved over time as it has sought to try to retain its influence and ability to project power globally unimpeded after the Cold War.[1143] As outlined in Chapter Two, China was initially viewed during the Cold War as an enemy by Washington, and then as a counterbalance against the Soviet Union. Today, the US, under the Biden administration, like its Trump predecessor, considers China to be a key international player and its major great-power competitor.[1144] At a Munich Security Conference in February 2021, President Biden stated, "America is back…we must be prepared together for a long-term strategic competition…competition with China is going to be stiff."[1145] The US and other key Indo-Pacific states share common concerns about China's emerging military modernization. It is agreed that China's emerging military modernization and policies could undermine regional strategic stability and the US-led Indo-Pacific security architecture.[1146] At the extreme, the growth in China's power, including in the nuclear domain, could lead it to try to replace the existing order with one that privileges its own interests. In a worst-case scenario, war could be used towards this end.

[1142] Caitlin Talmadge, "The US-China nuclear relationship: Why competition is likely to intensify," B*rookings*, September 2019, accessed August 24, 2020, https://www.brookings.edu/research/china-and-nuclear-weapons/; Gerald C. Brown, "Understanding the Risks and Realities of China's Nuclear Forces," *Arms Control Association*, June 2021, accessed August 26, 2021, https://www.armscontrol.org/act/2021-06/features/understanding-risks-realities-chinas-nuclear-forces; John Grady, "U.S. Working to End Chinese Secrecy Around Nuclear Capabilities," *USNI*, October 15, 2020, accessed July 23, 2021, https://news.usni.org/2020/10/15/u-s-working-to-end-chinese-secrecy-around-nuclear-capabilities; Elbridge A. Colby, Abraham M. Denmark and John K. Warden, *Nuclear Weapons and U.S. China Relations: A Way Forward,* (Washington D.C.: Center for Strategic and International Studies, 2013); Bin and Zhao, "Understanding Chinese Nuclear Thinking; Jacob Stokes, China's Missile Program and U.S. Withdrawal from the Intermediate-Range Nuclear Forces (INF) Treaty," *U.S.-China Economic and Security Review Commission*, February 4, 2019, accessed August 24, 2021, https://www.uscc.gov/sites/default/files/Research/China%20and%20INF_0.pdf; Li Bin and Nie Hongyi, "An Investigation of China – U.S. Strategic Stability," *World Economics and Politics*, No. 2, (2008) 13-19. This article was originally published in the Chinese. Translated by George Kulacki.

[1143] David S. McDonough, "The evolution of American nuclear strategy," *The Adelphi Papers*, Vol. 46, 13-28

[1144] Emma Ashford, "Great-Power Competition Is a Recipe for Disaster," *Foreign Policy*, April 1, 2021, accessed January 18, 2022, https://foreignpolicy.com/2021/04/01/china-usa-great-power-competition-recipe-for-disaster/

[1145] Ibid

[1146] Nguyen Thi Thuy Hang, "The Rise of China: Challenges, Implications, and Options for the United States," *Indian Journal of Asian Affairs*, Vol. 30, No. 1/2 (June-December 2017), 47-64; Robert G. Sutter, "China's Rise: Implications for U.S. leadership in Asia," *Policy Studies 21*, East-West Center, https://www.files.ethz.ch/isn/26092/PS021.pdf; Robert J. Art, "The United States and the Rise of China: Implications for the Long Haul," *Political Science Quarterly*, Vol. 125, No. 3, 359-391

According to some analysts, the US pursued a mixed policy approach of hedging towards China after September 11, 2001, cooperating on areas of strategic interest and competing on others.[1147] On the one hand, the US tried to engage and bring China into the existing world order by believing that China would inevitably become a democratic country. In 2005, Robert B. Zoellick, Deputy Secretary of State of Bush Jr.'s administration, in remarks to the National Committee on US-China Relations, stated that "Being born ethnically Chinese does not predispose people against democracy – just look at Taiwan's vibrant politics… We can cooperate with the emerging China of today, even as we work for the democratic China of tomorrow."[1148] On the other hand, the US maintains a robust military capability to deter and defeat any military aggression by China against the US and its allies. The US NPR of 2002 highlighted this hedging strategy. However, US policies began to change after the perceived failure of its China engagement policy – a conclusion reached by the Trump administration in 2017 against the backdrop of China's continued militarization of the South China Sea (which began in 2013 and announcement of plans for comprehensive military modernization announced in December 2015) and claims that China was cheating on international trade while deepening repression and authoritarianism at home.[1149] Since China's military modernization has already been discussed in the previous chapter, the subsequent section explores the contours of the US

[1147] John Hemmings, "Hedging: The Real U.S. Policy Towards China?" *The Diplomat*, May 13, 2013, accessed August 1, 2020, https://thediplomat.com/2013/05/hedging-the-real-u-s-policy-towards-china/

[1148] Robert B. Zoellick, "Whither China: From Membership to Responsibility? Remarks to National Committee on U.S.-China Relations," September 21, 2005, accessed May 26, 2021, https://2001-2009.state.gov/s/d/former/zoellick/rem/53682.htm

[1149] From 2013- August 2019, China has artificially build more than 3,000 acres across the seven-disputed islands. Steven Stashwick, China's South China Sea Militarization Has Peaked, *Foreign Policy*, August 19, 2019, accessed May 27, 2021, https://foreignpolicy.com/2019/08/19/chinas-south-china-sea-militarization-has-peaked/; James Bacchus, Simon Lester, and Huan Zhu, "Disciplining China's Trade Practices at the WTO," *CATO Institute*, November 15, 2018, accessed December 16, 2020, https://euagenda.eu/upload/publications/untitled-199756-ea.pdf; Wayne M. Morrison, "China-U.S. Trade Issues," *CRS*, July 30, 2018, accessed December 18, 2020, https://sgp.fas.org/crs/row/RL33536.pdf; Jake Werner, "China Is Cheating at a Rigged Game," *Foreign Policy*, August 8, 2018, accessed December 12, 2020, https://foreignpolicy.com/2018/08/08/china-is-cheating-at-a-rigged-game/; Peter Beinart, "China Isn't Cheating on Trade," *The Atlantic*, April 21, 2019, accessed December 14, 2020, https://www.theatlantic.com/ideas/archive/2019/04/us-trade-hawks-exaggerate-chinas-threat/587536/; Carl Minzner, "China's deepening institutional decay," *East Asia Forum*, August 20, 2017, accessed December 11, 2020, https://www.eastasiaforum.org/2017/08/20/chinas-deepening-institutional-decay/; Suzanne Nossel, "How to Stop the Export of Authoritarianism," *Foreign Policy*, October 5, 2020, accessed December 9, 2020, https://foreignpolicy.com/2020/10/05/how-to-stop-the-export-of-authoritarianism/; Maya Wang, "China's Techno-Authoritarianism Has Gone Global: Washington Needs to Offer an Alternative," *Foreign Policy*, April 8, 2021, accessed January 2, 2022, https://www.foreignaffairs.com/articles/china/2021-04-08/chinas-techno-authoritarianism-has-gone-global

nuclear posture, following this by a critical analysis using the warfighting framework to measure the impact of China's military modernization on it.

6.2 US Nuclear Posture

The most recent NPR report, published by President Donald Trump's administration in 2018, is a more open account of US nuclear weapons capability and strategy for their employment than previous NPRs. The review indicates important changes in the nuclear weapons use policy for the US.[1150] For some analysts, the review reversed the US' position on nuclear weapons use (associated with NFU and use in retaliation only), taking it back to the nuclear warfighting posture of the Cold War.[1151] Though the Obama administration's 2010 NPR sanctioned a substantial increase in investment to maintain a viable nuclear weapons program and infrastructure, the role of nuclear weapons was limited to deterrence only.[1152] One key conclusion of the 2010 NPR notes,

> The United States will continue to strengthen conventional capabilities and reduce the role of nuclear weapons in deterring non-nuclear attacks, with the objective of making deterrence of nuclear attack on the United States or our allies and partners the sole purpose of U.S. nuclear weapons.[1153]

The 2010 NPR viewed the US nuclear weapons program as a means to promote 'global nuclear zero,' a proposal President Obama put forward in his Prague speech in 2009. According to neoclassical realists, he, as an individual leader, tried to decisively influence US policies when he declared that his administration would see "America's commitment

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[1150] Steven Miller, "Nuclear Battleground: Debating the US 2018 Nuclear Posture Review, Policy Brief No. 63," *Asia Pacific Leadership Network for Nuclear Non-Proliferation and Disarmament/Toda Peace Institute*, June 2018, accessed June 20, 2020, www. belfercenter.org/publication/nuclear-battleground-debating-us-2018-nuclear-posture-review; also see Francis Gavin, "Introduction: Must We Mean What We Say? Making Sense of the Nuclear Posture Review," *Texas National Security Review*, February 13, 2018, accessed June 20, 2020, https://tnsr.org/roundtable/policy-roundtable-trump-administrations-nuclearposture-review/#_ftn108

[1151] Ishaan Tharoor, "Trump's Nuclear Policy Is Taking us Back to the Cold War," *The Washington Post*, February 6, 2018, accessed June 20, 2020, www.washingtonpost.com/news/worldviews/wp/2018/02/06/trumps-nuclear-policy-istaking-us-back-to-the-cold-war/?utm_term¼.f49b3e4916a2; John Gower, "The Dangerous Illogic of Twenty-First-Century Deterrence Through Planning for Nuclear Warfighting," *Carnegie Endowment for International Peace*, March 6, 2018, accessed June 12, 2020, http://carnegieendowment.org/2018/03/06/dangerous-illogic-oftwenty-first-century-deterrence-through-planning-for-nuclear-warfighting-pub-75717

[1152] Scott D. Sagan and Jane Vaynman, "Introduction," in *Nonproliferation Review*, Special Edition 18, No. 1, (2011) 17-37; also see Aiden Warren, *The Obama Administration's Nuclear Weapon Strategy: The Promises of Prague* (Abingdon: Routledge, 2014); Lawrence Freedman, "Disarmament and Other Nuclear Norms," *The Washington Quarterly*, Vol. 36, No. 2, (2013) 93-108

[1153] Department of Defense, Nuclear Posture Review Report, April 2010, www.defense.gov/Portals/1/features/ defenseReviews/NPR/2010_Nuclear_Posture_Review_Report.pdf, viii

to seek the peace and security of a world without nuclear weapons."[1154] However, global nuclear zero remained only a wish and, instead, comprehensive modernization of the nuclear weapons program was approved by the Obama administration that seemed to be at odds with an agenda designed to decrease the salience of nuclear arms.[1155]It was, however, consistent with a hedging strategy.

Then President-elect, Donald Trump, made a statement in December 2016, threatening competitors with the nuclear arms race, stating that "let it be an [nuclear] arms race," and "we will outmatch them at every pass and outlast them all."[1156] The Trump administration discarded the prospects of nuclear zero, noting that the Treaty on the Prohibition of Nuclear Weapons (TPNW), opened for signature at the UN in 2017, was, in its judgment, fueled by "wholly unrealistic expectations of the elimination of nuclear arsenals without the prerequisite transformation of the international security environment."[1157] The TPNW is a new disarmament treaty that seeks a "comprehensive set of prohibitions on participating in any nuclear weapon activities," which includes "undertaking not to develop, test, produce, acquire, possess, stockpile, use or threaten to use nuclear weapons."[1158] The TPNW is different from the NPT, an arms control treaty that deals with the nuclear proliferation of nuclear weapons and related technologies and supports the peaceful use of nuclear technology.[1159]

The 2018 NPR positions nuclear weapons at the center of US national security strategy, as it declares, "U.S. nuclear capabilities make essential contributions to the deterrence of nuclear and non-nuclear aggression."[1160] As such, the 2018 NPR outlines an extensive plan for nuclear force modernization, including enhancement of the nuclear NC3, a new

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[1154] Ibid., vi-v; Ian Traynor, "Barack Obama launches doctrine for nuclear-free world, April 5, 2019," accessed June 15, 2020, https://www.theguardian.com/world/2009/apr/05/nuclear-weapons-barack-obama

[1155] James E. Doyle, "Nuclear Weapons: A Record that Falls Short of Lofty Ambitions," *Arms Control Association*, December 2016, accessed January 19, 2021, https://www.armscontrol.org/act/2016-11/features/nuclear-weapons-record-falls-short-lofty-ambitions

[1156] Ed Pilkington and Martin Pengelly, "'Let it be an arms race': Donald Trump appears to double down on nuclear expansion," *Guardian*, December 24, 2016, accessed August 26, 2021, https://www.theguardian.com/us-news/2016/dec/23/donald-trump-nuclear-weapons-arms-race

[1157] Office of the Secretary of Defense, *Nuclear Posture Review*, February 2018, https://media.defense.gov/2018/Feb/02/2001872886/-1/-1/1/2018-NUCLEAR-POSTURE-REVIEW-FINAL-REPORT.PDF, 72

[1158] *Treaty on the Prohibition of Nuclear Weapons*, Office of the Disarmament Affairs, UN, accessed August 26, 2021, https://www.un.org/disarmament/wmd/nuclear/tpnw/

[1159] Office of the Disarmament Affairs, *Treaty on the Non-Proliferation of Nuclear Weapons* (NPT), *United Nations*, accessed December 19, 2021, https://www.un.org/disarmament/wmd/nuclear/npt/#:~:text=The%20NPT%20is%20a%20landmark,and%20general%20and%20complete%20disarmament.

[1160] [1160] Office of the Secretary of Defense, *Nuclear Posture Review*, February 2018, https://media.defense.gov/2018/Feb/02/2001872886/-1/-1/1/2018-NUCLEAR-POSTURE-REVIEW-FINAL-REPORT.PDF

ICBM, a new long-range strategic bomber, an SSBN with nuclear-capable SLBM, and the development of low-yield weapons.[1161]

In 2019, the Trump administration withdrew from the Intermediate-Range Nuclear Forces (INF) Treaty signed in 1987.[1162] This was a landmark treaty that not only successfully eliminated 2,692 ground-launched ballistic and cruise missiles but also banned the US and Russia from deploying them.[1163] The US, for many years, alleged Russia of violation of the treaty by developing and testing missile system prohibited under the treaty. The first such violation appeared in 2014 when Russia developed an intermediate-range ground-launched cruise missile, the 9M729.[1164] However, after almost six years since Russia started violating the treaty, the US withdrawal showed that Russia was not the only cause of concern.[1165] To some, including President Trump, the treaty placed the US in a disadvantageous position, especially vis-à-vis China, as the latter was not a party to the treaty and had developed and deployed thousands of missiles prohibited by the INF treaty, threatening the US and allies in Asia.[1166] Approximately 85 percent of China's missile force, developed and deployed since 1990, are INF Treaty-class systems – if China was party to the Treaty, it would be prevented from deploying them.[1167] According to some estimates, China's 1,250 missiles are below the threshold range of 5,500km identified by INF.[1168] The deployment of SRBMs, MRBMs, IRBMs, GLCMs, and HGV would augment China's military power to prevail in a regional contingency involving Taiwan and the US. The decades of investments in developing these systems have also enabled China to only recently succeed in developing more advanced and sophisticated ICBMs, such as the DF-41, and SLBMs, such as the JL-3.[1169] The US, bound to the INF,

[1161] Ibid
[1162] Shannon Bugos, "U.S. Completes INF Treaty Withdrawal," *Arms Control Association*, September 2019, accessed September 10, 2020, https://www.armscontrol.org/act/2019-09/news/us-completes-inf-treaty-withdrawal
[1163] Ibid
[1164] Ibid
[1165] "U.S. Withdrawal from the INF Treaty: What's Next?" *CRS, In focus*, Updated January 2, 2020, accessed May 28, 2021, https://fas.org/sgp/crs/nuke/IF11051.pdf
[1166] Bugos, "U.S. Completes INF Treaty Withdrawal"; Ibid
[1167] Bates Gill, *Exploring post-INF arms control in the Asia-Pacific: China's role in the challenges ahead* (The International Institute for Strategic Studies, June 2021), 3-4
[1168] Office of the Secretary of Defense, Annual Report to Congress, 55-59, 86; Douglas Barrie, Michael Elleman and Meia Nouwens, 'The End of the Intermediate-Range Nuclear Forces Treaty: Implications for Asia," *Asia-Pacific Regional Security Assessment 2020* (London: International Institute for Strategic Studies, 2020)
[1169] Michael Chase, et al., *China's Incomplete Military Transformation: Assessing the Weaknesses of the People's Liberation Army* (PLA) (Santa Monica, CA: RAND, 2015)

had been unable to deploy its own ground-launched ballistic and cruise missiles throughout the Indo-Pacific to counter the Chinese buildup.

The 2018 NPR commits the US to nuclear arms control agreements, but this appeared insincere given many of them were at risk owing to the Trump administration's assertive approach to aspects of the global arms control regime and intention to counter China's rise in this area. The 2018 NPR notes, "ensuring our nuclear deterrent remains strong will provide the best opportunity for convincing other nuclear powers to engage in meaningful arms control initiatives."[1170] A few months after the release of the NPR, President Trump in August 2018, stated he planned to terminate the INF treaty.[1171] Later on May 21, 2020, the US envoy stated that the US is ready to leave Russia and China behind to win a new nuclear arms race if Russia and China did not concede to Trump's terms for a new deal.[1172] Moreover, according to *the Washington Post*, on May 22, 2020, some senior officials of the Trump administration discussed the option of conducting a nuclear test to pressure Russia and China to accept US terms for renewing the New START treaty.[1173] Resuming nuclear testing would be significant because it would violate the CTBT, which the US had not ratified, but had abided by in its actions. Additionally, in May 2020, Secretary of State Mike Pompeo stated that the US intended to withdraw unilaterally from the 1992 Open Skies Treaty. The treaty entered into force on January 1, 2002, helping as many as 34 member states preserve peace by allowing them to carry out unarmed observatory flights over each other's territory.[1174] The US withdrew from the treaty in November 2020, Russia followed suit and withdrew in December 2021.[1175]

Despite such an approach to nuclear arms control, the 2018 NPR notes that changes in the NPR are not "intended to enable, nor does it enable, 'nuclear war-fighting'."[1176] However, according to David Lonsdale, it is hard to believe this because one of the

[1170] The 2018 NPR, iii
[1171] Bugos, "U.S. Completes INF Treaty Withdrawal"
[1172] Video Event, "Special Presidential Envoy Marshall Billingslea on the Future of Nuclear Arms Control," *Hudson Institute*, May 21, 2020, accessed June 13, 2020, https://www.hudson.org/events/1818-video-event-special-presidential-envoy-marshall-billingslea-on-the-future-of-nuclear-arms-control52020
[1173] John Hudson and Paul Sonne, "Trump administration discussed conducting first U.S. nuclear test in decades," May 23, 2020, accessed June 11, 2020, https://www.washingtonpost.com/national-security/trump-administration-discussed-conducting-first-us-nuclear-test-in-decades/2020/05/22/a805c904-9c5b-11ea-b60c-3be060a4f8e1_story.html
[1174] Daryl G. Kimball, "Nuclear Arms Control, or a New Arms Race? Trump Seems Bent on the Latter.," May 27, 2020, accessed June 20, 2020, https://www.justsecurity.org/70407/nuclear-arms-control-or-a-new-arms-race-trump-seems-bent-on-the-latter/
[1175] Daryl Kimball, "The Open Skies Treaty at a Glance," *Arms Control Association*, December 2021, accessed January 19, 2022, https://www.armscontrol.org/factsheets/openskies
[1176] Office of the Secretary of Defense, *2018 Nuclear Posture Review*, xii

principal architects of the 2018 NPR is Keith Payne, the co-author of the seminal 1980 article on the theory of nuclear warfighting "*Victory is Possible*," discussed in the subsequent section.[1177]

The 2018 NPR, therefore, appears to be paradoxical, simultaneously talking about the development of the capabilities required for a nuclear warfighting posture, yet, as a declaratory policy, ruling out nuclear warfighting as a nuclear strategy.[1178] Scholars such as Michael Quinlan and Paul Nitze have identified this contradiction as reflecting the difference between declaratory policy – comprised of the formal statements "aimed at political and psychological effect"[1179] and the real or operational policy – the actual war policy, highlighting guidelines that should and will govern actions, such as how nuclear weapons would be used in conflict. The real war plans and capabilities may enable an operational warfighting capability even as the declarations suggest warfighting is not an option entertained by decision-makers.[1180] To comprehend this contradiction, it is imperative to explore the 2018 NPR through a nuclear warfighting lens to determine whether the NPR supports a nuclear warfighting capability. Doing this will enhance our understanding of the US approach to nuclear warfighting when China's own nuclear warfighting doctrine appears to be emerging, and the relationship between the two. The next section critically examines the 2018 NPR from the nuclear warfighting framework outlined in the previous chapter. To recapitulate, enhancing deterrence credibility, dealing

[1177] Colin S. Gray and Keith Payne, "Victory Is Possible," *Foreign Policy*, No. 39, Summer 1980, 14-27; also see Keith Payne, "Nuclear Weapons: Ours and Theirs," *National Institute For Public Policy*, May 7, 1999, accessed June 20, 2020, https://www.nipp.org/wp-content/uploads/2014/11/ours-and-theirs.pdf; Keith B. Payne et al., "A New Nuclear Review for a New Age," *National Institute for Public Policy*, April 2017, accessed June 19, 2020, www.nipp.org/wp-content/uploads/2017/06/A-New-Nuclear-Review-final.pdf; Mark Perry, "Trump's Nuke Plan Raising Alarms Among Military Brass," *The American Conservative*, February 2, 2018, accessed June 21, 2020, www.theamericanconservative.com/articles/trumps-new-nuke-nuclear-plan-npr-raisingalarms-among-military-brass-war/; David J. Lonsdale, "The 2018 Nuclear Posture Review: A return to nuclear warfighting?" *Comparative Strategy*, Vol. 38, No. 2, (20019) 98-117

[1178] Ibid

[1179] Peter Rudolf, "US Nuclear Deterrence Policy and Its Problems," *German Institute for International and Security Affairs*, November 6, 2018, accessed January 20, 2022, https://www.swp-berlin.org/en/publication/us-nuclear-deterrence-policy-and-its-problems; Paul H. Nitze, "Atoms, Strategy and Policy," *Foreign Affairs*, Vol. 34, No. 2 (January 1956) 187-98, distinguishes between declaratory policy and real or action policy, also known as employment policy. Also see Snyder, *Deterrence and Defense*, 240-241, 246; Michael Quinlan, "The Ethics of Nuclear Deterrence: A Critical Comment on the Pastoral Letter of the U.S. Catholic Bishops," *Theological Studies*, Vol. 48 (1987), 3-24.

[1180] Jeffrey Lewis, "Declaratory Policy," *Arms Control Wonk*, January 4, 2010, accessed may 29, 2021, https://www.armscontrolwonk.com/archive/202583/declaratory-policy/; Paul H. Nitze, "Atoms, Strategy and Policy," *Foreign Affairs*, January 1956, accessed May 29, 2021, https://www.foreignaffairs.com/articles/1956-01-01/atoms-strategy-and-policy

with the failure of deterrence, damage limitation, a theory of victory, and adhering to just-war tradition are factors identified by scholars to examine nuclear warfighting.[1181]

6.3 US Nuclear Posture: A Critical Appraisal

The 2018 NPR begins by highlighting the changing strategic threat environment. It then recognizes the US requirement for nuclear weapons and their changing role; dwells on the need for tailored deterrence strategies and flexible responses, and discusses challenges related to nuclear deterrence and relations with states such as Russia, China, North Korea, and Iran. The NPR also outlines the current state of US nuclear capabilities and the need for rapid nuclear force modernization. Clearly, state-centric threats are prioritized as it is only towards its end that of the document details the need to counter nuclear terrorism, discusses US commitment to nuclear non-proliferation, and outlines support for arms control.

6.3.1 Changing Strategic Threat Environment

The 2018 NPR notes that since the 2010 NPR was released, the strategic environment has changed, and this justifies significant efforts towards a more robust approach to nuclear weapons policy.[1182] It notes that the world is witnessing "the return of great power competition" and links this to Russian and Chinese nuclear force modernization.[1183] Russian and Chinese nuclear force modernization efforts are described as considerable. Russian efforts include developing the most powerful nuclear weapon, the "heavy" Sarmat (RS-28) designed to overcome missile defense with expected for deployment in 2022.[1184]

Further, it mentions Russia's PAK-DA new-generation Stealth Bomber; an autonomous nuclear powered underwater vehicle known as Status-6 expected to be deployed towards the end of the 2020s; Avangard hypersonic glide vehicle (HGV), entered in service in

[1181] Lonsdale, "The 2018 Nuclear Posture Review: A return to nuclear warfighting, 101"; also see Gray, "Nuclear Strategy: The Case for a Theory of Victory," 54-87; Gray and Payne, "Victory is Possible," 14-27; Gray, "War-Fighting for Deterrence," 5-28

[1182] To observe the change and comparatively analyse, please see Office of the Secretary of Defense, 2018 *Nuclear Posture Review*; Office of the Secretary of Defense, 2010 *Nuclear Posture Review*

[1183] Office of the Secretary of Defense, 2018 Nuclear Posture Review, 6

[1184] "Russia's first Sarmat ICBM to enter combat duty in 2022, *TASS Russian News Agency*; Michael Peck, "Russia's RS-28 Sarmat Nuclear Missile Could Destroy France in 1 Shot," *National Interest*, March 27, 2021, accessed September 1, 2021, https://nationalinterest.org/blog/reboot/russia%E2%80%99s-rs-28-sarmat-nuclear-missile-could-destroy-france-1-shot-181335

2019, and the Burevestnik nuclear-powered cruise missile (NATO dubbed as the SSC-X-9 Skyfall), is in the developmental phase.[1185]

Chinese efforts include the deployment of mobile and silo-based ICBMs capable of MIRVing, SSBNs with SLBMs, strategic bombers, and air and sea-launched cruise missiles. The latter was discussed in detail in the previous chapter. These renewed efforts by great powers to modernize their nuclear forces are striking. As almost two decades previously, there was an intense discussion about the unipolar world order led by the US as a sole superpower which, in theory, could have dissuaded other states from seeking to militarily challenge it (indeed, dissuasion was a major concept of the 2002 US National Security Strategy and justified the Bush administrations increase in military expenditure).[1186] There were also fantasies from some commentators in the US that the 'balance of power' dynamics in the international system were no longer operable; US power was such that successful challenges were unlikely.[1187]

However, today, many scholars say that the world is moving towards a form of multi-polarity and Russian and Chinese military capabilities clearly threaten America's global primacy, especially in East Europe and the Western Pacific.[1188] The NPR views the changing strategic threat environment from geopolitical and technological angles and concludes that this requires hedging against the uncertain future by creating "a more cooperative and benign security environment, but must also hedge against prospective and unanticipated risks."[1189] The NPR asserts that the level of geopolitical competition is changing due to the rapid and significant changes in power dynamics in the international system and current/emerging technological developments. All of this could have far-

[1185] "Russia's Nuclear Weapons: Doctrine, Forces, and Modernization," *Congressional Research Service* R45861, Updated January 2, 2020, accessed July 1, 2020, https://fas.org/sgp/crs/nuke/R45861.pdf; "First serial-produced Sarmat ICBMs to assume combat duty in Russia in 2021" *TASS*, February 3, 2020, accessed September 10, 2020, https://tass.com/defense/1115697; "Over 30 Years, Avangard ICBMs to assume combat duty in Russia next year," *TASS*, December 18, 2018, accessed September 10, 2020, http://tass.com/defense/1036642

[1186] The National Security Strategy of the United States of America, September 2002, accessed January 20, 2022, https://2009-2017.state.gov/documents/organization/63562.pdf

[1187] Stephen G. Brooks and William C. Wohlforth, *World Out of Balance: International Relations and the Challenge of American Primacy* (Princeton, NJ.: Princeton University Press, 2008), 1-22

[1188] Charles Krauthammer, "The Unipolar Moment," *Foreign Affairs*, 1990/91; Charles Krauthammer, "The Unipolar Moment Revisited," *The National Interest 2002-2003*, 5-17; Irshad Ali Sodhar, World Order: Unipolar to Multipolar, *MIT Press Journals*, accessed September 1, 2020, http://theallpapers.com/papers/CSS/English/Complete%20Topic%20Bas e%20Essays/Essay---World%20Order%20Unipolar%20to%20Multipolar.pdf; Christopher Layne, "The Unipolar Illusion Revisited: The Coming End of the United States' Unipolar Moment," *International Security*, Vol. 31, No. 2, (2006) 7-41

[1189] The 2018 NPR, ix

reaching implications for the US as it could increase the vulnerability of the US nuclear forces.[1190]

Thus, the emerging strategic threat environment is influencing changes in the US nuclear weapons policy. The 2010 NPR, compared to the 2018 NPR, appeared sanguine, and to some, it was based on neglecting to view the strategic environment through a realist lens.[1191] Instead of adversaries reading the 2010 NPR as a positive sign of reassurance from the US, they arguably sought to exploit an opening by pursuing ambitious nuclear policies. In turn, this undermined what appears to be long-standing efforts by previous US administrations to maintain nuclear primacy.[1192] The 2018 NPR paints a more realistic and grim picture of the international strategic environment that, according to many theorists, requires a flexible, tailored nuclear strategy based on modern and diverse force capabilities.[1193]

6.3.2 **US National Security Strategy**

As noted in the 2010 NPR, US nuclear weapons' sole intention and objective were to deter an adversary from using chemical, biological, nuclear and conventional weapons against the US and its allies. Some viewed it as less a part of the US nuclear strategy and more "an attempt to entice proliferating actors back into the non-proliferation regime."[1194] However, the 2018 NPR declares that "deterring nuclear attack is not the sole purpose of nuclear weapons."[1195] Other functions mentioned in the 2018 NPR are deterring non-nuclear strategic attacks against the US and allies and hedging against an uncertain future.[1196] Additional objectives that sound as if they are part of a warfighting strategy include "the goal of re-establishing deterrence" (in the event of war), "limiting damage

[1190] Office of the Secretary of Defense, 2018 "Nuclear Posture Review," 13
[1191] Payne, "Nuclear Deterrence," 5; Gray, "Strategic Sense," 3; Lieber and Press, *Coercive Nuclear Campaigns in the 21st Century*, 6; Lieber and Press, "The New Era of Counterforce," 9-49
[1192] Lonsdale, "The 2018 Nuclear Posture," 106
[1193] Payne, "Nuclear Deterrence," 5; Colin Gray, Strategic Sense and Nuclear Weapons Today, Information Series, *National Institute for Public Policy*, December 2017, accessed June 28, 2020, www.nipp.org/2017/12/11/gray-colin-s-strategic-sense-and-nuclearweapons-today/; Keir A. Lieber and Daryl G. Press, *Coercive Nuclear Campaigns in the 21st Century: Understanding Adversary Incentives and Options for Nuclear Escalation* (Monterey: Naval Postgraduate School: Center on Contemporary Conflict, 2013), 6; Lieber and Press, "The New Era of Counterforce: Technological Change and the Future of Nuclear Deterrence," *International Security*, Vol. 41, No. 4, (2017) 9-49
[1194] David Lonsdale, "Obama's Second Term: Time for a New Discourse on Nuclear Strategy," *Comparative Strategy*, Vol. 32, No. 5, (2013) 460
[1195] "The 2018 Nuclear Posture Review," 20
[1196] Ibid

to the extent feasible" and ensuring "robust adaptive planning to defeat and defend against attacks."[1197]

There are concerns that the new objectives in the 2018 NPR linked to nuclear weapons will have a negative impact on crisis stability.[1198] However, these concerns do not have a sound logical foundation. Firstly, scholars such as Thomas Schelling and Robert Jervis wrote that crisis stability was paramount and had to be prioritized during the Cold War.[1199] It is generally assumed that crisis stability helps in maintaining deterrence. Although this logic is from the early Cold War era, the character of nuclear weapons has not changed, which makes the logic still relevant to nuclear politics today. Therefore, anything that affects crisis stability is destabilizing and should not be pursued. In other words, the balance and counterbalance (China's modernization and the US counter-modernization), is arguably stabilizing. This may sound counterintuitive but consider the alternative – one of these sides modernizing while the other does not; the one with a superior capability could, possibly, seek to use its advantage vis-à-vis the other, leading to a crisis; the one with a relatively diminishing capability could feel pressure to pre-empt the emerging advance by the other, also leading to a crisis.

Secondly, if the US is lowering the nuclear threshold (by introducing low-yield SLBM and SLCM missiles and employing nuclear weapons against non-nuclear strategic threats, such as chemical, biological, cyber, and large-scale conventional aggression[1200]) it could be counterproductive for crisis stability and increase the chances of an accidental, unauthorized, or inadvertent use of nuclear weapons. This is because a lowered threshold could signal the adversary that if it crosses a specific line (the lowered threshold), war could be the outcome, which, in turn, might strengthen deterrence and thus crisis stability.

[1197] Ibid., 23

[1198] Steven E. Miller, "Nuclear Battleground: Debating the US 2018 Nuclear Posture Review, Policy Brief No. 63," *Asia Pacific Leadership Network for Nuclear Non-Proliferation and Disarmament/Today Peace Institute*, June 2018, www.belfercenter.org/publication/nuclear-battleground-debating-us-2018-nuclear-posture-review, 9-11; Fred Kaplan, "Nuclear Posturing: Trump's Official Nuclear Policy isn't that Different from His Predecessors: That's What Makes It so Scary," *Slate*, January 22, 2018, accessed June 26, 2020, https://slate.com/news-and-politics/2018/01/trumps-official-nuclear-policy-reaffirms-the-terrifying-status-quo.html; Austin Long, "Nuclear Strategy in an Era of Great Power Competition," and James B. Steinberg, "Expanding the Options and Lowering the Threshold for Nuclear Weapons," Policy Roundtable: The Trump Administration's Nuclear Posture Review, *Texas National Security Review*, 13 February 2018, June 13, 2020, https://tnsr.org/roundtable/policy-roundtable-trump-administrations-nuclear-posture-review/#_ftn108

[1199] Robert Jervis, "Arms Control, Stability and Causes of War," *Political Science Quarterly*, Vol. 108, No. 2, (1993) 239-253; Thomas Schelling and Morton Halperin, *Strategy and Arms Control* (New York: Twentieth Century Fund, 1961); Colin S. Gray, "Strategic Stability Reconsidered," *Daedalus*, Vol. 109, No. 4, (1980) 135-154

[1200] The 2018 NPR, 38

For instance, John Kennedy's flexible response strategy, which called for deterrence at the strategic, tactical, and conventional levels was believed to have improved deterrent efficacy, which is why it remained intact from 1961 until the end of the Cold War.[1201]

The 2018 NPR takes a multidimensional approach to nuclear deterrence. Prioritizing deterrence vis-a-vis other nuclear-armed adversaries, the NPR adopts a countervailing strategy that asserts that US nuclear weapons could be used to control escalation and to fight and win a war.[1202] The NPR also seeks to "integrate nuclear and non-nuclear military operations" for flexible deterrence and to ensure a portion of US nuclear forces are on all-day alert, capable of being used swiftly at any time.[1203] Furthermore, what is more intriguing is that the NPR refers to a strategy that mentions how the US will achieve its objectives in a post-deterrence situation. The NPR notes,

> For deterrence to be credible, the United States must prepare to respond effectively if deterrence were to fail, in ways that will achieve U.S. objectives while protecting U.S., allied, and partner interests. Non-nuclear capabilities can complement but not replace U.S. nuclear capabilities for this purpose. […] If deterrence fails… The United States will strive to end any conflict and restore deterrence at the lowest level of damage possible for the United States, allies, and partners, and minimize civilian damage to the extent possible consistent with achieving objectives.[1204]

Together, this approach will enhance the credibility of US nuclear deterrence in Washington's calculus. It is pertinent here to inquire what *objectives* the US would try to pursue during a nuclear war. According to the text above, the primary objective the US would pursue is damage limitation and the restoration of deterrence by ending the war as quickly as possible. This coincides with the NPR stating, "…the initiation and conduct of nuclear operations would adhere to the law of armed conflict…."[1205] As per the law of armed conflict, the NPR attaches defensive purpose to nuclear weapons, rules out counter-value objectives, and leaves counter-force targets as the only choice. The US DoD released a document *Joint Nuclear Operation* on April 17, 2020, which notes, "the law of armed conflict governs the use of nuclear weapons. For example, nuclear weapons

[1201] John S. Duffield, "The Evolution of NATO's Strategy of Flexible Response: A Reinterpretation," *Security Studies*, Vol. 1, No. 1, (1991), 132-156
[1202] "Nuclear Posture Review," 21
[1203] Ibid, 22, 58
[1204] Ibid, 23
[1205] Ibid

must be directed against military objectives."[1206] Nuclear attacks "must not be conducted when the expected incidental harm to civilians is excessive compared with the military objective sought."[1207] The document further notes that the "CCDRs [combat commanders] and other subordinate commanders responsible for the conduct of nuclear operations, must ensure their staff judge advocate is involved in nuclear operations planning and targeting processes."[1208]

In theory, counter-force targeting such as the adversary's nuclear forces, NC3 systems in conjunction with the BMD system would enable the US to limit damage for itself and its allies.[1209] Counter-force objectives are reminiscent of the latter part of the Cold War and the warfighting doctrine that emerged, especially during the Reagan administration through the National Security Decision Directive 13 (NSDD).[1210] During this time, US weapons systems had, some argued, sufficient accuracy and capability to fight a nuclear war.[1211] In 2017, Lieber and Press also argued that the computer and nuclear revolution led to the development of technologies related to the survivability of nuclear weapons, emerging counterforce technologies such as improving missile accuracies, low-causality counterforce technologies, remote sensing and its impact on mobility concealment of land and sea-based nuclear delivery platforms and a fading fratricide problem (the accidental or unintended destruction of nuclear weapons or delivery systems because of the detonations of other warheads in the same attack), had further enhanced the viability of counter-force options for the US.[1212] Moreover, though not explicitly mentioned, it is logically assumed that restoration of deterrence could be achieved through intra-war deterrence by denial and punishment. Deterrence by denial would be based on counter-escalation or escalation-dominance strategies, and punishment would be based on unacceptable damage referred to as "unacceptable consequences" in the NPR.[1213]

[1206] Joint publication 3-72, Joint Nuclear Operations, April 17, 2020, accessed January 21, 2022, https://irp.fas.org/doddir/dod/jp3_72_2020.pdf
[1207] Ibid
[1208] Ibid
[1209] Payne, "Nuclear Deterrence in a New Age," 6-7
[1210] National Security Decision Directive 13, "Nuclear Weapons Employment Policy," October 13, 1981, Top Secret, *National Security Archives*, accessed September 2, 2021, https://nsarchive.gwu.edu/document/20309-national-security-archive-doc-24-national
[1211] Payne, "Nuclear Deterrence in a New Age," 6-7
[1212] Lieber and Press, "The New Era of Counterforce"
[1213] The 2018 Nuclear Posture Review, VII

According to Lonsdale, three possible scenarios could involve counter-force nuclear use.[1214] Firstly, the nuclear forces might have higher strategic value for an adversary than their conventional forces, and losing them would thus be viewed as 'unacceptable damage' on their own. Secondly, policymakers in the US may understand that even a limited counter-force strike would inevitably bring collateral (counter-value) damage, yet, the desire for low-yield precision weapons mentioned in the NPR may limit collateral damage. Furthermore, low-yield weapons would ideally serve the purpose of counter-force operations and limit damage. The US will still have strategic nuclear warheads at its disposal, should it required. Lastly, although not mentioned explicitly in the NPR, Lonsdale suggests that "perhaps there is a return to the notion of attacking targets associated with political control," and when coupled with low-yield targets, they would reduce the chances of collateral damage in such a campaign. [1215]

The NPR outlines damage limitation and re-establishment of deterrence as objectives in (fighting) a nuclear war.[1216] However, these objectives are envisaged as being achieved as part of the initial phase of a nuclear war. The achievement of the objectives in the post-deterrence scenario would necessarily require the US to have a theory of victory (winning a nuclear war), which is missing in the NPR. It is possible that the theory of victory was deliberately not included in the NPR, as it may appear too provocative and compel states like Russia and China to accelerate their nuclear weapon programs and modernization dramatically. A return to a new full-scale nuclear arms race would be costly and destabilizing for all involved; although we should not forget Trump's tweet that, at least while he was president, he was willing to engage and 'win' an arms race if he had to.[1217] It is not impossible for future US presidents (including Trump were he to run and win in 2024) would embrace this point of view.

Damage limitation and the re-establishment of deterrence are reasonable objectives to be achieved in a nuclear war: however, Lonsdale contends that these limited objectives provide a state with a limited desire to use nuclear weapons in a conflict, contrary to a full-scale war where objectives are neither damage limitation nor re-establishment of

[1214] Lonsdale, The 2018 Nuclear Posture, 108
[1215] Ibid
[1216] The 2018 NPR, 23
[1217] Ed Pilkington and Martin Pengelly, "'Let it be an arms race': Donald Trump appears to double down on nuclear expansion," *The Guardian*, December 24, 2016, accessed January 22, 2022, https://www.theguardian.com/us-news/2016/dec/23/donald-trump-nuclear-weapons-arms-race

deterrence.[1218] According to the NPR, the US would be likely to use nuclear weapons if an adversary launched a nuclear or WMD or significant non-strategic attack on the US or its allies.[1219] This could come into play in a wide array of scenarios. For example, it could be a Russian invasion of the Baltic States or a Chinese invasion of Taiwan, a maritime dispute involving China and the US, or between China and the US regional allies like Japan and South Korea. Alternatively, it could be a situation wherein an adversary uses weapons of mass destruction or launches a cyberattack on critical US infrastructure, generating damage sufficient to be considered akin to the use of a WMD. Thus, there is some ambiguity inherent in the US messaging as to when it would or would not respond with nuclear weapons to attacks on itself or its allies. Such scenarios would require policymakers in the US to consider a range of objectives. As Lieber and Press write, "In some cases, wars may be triggered by events that compel U.S. leaders to pursue decisive victory, conquest, and/or regime change – even if the enemy has nuclear weapons."[1220] Thus, in some cases, damage limitation or restoration of deterrence would not be enough, and pursuing destruction or the complete submission of an adversary would be preferred. Therefore, what Lieber and Press note would require a theory of victory based on the understanding of the use of nuclear weapons for limited and decisive military victory.[1221] A capable and credible nuclear warfighting capability fits these purposes.

Nevertheless, the 2018 NPR, in rhetoric, rules out nuclear warfighting, which is a substantial disconnect in the US nuclear strategy and creates a puzzle for strategists. The NPR notes, "the United States will enhance the flexibility and range of its tailored deterrence options. To be clear, this is not intended to, nor does it enable, 'nuclear war-fighting'."[1222] It raises the possibility that nuclear warfighting may be the real strategy, and the NPR's declaratory statements may be an exercise in public relations and intended to ensure there is ambiguity as to how the US intends to use its forces. Furthermore, the 2018 NPR explains that the US seeks to acquire a wide range of modern nuclear forces – forces suited for nuclear warfighting – all the while ruling out such intentions. Both the US and China may be engaged in a game of claiming their policies are not linked to capabilities to fight and win nuclear wars, all the while pursuing capabilities to allow them to do so if necessary, and to hedge against an increased decline in relations or should

[1218] Lonsdale, The 2018 Nuclear Posture, 108
[1219] The 2018 NPR, 21
[1220] Lieber and Press, *Coercive Nuclear Campaigns*, 46
[1221] Ibid
[1222] The 2018 Nuclear Posture, XII

they feel it imperative to rapidly expand their nuclear forces. The next section focuses on the ongoing nuclear weapons force modernization of the US, followed by the implications for the US-China deterrence stability.

6.3.3 **Modernization of US Nuclear Forces during the Trump Administration**

The Trump administration 2018 NPR highlights the critical attributes required of US nuclear forces. This includes enhanced survivability, greater mobility and longer ranges for forward deployments, more advanced and efficient NC3, greater diversity in the inventory of missiles with different ranges and trajectories, reallocation capacity and accuracy, and defense penetrating capability for tailored responses, and lastly, the capacity to display will and capability.[1223] When combined with effective NC3, these attributes of the nuclear forces will provide flexible and graduated response capabilities, which are critical for the following four functions:

> [To] Provide survivable, responsive capabilities to ensure adversaries do not attempt a disarming first strike. Demonstrate resolve through the positioning of forces, messaging, and flexible response options. Ensure the U.S. can respond to a broad range of contingencies with tailored options. Mitigate the risk of technological failure or adversary breakthrough while providing adaptability to changes in the security environment.[1224]

The NC3 itself is a domain separate from the nuclear triad. Jeffrey Larsen views NC3 as a "fifth pillar" of the US nuclear deterrence (comprised of three legs of the triad and a fourth of nuclear weapons).[1225] According to one CRS report, the NC3:

> Collects information on threats to the United States, communicates that information through the chain of command to the President, advises the President on options for a response, communicates the President's chosen response to the forces in the field, and controls the targeting and application of those forces.[1226]

To achieve these objectives, the NC3 performs numerous critical functions such as situation monitoring, nuclear war planning, decision-making, force management, and force direction.[1227] The US NC3 system includes:

> Warning systems include fixed, terrestrial phased array warning radars; the Defense Support Program (DSP) system and its replacement, the Space

[1223] Office of the Secretary of Defense, 2018 Nuclear Posture Review, 44
[1224] Ibid
[1225] Jeffrey Larsen, "Nuclear Command, Control, And Communications: US Country Profile," NAPSNet Special Reports, August 22, 2019, accessed July 11, 2020, https://nautilus.org/napsnet/napsnet-special-reports/nuclear-command-control-and-communications-us-country-profile/
[1226] Amy Woolf, "Defense Primer: Command and Control of Nuclear Forces," *In Focus*, Congressional Research Service, updated January 10, 2020, 1
[1227] Larsen, Nuclear Command, Control and Communications

> Based Infrared System (SBIRS); and the U.S. Nuclear Detonation Detection System (USNDS). Communications systems include the Military Strategic and Tactical Relay (MILSTAR) satellites and its replacement, the Advanced Extremely High Frequency (AEHF) satellites; a wide variety of ground-based transmission systems across the radio frequency spectrum; and Take Charge and Move Out (TACAMO) relay aircraft. The fixed command posts include the National Military Command Center (NMCC) and the U.S. Strategic Command Global Operations Center. Fixed command posts also include linkages to U.S. forward-deployed forces in USEUCOM and elsewhere. Mobile command posts include the E4B National Airborne Operations Center (NAOC), the E6B Airborne Command Post (ABNCP), and ground mobile systems. Control centers for nuclear systems are in ICBM Launch Control Centers, on SSBNs, and aboard bomber aircraft.[1228]

Together, these systems provide the US with overlapping networks capable of quickly identifying any missile launched towards the continental US. The ground-based systems include data receiving stations linked to satellites that disseminate data to relevant decision-making centers to provide recommendations to the political leadership in case of an imminent threat or attack.[1229] If required, these systems also provide a secure channel to order strikes.[1230] The 2018 NPR enumerates a series of initiatives for NC3 modernization, which includes:

> Strengthening protections against cyber threats, strengthening protection against space-based threats, enhancing integrated tactical warning and attack assessment, improving command post and communication links, advancing decision support technology, integrating planning and operations, and reforming governance of the overall NC3 system.[1231]

The US Strategic Command (StratCom) is modernizing NC3. Its Commander Admiral Charles Richard stated in January 2021 that NC3 is "a very complex system of systems."[1232] The next-generation upgrade will be incremental, with a total of five increments. The first increment is defined and featured in DoD's program objective memorandum. It aims to improve "the military's posture in space as well as harden the NC3 system to cyber and cryptographic threats. It also 'de-legacies' much of the existing

[1228] Nuclear Posture Review, 56-57
[1229] Jeffrey Larsen, "NUCLEAR COMMAND, CONTROL, AND COMMUNICATIONS: US COUNTRY PROFILE," NAPSNet Special Reports, August 22, 2019, accessed September 12, 2020, https://nautilus.org/napsnet/napsnet-special-reports/nuclear-command-control-and-communications-us-country-profile/
[1230] Ibid
[1231] Nuclear Posture Review, xiii
[1232] Yasmin Tadjdeh, "JUST IN: Stratcom Revitalizing Nuclear Command, Control Systems," *National Defense*, January 5, 2021, accessed September 2, 2021, https://www.nationaldefensemagazine.org/articles/2021/1/5/work-underway-for-next-generation-nuclear-command-control-and-communications

system, which will allow users to 'dynamically reconfigure' the platform."[1233] The second increment is under experimentation, and details are kept classified. The current modernization of NC3 will allow US policymakers to increase flexibility for tailored deterrence strategies, and enhance BMD efficiency and early pre-emption capability against missiles launched from any platform. With these NC3 systems and other new initiatives announced in the 2018 NPR (discussed above), the US is on a trajectory towards acquiring a nuclear warfighting capability to ensure it can fight and try to control or win a nuclear war in an increasingly complex modern security environment. Irrespective of whether it can be achieved or would work in practice, that appears to be the US objective.

The NPR outlines a concrete nuclear force modernization plan. It notes that "a portion of the ICBM [Minuteman-III] force can be uploaded [with MIRV-ed warheads, increasing the number of warheads by 1-3] if there is a need to do so – a capability that contributes to our hedging capacity."[1234] By contributing to the hedging capacity, the NPR's modernization plan means the US could expand the quantity of its nuclear forces rapidly. Replacement of Minuteman III is due by 2030, and the US "will begin fielding its replacement, the Ground-Based Strategic Deterrent (GBSD), on-time in 2029."[1235] GBSD is an extensive program to modernize 450 facilities capable of launching new ICBMs that will replace the existing Minuteman III ICBMs. The US Army by 2023 and the US submarines by 2024 are expected to field what President Trump called a new 'super-duper missile,' a hypersonic missile capable of flying 17 times faster than the speed of sound.[1236]

Related to strategic bombers and air-delivered weapons, the NPR notes that the existing bomber force consists of 66 strategic bombers, of which 46 are B-52-H, and the remainder are B-2-A stealth.[1237] The B-52-H were armed with Air Launch Cruise Missiles (ALCMs), providing the US with the capability to engage targets while staying away from the adversary's defensive systems. According to the NPR, the US has launched a program to build a next-generation long-range stealth strike bomber, the B-21 Raider, which will

[1233] Ibid
[1234] The 2018 Nuclear Posture Review, 46
[1235] Ibid
[1236] Ryan Pickrell, "The Pentagon finally reveals what Trump's mysterious 'super duper missile' actually is," *Business Insider*, July 18, 2020, accessed September 3, 2021, https://www.businessinsider.com.au/pentagon-finally-reveals-what-trumps-super-duper-missile-actually-is-2020-7
[1237] Nuclear Posture Review, x

replace B-1, B-2, and possibly replace B-52-H in the future.[1238] Initially, it will have a supplementary role but will replace both conventional and nuclear-capable bombers, starting from mid-2020.[1239] Similarly, ALCMs, because of their growing vulnerability to bombers, will be replaced by Long-range Standoff (LRSO) missiles, which will increase the bomber force targeting capability. The B83-1 and B61-11 gravity bombs will also be replaced by B61-12 gravity bombs, which are critical in destroying silos and underground command bunkers. The B61-12 production was expected in late 2021.[1240] According to the US Department of Energy, "the National Nuclear Security Administration (NNSA) successfully completed the B61-12 Life Extension Program (LEP) First Production Unit (FPU) on November 23, 2021."[1241] The non-strategic force is also experiencing overhauls and new deployments. The nuclear-capable and forward deployable F-35 aircraft will replace obsolete the F-15E dual-capable aircraft (DCA) capable of carrying a B-61 gravity bomb.[1242]

Additionally, the Trump administration planned to replace 14 Ohio class SSBNs with 12 Columbia class SSBNs. The work on the design of Columbia class SSBN is well underway.[1243] Unlike the Ohio class, the Columbia class SSBNs will be equipped with a life-of-the-ship nuclear fuel core, enough for 42 years expected life of the SSBN. The Columbia class SSBNs will possess 16 tubes, four tubes fewer than the Ohio class for SLBMs; however, DoD officials are confident that the SSBN will have the capability to fully perform their deterrent role in the 2030s and beyond.[1244] Its electric-driven propulsion makes it stealthier than other SSBNs, increasing its survivability and making it suitable for surprise attacks. Additionally, the Trident D5 SLBM, undergoing up-grades under the life extension program (LEP), would be able to stay in service until 2042.[1245]

The Trump administration initiated upgrades to the entire nuclear triad. The air leg of the triad is being upgraded with the induction of strategic bombers coupled with LRSOs. One

[1238] "Air Force B-21 Raider Long-Range Strike Bomber," *CRS*, Updated July 7, 2021, accessed September 7, 2021, https://sgp.fas.org/crs/weapons/R44463.pdf
[1239] Ibid, 47
[1240] Kristensen and Korda, "Nuclear Notebook: United States nuclear weapons," 2021
[1241] "NNSA Completes First Production Unit of B61-12 Life Extension Program," *National Nuclear Security Administration*, December 2, 2021, accessed February 21, 2022, https://www.energy.gov/nnsa/articles/nnsa-completes-first-production-unit-b61-12-life-extension-program
[1242] "Air Force B-21 Raider Long-Range Strike Bomber," *CRS*, 48
[1243] Kristensen and Korda, "Nuclear Notebook: United States nuclear weapons," 2021
[1244] Ibid
[1245] Ibid

objective is to upgrade the air leg with the non-strategic nuclear-capable F-35, which will give it a new tactical nuclear role in a regional conflict vis-à-vis China.[1246] At present, it is unknown what kind of "nuclear capability" the F-35 will carry. The Trump administration may augment the F-35 to carry LRSOs capable of carrying the low-yield gravity bomb B-61-12. As the NPR notes, the administration is "expanding flexible U.S. nuclear options now, to include low-yield options," and mentions that it "is important for the preservation of credible deterrence against regional aggression."[1247] Moreover, the NPR also mentions that "in the near-term, the United States will modify a small number of existing SLBM warheads to provide a low-yield option, and in the longer term, pursue a modern nuclear-armed sea-launched cruise missile (SLCM)."[1248] This also coincides with the US strategic goal of eroding China's growing hard power in the near seas, primarily in the South China Sea. The LRSO cruise missiles, ALCMs, and SLCMs with low-yield capability will augment the US long-range capabilities to target Chinese military formations and installations in the South China Sea and on the borders from a safe distance, potentially with impunity.[1249]

Low-yield SLBMs, according to some analysts, could have unpredictable implications for crisis stability and escalation. Vipin Narang explains that it would be difficult to differentiate between a low-yield strike designed to eliminate limited targets, such as large military bases, underground military facilities, or large industrial complexes, and a strategic strike that seeks to fight a nuclear war, intended for both counter-value and counter-force targets. A low-yield strike could be mistaken for a strategic strike by early-warning systems or after a conflict had already started amidst tit-for-tat of warfare.[1250] The increased mobility provided by advanced platforms such as SSBNs would also help low-yield nuclear weapons to evade an adversary's missile defense systems.[1251] To some analysts, the low-yield capability will also provide the US with increased flexibility to fight a limited nuclear war, and could increase the incentives to launch a strike if US

[1246] The 2018 NPR, 50
[1247] Nuclear Posture Review, xii
[1248] Ibid
[1249] Ibid
[1250] Vipin Narang, "The Discrimination Problem: Why Putting Low-Yield Nuclear Weapons on Submarines Is so Dangerous," Policy Roundtable: The Trump Administration's Nuclear Posture Review, *Texas National Security Review*, February 13, 2018, accessed July 15, 2020, https://tnsr.org/roundtable/policy-roundtable-trump-administrations-nuclear-posture-review/
[1251] Al Mauroni, "Maintaining the Course: For the Most Part," Policy Roundtable: The Trump Administration's Nuclear Posture Review, *Texas National Security Review*, February 13, 2018, July 15, 2020, https://tnsr.org/roundtable/policy-roundtable-trump-administrations-nuclear-posture-review/

decision-makers perceive the cost-benefit (and risk-reward) of a strike to have improved owing to new capabilities.[1252]

Having outlined the warfighting framework and salience of the 2018 NPR above, the following section critically evaluates the NPR, using the warfighting framework to do so. The purpose of this critical evaluation is to understand what the Trump administration is signaling and seeking through the changes outlined in the NPR and, therefore, in US nuclear strategy.

6.4 The 2018 NPR: A Critical Assessment

The 2018 NPR outlined the Trump administration's plans to develop low-yield nuclear weapons, new sea-launched cruise missiles, and a new nuclear weapons infrastructure.[1253] These developments require substantial financial commitments. According to one report, the US spent $35.4 billion on nuclear weapons in 2019, increasing to $5.8 billion from 2018.[1254] According to the Congressional Budget Office, the US will spend $634 billion in the next decade (2021-2030) to sustain and modernize the nuclear weapons program, "the figure is 28% higher than the previous 10-year projection released in 2019."[1255] The Biden administration is requesting $43.2 billion in 2022 for the DOD and energy department to sustain and modernize the nuclear weapons program, continuing the Trump plans.[1256] This includes approximately $5 billion for 12 Columbia-class SSBNs, $2.8 billion to carry on the development of the B-21 Raider strategic bomber, $609 million for the LRSO program, and $2.55 billion for the replacement of the Minuteman III ICBMs with the Ground-Based Strategic Deterrent (GBSD) system.[1257]

The Trump administration believed that nuclear weapons and force modernization would help the US "ensure that potential adversaries perceive no possible advantage in limited

[1252] Lonsdale, The 2018 Nuclear Posture, 110
[1253] Ibid.,4; The 2018 Nuclear Posture, xiv-xv
[1254] Allen Kim, "The US accounted for nearly half of the $72.9 billion spent on nuclear weapons last year," *CNN*, May 14, 2020, accessed September 15, 2020, https://edition.cnn.com/2020/05/14/us/nuclear-weapons-spending-trnd/index.html
[1255] Kingston Reif, "Biden Continues Trump Nuclear Funding," *Arms Control Association*, July-August 2021, accessed September 7, 2021, https://nz.mail.yahoo.com/d/folders/1/messages/APLzwx4pFGjoYTWuLQ5byEHXfuQ; Kingston Reif and Shannon Bugos, "Projected Cost of U.S. Nuclear Arsenal Rises," *Arms Control Association*, June 2021, accessed September 7, 2021, https://www.armscontrol.org/act/2021-06/news/projected-cost-us-nuclear-arsenal-rises
[1256] Ibid
[1257] Ibid

nuclear escalation, making nuclear employment less likely."[1258] In other words, any nuclear employment will be met with a response presumably greater than the adversary's initial action.

The NPR also notes, "expanding flexible U.S. nuclear options…is important for the preservation of credible deterrence against regional aggression" from states such as Russia, China, and North Korea.[1259] Such a stance seeks to assure allies by establishing/retaining the credibility of extended nuclear deterrence. The ideas discussed in the NPR related to counter escalation, flexible and graduated response, deterrence not being the sole purpose of nuclear weapons, possible resumption of nuclear weapons testing,[1260] and intentions to develop low-yield weapons demonstrate a significant change in the nuclear weapons policy of the Trump administration as compared to its predecessors.

Table 12. The 2010 and 2018 NPR - A Comparison

Items	2010 NPR (sole-deterrence strategy)	2018 NPR (warfighting strategy)
Nuclear Weapons Capabilities Development	Not develop new nuclear capabilities, use only Life Extension Programs (LEPs) Retain nuclear triad under New START)	Two new nuclear capabilities (SLCM and low-yield SLBM) Retain and Modernize nuclear triad
Negative Security Assurance	Not use or threaten to use nuclear weapons against NPT NNWS fully complying with their non-proliferation obligations	Continuous Negative Security Assurance Reject No-First- Use policy
Nuclear Weapons Use Policy	Extreme circumstances excluding chemical or biological weapons uses	Extreme circumstances, including significant non-nuclear strategic attack

Furthermore, the NPR reveals how US nuclear weapons could be used against adversary nuclear forces. The NPR notes the possibility that deterrence could fail and, "if deterrence fails, the United States will strive to end any conflict at the lowest level of damage possible and on the best achievable terms for the United States, allies, and partners."[1261]

[1258] Nuclear Posture Review, 54
[1259] Ibid., xii
[1260] "The United States will pursue initiatives to ensure the necessary capability, capacity, and responsiveness of the nuclear weapons infrastructure and the needed skills of the workforce, including the following: Maintain and enhance the computational, experimental, and testing capabilities needed to annually assess nuclear weapons." Ibid., xv
[1261] The 2018 NPR, viii

The damage-limitation approach requires both strategies and capabilities similar to warfighting. The NPR calls for "flexible and limited U.S. nuclear response options, in part to support the goal of re-establishing deterrence following its possible failure."[1262] The NPR notes that there is no certainty in the reestablishment of deterrence. However, in some cases, it might contribute to limiting the damage by calling for "robust adaptive planning to defeat and defend against attacks, including missile defense and capabilities to locate, track, and target mobile systems of regional adversaries."[1263] Damage limitation operations against a nuclear adversary would be likely to involve limited-scale nuclear strikes to re-establish deterrence as the NPR mentions that the "non-nuclear capabilities, which we are now strengthening, can complement but not replace U.S. nuclear forces for this purpose."[1264]

However, as previously noted, though the 2018 NPR rejects the idea of nuclear warfighting at the declaratory level of nuclear policy, nuclear warfighting is not at odds with the objectives of achieving damage limitation and re-establishing deterrence, mentioned in the 2018 NPR.

Historically, the US has released selected parts of its nuclear plan, known as the Single Integrated Operational Plan (SIOP).[1265] Recently, a document "Nuclear Operations" was supposedly mistakenly put on the Pentagon's website, and was removed after a week. Arms control experts explain that the document reveals contemporary US nuclear thinking favoring nuclear war-fighting.[1266]

It remains available on the *FAS* website. The document notes,

> Using nuclear weapons could create conditions for decisive results and the restoration of strategic stability. Specifically, the use of a nuclear weapon will fundamentally change the scope of a battle and create conditions that affect how commanders will prevail in conflict.[1267]

[1262] Ibid, 23
[1263] Ibid, 23
[1264] Ibid
[1265] Scott D. Sagan, "SIOP-62: The Nuclear War Plan Briefing to President Kennedy," *International Security*, Vol. 12, No. 1, (Summer, 1987), 22-51; also see Matthew G. McKinzie, Thomas B. Cochran, Robert S. Norris, and William M. Arkin, "The U.S. Nuclear War Plan: A Time For Change," *Natural Resources Defense Council*, June 2001, accessed September 15, 2020, https://www.nrdc.org/sites/default/files/us-nuclear-war-plan-report.pdf
[1266] Julian Borger, "Nuclear weapons: experts alarmed by new Pentagon 'war-fighting' doctrine," *The Guardian*, June 19, 2019, accessed September 15, 2020, https://www.theguardian.com/world/2019/jun/19/nuclear-weapons-pentagon-us-military-doctrine
[1267] Nuclear Operations, Joint Publication 3-72, Federation of American Scientists, June 11, 2019, accessed September 15, 2020, https://fas.org/irp/doddir/dod/jp3_72.pdf

The document, while addressing the emerging targets amidst war and adaptive planning, notes that throughout the operational environment,

> There may be a requirement to strike additional (follow on and/or emerging) targets in support of war-termination or other strategic objectives. Commanders must maintain the capability to rapidly identify and strike previously unidentified or newly emerging targets. This capability includes planning for, and being able to perform, time-sensitive or adaptive planning for newly identified targets by maintaining flexibility in planning for availability of weapons and delivery systems for striking these targets.[1268]

The 2018 NPR focuses on limited nuclear weapons use and objectives, which may leave the adversary in a position favorable to escalating a limited nuclear conflict. The declared goals of damage limitation and re-establishment of deterrence are two *warfighting objectives,* but alone these goals are not the sum of total objectives, (i.e., fighting and winning a nuclear war), required during a nuclear conflict. Perhaps, the Trump administration wanted to introduce gradual changes in the NPR towards warfighting, therefore, it was hedging on damage limitation and re-establishment of deterrence before by rejecting the nuclear warfighting at the declaratory level, and deliberately left other elements of warfighting, such as the theory of victory (i.e., articulation of *nuclear war-winning objectives* as discussed above), to be incorporated in the next NPR. The SIOP of the President Nixon administration (1969-1974), declassified in 2005, reveals that during the Cold War, the US had well-articulated nuclear war-winning objectives.[1269] The SIOP identified three core objectives;

> ALPHA: to destroy Soviet and Chinese strategic nuclear delivery capabilities located outside of urban areas. This task included the destruction of high-level Chinese and Soviet military and political control centers.
>
> BRAVO: to destroy non-nuclear Soviet and Chinese conventional military capability (including barracks, tactical air fields, and the like) located outside of urban areas.
>
> CHARLIE: to destroy Chinese and Soviet nuclear weapons capabilities located in urban areas, as well as 70 percent of the urban-industrial sector.[1270]

[1268] Nuclear Operations, Joint Publication, iii-3
[1269] William Burr, "To Have the Only Option that of Killing 80 Million People is the Height of Immorality" The Nixon Administration, the SIOP, and the Search for Limited Nuclear Options, 1969-1974, *National Security Archive*, Electronic Briefing Book No. 173, https://nsarchive2.gwu.edu/NSAEBB/NSAEBB173/
[1270] Ibid

The declassified document also shows that in 1971, the US had more than 18,100 warheads targeting 18,900 installations of alpha, bravo and charlie categories.[1271] Reflecting on past SIOPs, we can assume that the US must have one at present tailored according to contemporary requirements. It appears that, at least in declaratory policy, there was a deliberate attempt to eschew outlining a comprehensive nuclear warfighting strategy for a limited one in the 2018 NPR. Two possible reasons are firstly, a warfighting strategy could have a destabilizing effect on the US-led Indo-Pacific security alliance structure. China is expanding its military influence in the region, and a US warfighting strategy at the regional level could exacerbate competitive trends that are already underway, noted in the 2018 NPR. The Chinese regional expansion triggered the development of the new nuclear capabilities in the US arsenal, (i.e., SLCM and low-yield SLBM). With the expansion of US strategic capabilities and the introduction of new sub-strategic capabilities, the US risks lowering the nuclear threshold and increasing the likelihood of nuclear employment in a conflict involving China.[1272] With this in the background, even a brief articulation of nuclear war-winning objectives could have triggered a series of offensive and defensive actions from China, such as the deployment of medium and intermediate-range ballistic missiles off the Taiwanese coast, increased violation of Taiwanese air space, increased military presence and aggressive posturing in the China Sea, and probably strategic signaling by increasing the nuclear alert level or increase SSBNs bastion patrols. Even if these actions had a defensive connotation for China, they could have a significant destabilizing effect on the US alliance structure in the region, demanding more staunch security assurance from the US.

Secondly, the US strategic nuclear inventory is the largest and most advanced. It is also on a trajectory of modernizing and replacing its aging nuclear weapons and forces.[1273] However, it has recently introduced sub-strategic nuclear options that will allow a limited or regional warfighting strategy to be more fully operationalized in the future. This may also reflect that US policymakers were reluctant to employ strategic nuclear inventory in a regional or limited conflict or wanted to preserve the sub-strategic capability required to climb the springs of the escalation ladder.

[1271] Ibid

[1272] John Gower, "The Dangerous Illogic of Twenty-First-Century Deterrence through Planning for Nuclear Warfighting," *CEIP*, March 6, 2018, accessed September 25, 2021, https://carnegieendowment.org/2018/03/06/dangerous-illogic-of-twenty-first-century-deterrence-through-planning-for-nuclear-warfighting-pub-75717

[1273] "The 2018 NPR," xi

In any event, the nuclear force modernization and expansion underway in the US should, in the future, provide decision-makers with an opportunity for greater flexible employment of enhanced nuclear weapon capabilities across the spectrum of conflict. If the US threat perceptions change and the strategic threat environment deteriorates further, the 2018 NPR has provided an open trajectory by establishing a new hedging baseline for developing a comprehensive nuclear warfighting strategy if necessary. The upcoming section highlights the developments in the 2018 NPR concerning China's nuclear force modernization.

6.5 The China Threat and US Nuclear Posture

Since 2015, China has been investing in nuclear force modernization programs such as improvements in ICBMs and launchers, introducing multiple independently targetable re-entry vehicle (MIRVing) capabilities, precision hypersonic boost-glide missiles, dual-capable medium and intermediate-range missiles, and anti-satellite weapons.[1274] It is perhaps because of this ambitious nuclear force development program that the 2018 NPR places Russia and China in the same category, stating "Russia and China are pursuing asymmetric ways and means to counter US conventional capabilities, thereby increasing the risk of miscalculation and the potential for a military confrontation with the United States, its allies, and partners."[1275] The NPR also notes a lack of transparency in China's military policies and suggests the US is suspicious about Beijing's future intentions and over what its nuclear doctrine is. Before moving to the next section, it is essential to briefly show a comparison of the US and China's nuclear forces so that the existing balance of terror between the US and China may be evaluated and the trajectory of the current modernization considered.

[1274] Kristensen and Korda, "Nuclear Notebook: Chinese nuclear forces," 2021
[1275] "Nuclear Posture Review Report 2018," 11

Table 13. US vs. China: Land-based nuclear force comparison 2021

US Land-based Nuclear Forces[1276]					
Type/Designation	**No.**	**Year deployed**	**Range (KM)**	**Warheads x yield (kilotons)**	**Warheads (total available)**
LGM-30G Minuteman III	400	2015 (extended the service life to 2030)	13000	1–3 W78 x 335 MIRV (Mk-12A warhead)	600
				1 W87 x 300 (Mk-12 warhead)	200
Total					**800**
Chinese Land-based Nuclear Forces					
Type/Designation	**No of launchers**	**Year deployed**	**Range (KM)**	**Warhead x yield1 (kilotons)**	**No of warheads**
DF-4	5	1980	5,500+	1 x 3,300	6
DF-5A	10	1981	12,000	1 x 4,000-5,000	10
DF-5B	10	2015	13,000	5 x 200-300	50
DF-5C	n.a.	(2020)	13,000	MIRV	--
DF-15	?	1990	600	1 x ?	--
DF-17	(18)	(2021)	1,800+	1xHGV	--
DF-21 A/E	40	2000, 2016	2,100+	1 x 200-300	40
DF-26	100	2016	4,000	1 x 200-300	20
DF-31	6	2006	7,200	1 x 200-300	6
DF-31A	36	2007	11,200	1 x 200-300	36
DF-31AG	36	2018	11,200	1 x 200-300	36
DF-41	18	2020	12,000	3x200-300	54
Subtotal	**280**				**258**

The land-based nuclear force of the US is the secondary leg of the US nuclear triad. The Minuteman-III, after the life extension program started in 2015, is the only ICBM in the US inventory responsible for carrying out land-based nuclear operations. US silo-based ICBMs will retire in 2030, after being replaced by the next-generation ICBM, known as the Ground-Based Strategic Deterrent (GBSD).[1277] However, the land-based nuclear force of China holds the primary role in China's forces. This is visible from the number of nuclear weapons assigned to the land-based nuclear force of China, noted in the table above.

The recent surge in the construction of missile silos in China has raised alarms in the US. The US Vice Chairman of the Joint Chiefs, Gen. John E. Hyten, stated that China's

[1276] Kristensen and Korda, "Nuclear Notebook: Chinese nuclear forces," 2021; Kristensen and Korda, "Nuclear Notebook: United States Nuclear Forces 2021; Missile Defense Project, "DF-41 (Dong Feng-41 / CSS-X-20)," Missile Threat, *Center for Strategic and International Studies*, August 12, 2016, last modified October 8, 2019, accessed September 26, https://missilethreat.csis.org/missile/df-41/.
[1277] US Nuclear Forces 2020, 127

nuclear modernization is unprecedented. Hyten made this clear in relation to the US GBSD construction, saying,

> if everything goes right, we'll have 400 new silos with an initial operational capability in 2030, full operational capability [in] 2035. It's going to take us 10, 15 years to modernize 400 silos that already exist. China's building that many, basically, overnight… [The] speed of that difference … is what really concerns me the most.[1278]

Given China's NFU, "you have to ask yourself, why are they building that enormous, enormous nuclear capability, faster than anybody in the world?"[1279]

Table 14. US vs. China: Sea-based nuclear force comparison 2021

US Submarine-launched ballistic missiles[1280]					
Type/Designation	**No.**	**Year deployed**	**Range (KM)**	**Warheads x yield (kilotons)**	**Warheads (total available)**
UGM-133A Trident II D5	240	-	12000	Mk-4 warhead 1–8 W76-0 x 100 (MIRV)	25
				Mk-4A warhead 1–8 W76-1 x 90 (MIRV)	1511
				Mk-4A warhead (2019) 1–2 W76-2 x ***low (5-7)*** (MIRV)	n.a.
				Mk-5 warhead 1–8 W88 x 455 (MIRV)	384
Total	240	-	-		1920
Chinese Submarine-launched ballistic missiles					
Type/Designation	**No of launchers**	**Year deployed**	**Range (KM)**	**Warhead x yield1 (kilotons)**	**No of warheads**
JL-2	72	2016	7000+	1 x 200–300	72

Sea-based nuclear weapons systems are essential to preserving a second-strike capability and, therefore, are considered to 'secure' nuclear deterrence. US sea-based nuclear forces account for more than half of US nuclear weapons, as shown in the table above. SLBMs

[1278] John A. Tirpak, China's Expedited ICBM Program Has Been a Top US Secret, Shows Need for Speed, Hyten Says, *Air Force Magazine*, September 13, 2021, accessed September 25, 2021, https://www.airforcemag.com/china-expedited-icbm-program-top-secret-hyten-says/

[1279] Ibid

[1280] Kristensen and Korda, Chinese Nuclear Forces 2020; Kristensen and Korda, United States Nuclear Forces 2020; Liu Zhen, China fires its latest underwater nuclear missile into spotlight with science prize, *SCMP*, May 12, 2020, accessed September 25, 2020, https://www.scmp.com/news/china/military/article/3084063/china-fires-its-latest-underwater-nuclear-missile-spotlight

are capable of carrying MIRV-ed warheads. The US SLBMs account for 1920 out of a total 3,800 nuclear weapons. In China's case, SLBM accounts for 72 of a total 350 nuclear weapons; a total likely to grow because of new platforms, such as the Type-96 SSBN and an increase in the number of DF-41 ICBM.[1281] The DF-41, and JL-3, which are in the development phase, are expected to be capable of MIRVing.[1282]

Table 15. US vs. China: Air-based nuclear force comparison[1283]

US Strategic Bomber					
Type/Designation	**No.**	**Year deployed**	**Range (KM)**	**Warheads x yield (kilotons)**	**Warheads (total available)**
B-52H Strato-fortress	87/44	1961		ALCM/W80-1 x 5–150	528
B-2A Spirit	20/16	1994		B61-7/-11, B83-1	322
US Non-Strategic Force					
F-15E, F-16 DCA	n.a.	1979		1–5 B61-3/-4 bombs x 0.3–170	230
Chinese Strategic Bomber					
Type/Designation	**No of launchers**	**Year deployed**	**Range (KM)**	**Warhead x yield1 (kilotons)**	**No of warheads**
H-6	20	1965/2009	3100+	1 x bomb (1 x ALBM)	20

The total number of nuclear weapons assigned to the air-leg of the US nuclear triad is far greater than the total number of Chinese nuclear weapons assigned to this tier. The US has an advanced and well-established triad of nuclear forces. However, China is modernizing and expanding its nuclear forces, and a new role has been assigned to its strategic air force, as discussed in the previous chapter. It is intriguing to note that China's nuclear force modernization is focused on weaponry with strategic value, such as high-yield warheads on its ICBMs, SLBMs, and strategic bombers. Strategic nuclear weapons are designed to be used against large populations and industrial centers, with a political

[1281] Shannon Bugos and Julia Masterson, "New Chinese Missile Silo Fields Discovered," *Arms Control Today*, September 2021, accessed September 25, 2021, https://www.armscontrol.org/act/2021-09/news/new-chinese-missile-silo-fields-discovered; Missile Defense Project, "DF-41" (Dong Feng-41 / CSS-X-20)

[1282] Zhen, China fires its latest underwater nuclear missile into spotlight with science prize

[1283] Kristensen and Korda, "Chinese Nuclear Forces" 2019; Kristensen and Korda, "United States Nuclear Forces," 2019

objective to break the adversary's will to fight.[1284] However, current US nuclear force modernization focuses on non-strategic weapons, also known as tactical nuclear weapons (TNWs), that have a greater tactical value. Non-strategic weapons are primarily counter-force weapons to be used on the battlefield.[1285] They have shorter-range delivery systems and lower-yield warheads. This category may include nuclear mines, short and medium-range artillery, cruise missiles, SLBMs with a low-yield warhead, SLCMs, and forward deployable nuclear-capable F-35.[1286] However, the boundaries between strategic and non-strategic warheads are blurry. For instance, a non-strategic warhead aimed at strategic objectives, such as N3C, could generate an outcome equivalent to strategic nuclear weapons use.

For China, the priorities are strategic because China has capabilities to address contingencies at the regional level. China prioritized regional contingencies because it was initially a regional conflict involving Taiwan that led to China's nuclear intimidation by the US, as discussed in Chapters Two and Three. Afterward, the US deterrence was extended to Japan and South Korea and also shaped China's threat perception and influenced how it prioritized its force modernization. Now China's nuclear force modernization suggests that it is seeking to expand strategic capabilities to challenge extra-regional powers shaping its regional security outlook, such as the US, to address the nuclear threat from the US in the Western hemisphere. However, China's qualitative short and medium-range missile buildup suggests it generally had a regional focus. In contrast, however, the had US developed strategic capabilities during the Cold War to match Soviet capabilities for its forces in the Indo-Pacific, and the US now needs capabilities of tactical value for regional contingencies, particularly after China's large-scale nuclear force modernization. In short, China's strategic force modernization is calibrated such that it focuses on the continental US, but the US is trying to contain China in the Indo-Pacific, requiring sub-strategic or tactical engagement means. The next section focuses on China from the prism of new developments in the 2018 NPR, driven by China's nuclear force modernization. It appears that China has entrapped itself in a vicious circle of security-insecurity, exacerbating the US-China security dilemma; in an

[1284] "Nonstrategic Nuclear Weapons," *CRS*, Last updated, July 2021, accessed January 25, 2022, https://sgp.fas.org/crs/nuke/RL32572.pdf; Nikolai Sokov, "Tactical Nuclear Weapons (TNW)". *NTI*, April 30, 2002, accessed January 25, 2022, https://www.nti.org/analysis/articles/tactical-nuclear-weapons/
[1285] Ibid
[1286] "Nuclear Posture Review Report 2018"

attempt to make its defense formidable, China is inadvertently making itself more vulnerable.

6.6 US Employment of Nuclear Weapons

The 2018 NPR reflects that US policymakers are trying to regain what Lieber and Press viewed as the rise of US *nuclear primacy*, "the ability to destroy all of an adversary's nuclear forces, eliminating the possibility of a retaliatory strike, is known as a first-strike capability, or nuclear primacy."[1287] Lieber and Press argued in 2006 that US improvement of its relative nuclear capabilities in the nuclear domain stems from "a series of improvements in the United States' nuclear systems, the precipitous decline of Russia's arsenal, and the glacial pace of modernization of China's nuclear forces."[1288] That analysis is now out-of-date, as since 2015, the pace of China's nuclear force modernization has dramatically increased.[1289] In a later 2016 article, Liber and Press argued that the US is intentionally pursuing strategic primacy,

> In nearly every realm of warfare: for example, ballistic missile defense, antisubmarine warfare, intelligence surveillance-and-reconnaissance systems, offensive cyber warfare, conventional precision strike, and long-range precision strike, in addition to nuclear strike capabilities.[1290]

The US nuclear forces are still relatively more robust and well-equipped than any other nuclear weapons state, and the idea of sustaining or achieving US nuclear primacy vis-à-vis China is seemingly an attainable one, albeit fraught given China and Russia are reacting to ensure the US cannot achieve it. Lieber and Press suggest US efforts here seek a counterforce revolution based on the argument that "nuclear exchanges may not lead to mutual devastation – one party may suffer far less or even be spared entirely."[1291] Matthew Kroenig also argues,

> military nuclear advantage above and beyond a secure, second-strike capability can contribute to a state's national security goals. This is primarily because a robust nuclear force reduces a state's expected cost of

[1287] Keir A. Lieber and Daryl G. Press, "The Rise of U.S. Nuclear Primacy," *Foreign Affairs*, Vol. 85, No. 2, (2006), 42-44
[1288] Ibid., 43
[1289] Korda and Kristensen, "China Is Building A Second Nuclear Missile Silo Field"; Julia Masterson and Shannon Bugos, "Pentagon Warns of Chinese Nuclear Development," *Arms Control Association*, October 2020, accessed September, 27, 2021, https://www.armscontrol.org/act/2020-10/news/pentagon-warns-chinese-nuclear-development; Gerald C. Brown, "Understanding the Risks and Realities of China's Nuclear Forces," *Arms Control Association*, June 2021, accessed September, 27, 2021, https://www.armscontrol.org/act/2021-06/features/understanding-risks-realities-chinas-nuclear-forces
[1290] Keir A. Lieber and Daryl G. Press, "The New Era of Nuclear Weapons, Deterrence, and Conflict," *Strategic Studies Quarterly*, Vol. 10, No. 5 (2016), 33
[1291] Lieber and Press, "The New Era of Nuclear Weapons," 39

> nuclear war, increasing its resolve in high-stake crises, providing it with coercive bargaining leverage, and enhancing nuclear deterrence.[1292]

Kroenig further argues that this nuclear superiority, not parity, contributes to strategic stability.[1293] In this regard, the 2020 Joint Nuclear Operations notes,

> Flexible and limited US nuclear response options can play an important role in restoring deterrence following limited adversary nuclear escalation. Restoring deterrence through such responses is not certain, but it may be achievable in certain circumstances. Successfully restoring deterrence of nuclear use would contribute to limiting damage in a conflict and to the achievement of US and allied war aims.[1294]

The 2018 NPR rejects a "no first use" policy, stating, "such a policy is not justified today."[1295] The no NFU policy is maintained to ensure the credibility of the US extended deterrence. Without it, US allies might believe that the US will employ nuclear weapons only if it (not its allies) is attacked with nuclear weapons, leaving them vulnerable to conventional and nuclear attack.[1296] In turn, this could compel US allies to acquire their own nuclear deterrent. Though the 2018 NPR tries to keep "some ambiguity regarding the precise circumstances that might lead to a U.S. nuclear response," it does explicitly maintain that the US could resort to nuclear weapons in extreme circumstances in response to "significant non-nuclear strategic attacks."[1297] According to the NPR, it includes but is not limited to "attacks on U.S., allied, or partner civilian population or infrastructure."[1298] Moreover, the circumstances in which the US could resort to nuclear weapons include "attacks on U.S. or allied nuclear forces, their command and control, or warning and attack assessment capabilities."[1299] Such views, therefore, are in support of the stance that the NPR rejects the policy of "sole purpose," which posits that the sole purpose of the use of nuclear weapons is to deter nuclear attacks only.[1300] In Washington, there are discussions that the Biden administration might revisit the no NFU policy after

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[1292] Matthew Kreonig, *The Logic of American Nuclear Strategy: Why Strategic Superiority Matters* (New York: Oxford University Press, 2018), 1-15
[1293] Ibid
[1294] Joint Nuclear Operations, Joint Publication 3-72, Department of Defense, April 17, 2020, accessed September 26, 2021, https://irp.fas.org/doddir/dod/jp3_72_2020.pdf
[1295] Lieber and Press, "The Rise of U.S. Nuclear Primacy," 22
[1296] Joe Gould, "Debate on 'no first use' of nukes mushrooms in Washington," *Defense News*, October 7, 2021, accessed January 27, 2022, https://www.defensenews.com/congress/2021/10/06/debate-on-no-first-use-of-nukes-mushrooms-in-washington/; U.S. Nuclear Weapons Policy: Considering "No First Use," *CSR*, Updated October 13, 2021, accessed January 27, 202, https://sgp.fas.org/crs/nuke/IN10553.pdf
[1297] "The 2018 NPR," 22
[1298] Ibid., 21
[1299] Ibid
[1300] Ibid., VII

consulting allies and partners in Europe and Asia mid this year (2022).[1301] However, as discussed earlier, it remains a declaratory part of US policy at present.

For China, the prospects that the US may secure nuclear primacy and a feasible first-strike capability is in direct opposition to China's NFU policy. It raises the prospect the US will involve nuclear weapons in a conflict if a significant non-nuclear strategic attack is launched against the US or its allies. If the US failed to limit the damage, it would escalate to the use of strategic nuclear weapons. According to the 2018 NPR,

> the United States will maintain the capability to credibly threaten intolerable damage as Chinese leaders calculate costs and benefits, such that the costs incurred as a result of Chinese nuclear employment, at any level of escalation, would vastly outweigh any benefit.[1302]

Moreover, it would allow the US and allies to initiate a war and keep the escalation level in their favor. Limiting damage, as discussed above, is the key element of warfighting. Similarly, attacks on the US or allied nuclear forces, command and control, warning, and attack assessment capabilities could draw a nuclear retaliation from the US. This stance also discourages China from pursuing a damage limitation strategy, as such a strategy would require a counter-force attack on the US and allies to disrupt and deplete their resources completely, a capability that China will be likely to lack for the foreseeable future despite its modernization program.[1303]

Moreover, the NPR envisions multiple roles for nuclear weapons other than nuclear deterrence, such as "deterrence against non-nuclear attack, assurance to allies and partners, achievement of U.S. objectives if deterrence fails, and capacity to hedge against an uncertain future."[1304] Hence, the NPR entails different nuclear weapon-use.[1305] This implies using them to defend US strategic interests in the Indo-Pacific region and allies such as Japan and South Korea. The damage limitation strategy and intra-war deterrence would require the US to fight and win a limited nuclear war. A limited nuclear war would require limited objectives, limited geography to fight a war upon, limited time, and

[1301] Gould, "Debate on 'no first use' of nukes mushrooms in Washington; U.S. Nuclear Weapons Policy: Considering 'No First Use'," *CSR*,
[1302] "Nuclear Posture Review Report 2018," 32
[1303] Office of the Secretary of Defense, "Annual Report to Congress: Military and Security Developments Involving the People's Republic of China," accessed September 17, 2020, https://media.defense.gov/2020/Sep/01/2002488689/-1/-1/1/2020-DOD-CHINA-MILITARY-POWER-REPORT-FINAL.PDF
[1304] "Nuclear Posture Review Report 2018," vii
[1305] Ibid, xi

limited use of available weaponry.[1306] If this is the objective, the deployment of new low-yield and new sea-launch cruise missiles are steps to enabling it.

6.6.1 Low-Yield Nuclear Weapons

The 2018 NPR notes, "expanding flexible U.S. nuclear options now, to include low-yield options, is important for the preservation of credible deterrence against regional aggression.[1307] The NPR further notes that,

> Our tailored strategy for China is designed to prevent Beijing from mistakenly concluding that it could secure an advantage through the limited use of its theater nuclear capabilities or that any use of nuclear weapons, however limited, is acceptable.[1308]

Some Chinese hardliners have advocated in favor of indigenous efforts to attain their own low-yield capability.[1309] This is logical, given that new changes in the 2018 NPR might render China's nuclear capability inadequate. China does not possess a low-yield nuclear warhead and would require nuclear testing to develop one.[1310] Therefore, Chinese hardliners suggest China should have its own limited capability to ensure a limited or graduated response capability.[1311]

Previously, the Obama administration's 2010 NPR affirmed that warhead development "will not support new military missions or provide for new military capabilities."[1312] However, the Trump administration's NPR explains that the low yield options "will help counter any mistaken perception of an exploitable 'gap' in U.S. regional deterrence capabilities."[1313] The administration believed that Beijing had mistakenly concluded that it could secure an advantage through the limited use of nuclear weapons.[1314] The NPR argues that such a capability would provide the US with an option to ensure a prompt

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[1306] John Baylis, Ken Booth, John Garnett, and Phil Williams, *Contemporary Strategy: Theories and Policies* (New York: Holmes and Meier Publishers, 1975), 121-122
[1307] "Nuclear Posture Review Report 2018," xii
[1308] Ibid., 32
[1309] Raymond Wang, "Making Sense of Chinese Reactions to the US 2018 Nuclear Posture Review," *The Diplomat*, February 27, 2018, accessed August 2, 2020, https://thediplomat.com/2018/02/making-sense-of-chinese-reactions-to-the-us-2018-nuclear-posture-review/; David C. Logan, "Hard constraints on a Chinese nuclear breakout," *The Nonproliferation Review*, Vol. 24, No. 1-2, (2017), 13-30
[1310] Ibid
[1311] Ibid; also see "Social Commentary: The U.S. strengthens its nuclear superiority, but China cannot take it lightly," *Global Times*, January 9, 2018, accessed August 2, 2020, https://opinion.huanqiu.com/article/9CaKrnK6hn9; "Global Times: U.S.'s big nuclear fire burns its eyebrows," *Global Times*, February 5, 2018, accessed August 2, 2020, https://news.sina.com.cn/o/2018-02-05/doc-ifyremfz4996202.shtml
[1312] "Nuclear Posture Review Report 2010," xiv
[1313] "Nuclear Posture Review Report 2018," xii
[1314] Ibid., 32

response option that is able to penetrate adversary defenses.[1315] For China, it might be difficult to differentiate between strategic and sub-strategic SLBM or SLCM, which may complicate the ability of decision-makers in Beijing to appropriately choose which retaliation or escalation options are best suited in a military crisis or conflict. Moreover, China may not consider it a limited strike or just a strike to ensure damage limitation.

6.6.2 New Sea-Launched Cruise Missiles (SLCM)

Concerning the new SLCM, the 2018 NPR referred to both Russia and China, stating that a modern nuclear-armed SLCM "will provide a needed non-strategic regional presence, [and] an assured response capability."[1316] In addition, the document notes that the previously deployed nuclear-armed SLCMs, which were retired from active service during the Obama administration, had contributed to maintaining deterrence and assuring allies for decades, particularly in Asia.[1317] Therefore the administration will "restore [out of active service nuclear-armed SLCMs that awaiting to be dismantled] this capability by initiating a capabilities study leading to an Analysis of Alternatives (AoA) for the rapid development of a modern SLCM. It will strengthen the effectiveness of the sea-based nuclear deterrence force."[1318] The NPR notes that both a modified nuclear warhead and the modern SLCM will enhance,

> our ability to tailor deterrence and assurance; expand the range of credible U.S. options for responding to nuclear or non-nuclear strategic attack; and, enhance deterrence by signaling to potential adversaries that their concepts of coercive, limited nuclear escalation offer no exploitable advantage.[1319]

Many of the objectives associated with the modern SLCM and low-yield nuclear warhead mentioned in the NPR are related to the Indo-Pacific. The document notes that previously nuclear-armed SLCMs had played a vital role in maintaining deterrence and assurances, particularly in Asia.[1320] Therefore, the changes in the NPR suggest that China's nuclear missile force, such as the DF-21D, the DF-21E, the DF 26, the DF-26B, and the DF-17 (HGV), have generated a gap in US-China strategic capabilities, which might provide China with a window of strategic opportunity to strike the US aircraft carriers and other

[1315] Ibid., 55
[1316] Ibid., xii
[1317] "Nuclear Posture Review Report 2018," 55
[1318] "Nuclear Posture Review Report 2018," 55
[1319] Ibid
[1320] "Nuclear Posture Review 2018 date," vii, 55

strategic developments in the region, including Guam.[1321] The development of a modern SLCM and low-yield nuclear warheads is an effort to bridge this gap and reassure allies of the US's commitments.

6.7 Risk of Nuclear War and the Security Dilemma

To avoid a nuclear war requires understanding the emerging threat environment. Several factors could be instrumental in whether a nuclear war between the US and China eventuates, including their contentious history and lack of trust, their emerging security policies, and poor understanding of each other's security policies and intentions.

The US and China have a contentious history. US policymakers view communist China and its political system as a threat to the US-led world order.[1322] Some opine that China is a revisionist power opposed to US interests, allies, and the existing liberal rules-based international system.[1323] Scholars of international politics, such as Hugh White, believe that China's policymakers seek to "change the regional order" led by the US.[1324] John Mearsheimer asserts that China wants to "dominate Asia," [1325] whereas Chinese policymakers claim that the US exaggerates Beijing's objectives, which are defensive, and seeks to ensure China's power remains limited by pursuing a policy to isolate China

[1321] Missile Defense Project, DF-17, *Missile Threat*, Center for Strategic and International Studies, February 19, 2020, last modified August 2, 2021, accessed September 28, 2021, https://missilethreat.csis.org/missile/df-17/; Jordan Wilson, "China's Expanding Ability to Conduct Conventional Missile Strikes on Guam," *U.S.-China Economic and Security Review Commission*, May 10, 2016, accessed September 28, 2021, https://www.uscc.gov/Research/china%E2%80%99s-expanding-ability-conduct-conventional-missile-strikes-guam; IHS Jane's 360, "Eurosatory 2016: Regional Focus, Asia Pacific," June 16, 2016, accessed September 28, 2021, http://www.janes.com/article/61438/regional-focus-asia-pacific-es2016d4; Missile Defense Project, DF-21, *Missile Threat*, Center for Strategic and International Studies, April 13, 2016, last modified July 31, 2021, accessed September 28, 2021, https://missilethreat.csis.org/missile/df-21/

[1322] Michael J. Mazarr, Timothy R. Heath and Astrid Stuth Cevallos, *China and the International Order* (Santa Monica, Calif.: RAND Corporation, 2018); also see Nadege Rolland, "China's Vision for a New World Order," *The National Bureau of Asian Research*, Special Report #83, January 2020, August 15, 2020, https://www.nbr.org/wp-content/uploads/pdfs/publications/sr83_chinasvision_jan2020.pdf

[1323] Caitlin Byrne, "Securing the 'Rules-Based Order' in the Indo-Pacific: The Significance of Strategic Narrative," *Security Challenge,s* Vol. 16, No. 3, (2020), 10-15; Malcolm Jorgensen, "China is overturning the rules-based order from within," *The Interpreter*, August 12, 2020, accessed January 27, 2022, https://www.lowyinstitute.org/the-interpreter/china-overturning-rules-based-order-within; Mira Rapp-Hooper, Michael S. Chase, Matake Kamiya, Shin Kawashima, Yuichi Hosoya, "Responding to China's Complicated Views on International Order," *CEIP*, October 10, 2019, accessed January 27, 2022, https://carnegieendowment.org/2019/10/10/responding-to-china-s-complicated-views-on-international-order-pub-80021

[1324] Huge White, "Is America Willing to Wage War Against China to save the Status Quo?" *The National Interest*, April 19, 2016, accessed August 21, 2020, www.nationalinterest.org/blog/thebuzz/america-willing-wage-war-against-china-save-thestatus-quo-15836

[1325] John Mearsheimer, "Can China Rise Peacefully?" *The National Interest*, October 25, 2014, accessed August 21, 2020, http://nationalinterest.org/commentary/can-china-risepeacefully-10204.

and portray its state-led economic and techno-autocratic system, presided over by one-party Communist leadership, as a "virulent strain of communism."[1326]

On September 17, 2020, a visit to Taiwan by the US Undersecretary for Economic Growth, Energy, and the Environment, Keith Krach, revealed the Trump administration's increasing efforts to counter China's bid to isolate Taiwan diplomatically.[1327] The increased frequency of US Freedom of Navigation Operations (FONOPs) since 2015 to challenge China's sovereignty claims and security guarantees to Taiwan and allies in the Indo-Pacific are viewed by Beijing as efforts to contain China's increasing influence.[1328] This reflects a chain reaction of behavior based on the security dilemma in the strategic policies of both states, shown below in the Tables 16 (see pp. 280-281). The challenges identifying whether a security dilemma is in operation will now be considered.

6.7.1 Challenges Identifying a Security Dilemma

As discussed earlier in Chapter One and to mention it briefly here, John Herz, who coined the term security dilemma, writes, "it is one of the tragic implications of the security dilemma that mutual fear of what initially may never have existed may subsequently bring about exactly that which is feared most."[1329] He viewed the security dilemma as a *vicious circle* in the international system. The insecurity and fear of being attacked motivates states to accumulate more power to defend themselves, generating an action-reaction struggle for power among states.[1330] This means the *security dilemma eventually becomes self-undermining* because it generates tit-for-tat responses by other states that ultimately undermine the security of all.[1331] Robert Jervis notes that the security dilemma exists when "many of the means by which a state tries to increase its security decrease the

[1326] Yang Sheng and Wang Qi, "'Zero chance' for US to isolate China," *Global Times*, July 15, 2020, Accessed September 18, 2020, https://www.globaltimes.cn/content/1194660.shtml; also see Michael R. Pompeo, "Communist China and the Free World's Future," *U.S. Department of State*, July 23, 2020, accessed September 18, 2020, https://www.state.gov/communist-china-and-the-free-worlds-future/
[1327] Amy Qin, "U.S. Official Visits Taiwan, and China Warns of Consequences," September 17, 2020, accessed September 19, 2020, https://www.nytimes.com/2020/09/17/world/asia/us-official-taiwan-china.html
[1328] Ibid; Karen Leigh, Peter Martin and Adrian Leung, "Troubled Waters: Where the U.S. and China Could Clash in the South China Sea," *Bloomberg*, December 17, 2020, accessed September 28, 2021, https://www.bloomberg.com/graphics/2020-south-china-sea-miscalculation/; Timothy Mclaughlin, "Is this Taiwan's Moment?" May 16, 2020, accessed September 18, 2020, https://www.theatlantic.com/international/archive/2020/05/taiwan-china-who-coronavirus-pandemic/611737/
[1329] John Herz, *International Politics in the Atomic Age* (New York: Columbia University Press, 1961), 241
[1330] John Herz, *Political Realism and Political Idealism: A Study in Theories and Realities* (Chicago: University of Chicago Press, 1951), 157
[1331] Ibid., 12; Herz, *International Politics in the Atomic Age*, 234-235

security of others."[1332] Jervis viewed statecraft as being driven by *fear under anarchy*, therefore, even two peaceful states may view each other's defensively-orientated deployments to be motivated by offensive designs. He writes that the scale and nature of the security dilemma rest upon two major variables: the offense-defense balance, and offense-defense differentiation (whether weapons and policies that protect the state also provide the capability for attack) of relative military forces between states, leading to the security dilemma and a spiral of arms races.[1333]

There are some challenges in identifying when a security dilemma situation truly exists, such as identifying the intentions of a state, especially if a state has defensive intentions but it is trying to improve its security positions via assertive military means or policies.[1334] Central to addressing these complicated challenges are material and psychological conditions, which influence a state's security policy decision-making process. [1335] Material conditions may involve military capabilities, such as the nature and type of weaponry, military doctrine, and psychological conditions that involve evaluating and determining the state's motives and intentions.[1336] Together with the structural condition of anarchy and the related uncertainty over the intentions of others, and concerns over the future, a state's threat perception can be easily exacerbated, and worst-case assumptions can be adopted. If not mitigated, this heightened threat perception can create spirals of mistrust, arms race, and even war.[1337] John Herz writes,

> Wherever…anarchic society has existed there has arisen what may be called the 'security dilemma' of men, or groups, or their leaders…concerned about their security from being attacked…annihilated by other groups and individuals. Striving to attain security…they are driven to acquire more and more power in order to escape the impact of the power of others. This, in turn, renders the others more insecure and

[1332] Robert Jervis, "Cooperation Under the Security Dilemma," *World Politics* Vol. 30, No.2, (January 1978), 169

[1333] Jervis, "Cooperation Under the Security Dilemma," 167-214; Robert Jervis, "Was the Cold War a Security Dilemma?" *Journal of Cold War Studies* Vol. 3, No.1, (Winter 2001), 55-56 and Robert Jervis, *The Meaning of the Nuclear Revolution: Statecraft and the Prospect of Armageddon* (Cornell University Press, London, 1989), 64-66, 116

[1334] Charles Glaser, "The Security Dilemma Revisited," *World Politics*, Vol. 50, No. 1, (1997) 171-201; Shiping Tang, The Security Dilemma: A Conceptual Analysis, *Security Studies*, Vol. 18, No. 3, (2009), 587-623; Ken Booth and Nicholas J Wheeler, *The Security Dilemma: Fear, Cooperation, and Trust in World Politics* (London: Palgrave Macmillan, 2008)

[1335] Ibid

[1336] Schelling, *Arms and Influence*

[1337] Marc Trachtenberg, *History and Strategy* (Oxford; Princeton, NJ: Princeton University Press, 1991); Alexander Wendt, "Anarchy is what states make of it: The Social Construction of Power Politics," *International Organization*, Vol. 46, No. 2, (Spring, 1992), 391-425; Andrew Kydd, Sheep in Sheep's Clothing: Why Security Seekers do not Fight Each Other, *Security Studies*, Vol. 7, No. 1, (1997), 114-155

> compels them to prepare for the worst…the vicious circle of security and power accumulation is on.[1338]

In preparing for the worst, states committed to maintaining the status quo might also appear compelled to use force to acquire more security.[1339] This could lead states to launch a preventive and pre-emptive war against each other, even if their intentions are defensive. As Robert Jervis notes, "one state's gain in security often inadvertently threatens others."[1340] While agreeing with Herz's view that the security dilemma is structural in nature, Jervis made an addition to the non-structural variables of the security dilemma. Jervis calls these non-structural variables 'severity regulators' of the security dilemma.[1341] Therefore, for Jervis, the security of one state can *unintentionally* make other states feel less secure due to structural reasons.

From the security dilemma perspective, US-China security relations could be contextualized with reference to the 'China threat' theory. Since 1990, and specifically after 9/11, scholars from the US and the West began to argue that China's economic power would translate into greater levels of military power and soon become a regional power.[1342] Scholars such as Mearsheimer wrote that to push the US out of Asia, China would likely implement a Monroe Doctrine of its own in Asia.[1343]

After the financial crisis of 2008, China stopped using the rhetoric of peaceful rise it used throughout the 1990s. Through this, it emphasized regional economic integration and multilateral confidence-building measures (CBMs) to address the growing fears of its

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[1338] John H. Herz, "Idealist Internationalism and the Security Dilemma," *World Politics*, Vol. 2, No. 2, (January 1950), 157

[1339] John H. Herz, *Political realism and political idealism: A study in theories and realities* (Chicago: University of Chicago Press, 1951), 15

[1340] Robert Jervis, "Cooperation under the Security Dilemma," *World Politics*, Vol. 30, No. (2), (January 1978), 167-214

[1341] Robert Jervis, *Perception and Misperception International Politics*, (Princeton, NJ: Princeton University Press, 1976), 74-77

[1342] Alastair Iain Johnston, "China's New 'Old Thinking': The Concept of Limited Deterrence," *International Security*, Vol. 20, No. 3, (1995/1996), 26; Andrew Scobell, *China's Use of Military Force: Beyond the Great Wall and the Long March*, (New York, NY: Cambridge University Press, 2003), 16-23; Michael D. Swaine and Ashley J. Tellis, *Interpreting China's Grand Strategy: Past, Present and Future*, (Santa Monica, CA: RAND Corporation 2000); Avery Goldstein, *Rising to the Challenge: China's Grand Strategy and International Security*, (Stanford, CA: Stanford University Press, 200)

[1343] John J. Mearsheimer, *The Tragedy of Great Power Politics* (New York; London: Norton, 2001); Robert D. Kaplan, "The Geography of Chinese Power," *New York Times*, April 19, 2010, accessed October 2, 2020, https://www.nytimes.com/2010/04/20/opinion/20iht-edkaplan.html; Alastair Iain Johnston, "Beijing's Security Behaviour in the Indo-Pacific: Is China a Dissatisfied Power?" in J.J. Suh, Peter J. Katzenstein and Allen Carlson eds., *Rethinking Security in East Asia (Studies in Asian Security).* (Stanford, CA: Stanford University Press, 2004), 34-96

neighbors.[1344] Some analysts identified a "new assertiveness" in China's foreign policy driven by the reduction of the relative power gap between the US and China in the Indo-Pacific.[1345] In June 2013, President Xi Jinping presented an idea for a "new model for great power relations," which was apparently based on "no confrontation or military conflict; mutual respect; and seeking cooperation and 'win-win' outcomes."[1346] It also suggests the power discrepancies parity between the US and China had reduced to a level that, in Beijing's view, led them to assume something fundamentally 'new' was possible in US-China relations, and perhaps in China's view of its role vis-à-vis the existing international order and a rules-based system.[1347] Rather than simply acting as a bystander, it would now look to take a more proactive role in shaping its relationships with other great powers and vis-à-vis the Indo-Pacific and international system.

China's new assertiveness, whether or not reflective of the changing power balance, suggests China has become a much more powerful and confident state. China's behavior – that would become increasingly assertive throughout the 2010s and through to 2022 – came to be viewed as a critical source of insecurity by other states in the Indo-Pacific region, particularly for the US partners and allies, such as Japan, Australia, South Korea, and Taiwan.[1348] The following table suggests a tit-for-tat spiral between the US and China, akin to a security dilemma.

[1344] Thomas J. Christensen, "The Advantages of an Assertive China: Responding to Beijing's Abrasive Diplomacy," *Brookings*, March 25, 2011, accessed September 29, 2021, https://www.brookings.edu/articles/the-advantages-of-an-assertive-china-responding-to-beijings-abrasive-diplomacy/

[1345] Alastair Iain Johnston, "How New and Assertive is China's New Assertiveness?" *International Security*, Vol. 37, No. 4, (2013), 7-48; Michael D. Swaine, "Perceptions of an Assertive China," *China Leadership Monitor*, 32 accessed October 3, 2020, https://carnegieendowment.org/files/CLM32MS1.pdf; Aaron Friedberg, "The Sources of Chinese Conduct: Explaining Beijing's Assertiveness," *The Washington Quarterly*, Vol. 37, No. 4, (2014), 133-134; David Shambaugh, "The Year China Showed its Claws," *The Financial Times*, February 17, 2010, accessed October 3, 2020, https://www.ft.com/content/7503a600-1b30-11df-953f-00144feab49a

[1346] Stephen J. Hadley, "America, China and the 'New Model of Great-Power Relations," *Lowy Institute*, accessed October 3, 2020, https://www.lowyinstitute.org/publications/america-china-and-new-model-great-power-relations

[1347] Ibid

[1348] Swaine, "Perceptions of an assertive China,"; Friedberg, "The Sources of Chinese conduct"

Table 16: A timeline of the security dilemma, 2011-2021[1349]

Year	US	Year	China
2011	The US announced Pivot to Asia policy	**2013**	President Xi comes to power
2012	Pivot to Asia: The US announced that it will redistribute naval forces; 60% to the Pacific and 40% the Atlantic by 2020, and the Pacific will be the primary focus of the US	**2013**	General political and military reforms announced
		2013	East China Sea Identification Zone established
		2015	China announced Comprehensive military and nuclear modernization. South China Sea Militarization accelerates
2016	Five Aegis BMD-capable US navy ships deployed in Japan	**2016**	Responding to THAAD announcement, the PRC Ministry of National Defense suspended high-level defense dialogue with South Korea, postponed the South Korean defense minister's visit to China. China's National Tourism Administration reduced tourists to South Korea by 20%
2016	US-South Korea agreed to THAAD deployment		
2017	US deployed THAAD in South Korea		THAAD's X-band radar weakens China's nuclear deterrence stability. "THAAD provides only minimal defense against North Korean missiles and therefore must be targeted at China THAAD causes instability on the Korean Peninsula and will lead to a regional arms race."[1350] China imposed a ban on South Korean food, exports dropped 5.6% year-on-year in March 2017. South Korean carmakers Hyundai and Kia dropped 52% year-on-year in March 2017. Chinese tourists visiting South Korea dropped 66% China launched a cyberattack on a group linked with THAAD to gather intelligence[1351]
2017	End of THAAD Dispute; China economic coercion changed South Korea's strategic outlook. "South Korea's Foreign Minister Kang Kyung-wha stated in a National Assembly that Seoul had no intention to install additional THAAD batteries, participate in a regional missile defense system, and form a trilateral alliance with the United States and Japan."[1352]		

[1349] "Updated Charts: Taiwan Arms Sales 1990-2020," *Taiwan Defense and National Security*, accessed June 1, 2021, https://www.ustaiwandefense.com/taiwan-arms-sales-notified-to-congress-1990-2020/; Leon Panetta: "US to deploy 60% of navy fleet to Pacific," *BBC News*, June 2, 2012, accessed September 29, 2021, https://www.bbc.com/news/world-us-canada-18305750; Michael D. Swaine, "Chinese Views on South Korea's Deployment of THAAD," *China Leadership Monitor*, No. 52, 2, 6

[1350] Swaine, "Chinese Views on South Korea's Deployment of THAAD," 6

[1351] Joshua Berlinger and Juliet Perry, "China Tries to Hack Group Linked to Controversial Missile Defense System, U.S. Cybersecurity Firm Says," *CNN*, April 27, 2017, accessed September 29, 2021, https://edition.cnn.com/2017/04/27/asia/china-south-korea-thaad-hack/index.html

[1352] Jeongseok Lee, "Back to Normal? The End of the THAAD Dispute between China and South Korea," *China Brief*, Vol. 17, Issue 15

2018	US NPR The Asia Reassurance Initiative Act (ARIA): To promote US security, economic interests, and values in the Indo-Pacific[1353] $0.33 billion arms sales to Taiwan in 2020	**2017**	In 2017 China constructed 72 aircraft hangars in the Spratlys, Fiery Cross Mischief, and Subi Reefs, and 16 on Woody Island
		2019	Defense White Paper
2019	$10.72 billion arms sales to Taiwan in 2020	**2020**	China deployed road, rail, and silo-based DF-41, capable of 10xMIVing warheads
2020	$5.86 billion arms sales to Taiwan in 2020	**2020**	China test-fired so-called carrier killer missiles into the South China Sea 380 PLAAF incursion in Taiwan ADIZ, largest since 1996 Taiwan Strait Crisis
2021	President Biden convened the QUAD meeting US and Japan pledge to strengthen alliance to counter China's rise US Senate Foreign Relations Committee approves the Strategic Competition Act of 2021 against China The US approved a $0.75 billion arms sale to Taiwan US, UK, and Australia forge a new military alliance (AUKUS)	**2021**	Twenty-five Chinese air force aircraft, including anti-submarine and early warning aircraft and nuclear-capable bombers, entered Taiwan's ADIZ: the largest reported incursion to date. China operationalizes the HQ-19 system, similar to the US THAAD Newly found China nuclear missile silo fields

Although the 2018 NPR rejects NFU and instead supports nuclear force modernization, which the Biden administration is continuing, the 2018 NPR notes that the US will "continue to seek a meaningful dialogue with China on our respective nuclear policies, doctrine, and capabilities in pursuit of a peaceful security environment and stable relations."[1354] Moreover, the tailored strategy for China and emphasis on strategic stability suggest US intentions are defensive but it has the "capability to respond effectively to Chinese limited nuclear use if deterrence were to fail."[1355] China's premium on NFU and nuclear use in case of a nuclear attack, also reflect the defensive orientation of its nuclear strategy, at least at the declaratory level. These apparently defensive

[1353] "The Asia Reassurance Initiative Act (ARIA) of 2018," *In Focus*, CSR, Updated April 4, 2019, accessed September 30, 2021, https://sgp.fas.org/crs/row/IF11148.pdf
[1354] "The 2018 NPR," 32
[1355] Ibid

intentions fulfil the defensive characteristic of the security dilemma (a security dilemma does not exist between states with offensive intent as, in that situation, there is no dilemma other than to arm oneself and prepare for conflict) that its proponents highlight, as discussed in previous chapters.

The complex action-reaction and the mutual lack of flexibility in establishing new arms control agreements and other arrangements related to strategic stability can be said to create and exacerbate the US-China security dilemma.[1356] This security dilemma is also visible from their security policies, such as force modernization plans, defense strategies, and budgets designed to balance against each other. Johnston has argued that the security dilemma between the US and China is mutual and can only be ameliorated mutually and, in recent years, neither has shown willingness to mutually agree to limits in terms of their military arrangements vis-à-vis the other.[1357]

6.7.2 Nuclear Weapons and the Security Dilemma

In the nuclear realm, where nuclear weapons are considered the primary source of deterrence, if states are preparing to fight and win a nuclear war, a nuclear security dilemma could have adverse effects on general security relations. China's nuclear weapons force modernization, including the qualitative and quantitative increase in the numbers of nuclear weapons and delivery platforms, reinforces the growing perception of Chinese assertiveness towards the US and its allies; in turn, it encourages them to take their own assertive measures in response. The growing perceived insecurity of the US has pushed it to take measures given it perceives the balance is shifting or could shift away from it in key regions. This is why the US response is predominantly regional (Indo-Pacific), as reflected in the 2018 NPR and discussed above. The 2018 NPR strategizes fighting and winning a limited nuclear war at the regional level. The US-led robust regional security framework may be partly designed to keep the nuclear security dilemma limited to the Indo-Pacific and to the periphery of China with the help of the US allies, such as South Korea, Japan, and Australia. It seeks to limit the dilemma from extending

[1356] Joshua Berlinger and Juliet Perry, "China Tries to Hack Group Linked to Controversial Missile Defense System, U.S. Cybersecurity Firm Says, *CNN*, April 27, 2017, accessed September 29, 2021, https://edition.cnn.com/2017/04/27/asia/china-south-korea-thaad-hack/index.html
Journal of Contemporary China, Vol. 21, No. 76, 713-721; Graham Allison, Thucydides' trap has been sprung in the Pacific, *The Financial Times*, August 12, 2012, accessed October 3, 2020, https://www.ft.com/content/5d695b5a-ead3-11e1-984b-00144feab49a
[1357] Johnston, Beijing's security behaviour in the Asia-Pacific, 54; also see Robert Jervis, Cooperation under the security dilemma, *World Politics*, Vol. 30, No. 2, 181

to the Western hemisphere, limiting China's escalation options, specifically by forcing China's SSBN maneuvers to remain within the bastion sea by deploying anti-submarine warfare radars, underwater drones, and SSBNs in the strategic locations. Moreover, the new low-yield nuclear weapons, SLCM and LRSO, would allow the US to operate independently during a crisis without relying on regional allies. These responses from the US will further generate a spiral of uncertainty and mistrust China, potentially dragging both states into an ever-more vicious security dilemma cycle, leading to the worsening of strategic instability and potentially, to an arms race.

Over the past three decades, the defense budget of China has remained approximately 2 percent of its GDP.[1358] Since China's GDP has grown remarkably in the past three decades, the total size of the 2 percent expenditure on the defense of the overall GDP has also grown dramatically. However, in total, the US spent $778 billion, and China spent $252 billion in 2020 on defense.[1359] It is worth noting that the US, with $778 billion, manages a military with global commitments, and is involved in ongoing conflicts in the Middle East (although its manpower has decreased to a minimal level due to withdrawals from Iraq and Afghanistan). In contrast, the Chinese military has solely regional commitments and has not been involved in any major conflict beyond its borders for the past four decades.[1360] Therefore, even though China's total military spending is much less than that of the US, given that its focus is more targeted on its immediate region, it may not be a military disadvantaged relative to the US that comparing only the sheer spending figures would suggest.

The 2015 and 2019 DWP of China respectively highlighted "hegemonism, power politics, unilateralism and neo-interventionism" as threats it faced from the US.[1361] Therefore,

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[1358] Stockholm International Peace Research Institute (SIPRI) "Military Expenditure Database 2019, "accessed August 21, 2020, https://www.sipri.org/sites/default/files/Data%20for%20all%20countries%20from%201988%E2%80%932019%20as%20a%20share%20of%20GDP.pdf

[1359]"World military spending rises to almost $2 trillion in 2020," *SIPRI*, April 26, 2021, accessed January 27, 2022, https://sipri.org/sites/default/files/Data%20for%20all%20countries%20from%201988%E2%80%932020%20in%20constant%20%282019%29%20USD%20%28pdf%29.pdf

[1360] "Wars that the People's Republic of China fought," *The Economics Times*, Last Updated: December 20, 2009, September 4, 2020, https://economictimes.indiatimes.com/special-report/wars-that-peoples-republic-of-china-fought/articleshow/5357547.cms

[1361] The Information Office of the State Council, "China's Military Strategy, May 2015," accessed August 19, 2020, http://english.www.gov.cn/archive/white_paper/2015/05/27/content_281475115610833.htm; The Information Office of the State Council, "China's National Defense in the New Era, July 2019, " accessed August 19, 2020, https://www.andrewerickson.com/2019/07/full-text-of-defense-white-paper-chinas-national-defense-in-the-new-era-english-chinese-versions/

responding to these security threats, the white paper declared that China would keep investing in missile defenses, long-range precision strike capabilities, strategic early warning systems, and military space capabilities.[1362] US policymakers, in turn, viewed these developments as an indication of the aggressive intent of China against the US and planned to invest more than a trillion dollars in modernizing its nuclear force.[1363] Currently, the nuclear modernization plan, according to the 2018 NPR discussed above, includes the development of the nuclear-armed Long-Range Standoff (LRSO) cruise missile and redesigned B61-12 gravity bomb.[1364] Scholars such as Brad Roberts have argued that such "tailored nuclear components" of the US nuclear weapons program are crucial for a "theory of victory" once a nuclear conflict begins with China.[1365]

According to the 2018 NPR, the US might use nuclear weapons first under certain conditions, and US policymakers are worried that a conventional war might escalate to a level where they must use nuclear weapons. On the other hand, China's policymakers believe that no state would welcome nuclear retaliation after resorting to nuclear weapons first. They are concerned that their counterparts in the US might believe in nuclear primacy and that they can escape or prevent nuclear retaliation. And that a favorable nuclear balance of power might lead them to secure what Kroenig calls a "crisis bargaining" advantage.[1366] Hence, for the US, controlling a conventional conflict from low-levels of conventional or nuclear escalation to outright nuclear conflict without inviting a nuclear strike is a dilemma. For China assuring a nuclear retaliation is a

[1362] State Council Information Office, "China's military strategy," *Ministry of Defense*, May 2015, accessed August 16, 2020, http://eng.mod.gov.cn/Database/WhitePapers/index.htm.
[1363] Jon Wolfsthal, Jeffrey Lewis and Marc Quint, *The trillion dollar nuclear triad* (Monterey, Calif.: Center for Nonproliferation Studies, 2014); U.S-China Economic and Security Review Commission (U.S.CC) 2015 Report to Congress of the U.S.- China Economic and Security Review Commission. November 2015, accessed August 13, 2020, http://origin.www.uscc.gov/sites/default/files/annual_reports/2015%20Annual%20Report%20to%20Congress.PDF; also see Office of the Secretary of Defense (OSD), "Annual report to Congress: Military and security developments involving the People's Republic of China." U.S. Department of Defense, April 26, 2016, accessed August 16, 2020, www.defense.gov/Portals/1/Documents/pubs/2016%20China%20Military%20Power%20Report.pdf; Eric Heginbotham, Michael Nixon, Forrest E. Morgan, Jacob L. Heim, Jeff Hagen, Sheng Tao Li, Jeffrey Engstrom, Martin C. Libicki, Paul DeLuca, David A. Shlapak, David R. Frelinger, Burgess Laird, Kyle Brady and Lyle J. Morris, *The U.S.-China Military Scorecard Forces, Geography, and the Evolving Balance of Power, 1996–2017* (Santa Monica, Calif.: RAND Corporation, 2015); Lisbeth Gronlund, Eryn MacDonald, Stephen Young, Philip E. Coyle III and Steve Fetter, "Making Smart Security Choices: The Future of the U.S. Nuclear Weapons Complex," *Union of Concerned Scientists*, March 2014, accessed August 5, 2020, https://www.ucsusa.org/sites/default/files/2019-09/nuclear-weapons-complex-report.pdf.
[1364] "Nuclear Posture Review 2018," x
[1365] Brad Roberts, *The case for U.S. nuclear weapons in the 21st century* (Stanford, CA: Stanford University Press, 2016)
[1366] The Logic of American Superiority, 15-20

predicament, given its low number of nuclear weapons and US precision conventional capabilities. The Chinese policymakers are apprehensive of the US because it can degrade China's retaliatory capability by employing conventional precision strikes to a level where US policymakers might risk and threaten China with nuclear strikes to control or limit conventional war. Out of this fear, China's SMS 2013 vows to acquire the capability to fight and win a conventional war under nuclear conditions.[1367] US policymakers, to restrain China, want to assure that nuclear retaliation is possible, and at the same time, they diminish the possibility that the US will be restrained by the counter nuclear strikes in response to the actual use of nuclear weapons should it be necessary. This is a psychological tug of war between the threat of the use of nuclear weapons and the actual use of nuclear weapons. Therefore, the outcome is spawning an arms race between the US conventional and nuclear capabilities that threaten China, and China's conventional and nuclear capabilities intended to counter US threats.

According to the SMS 2013 and noted previously, China is concerned about US missile defenses, precision strike capabilities, and ISR capabilities, enabling the US to identify and destroy China's nuclear forces with precision strikes and missile defenses that intercept residual weapons. China is progressing several initiatives to neutralize these capabilities by increasing its number of warheads, platforms to deliver them, developing missiles with MIRVing capabilities, anti-satellite weapons, and space-based early warning systems and missile silo fields.[1368] This is probably why the 2018 NPR devised a tactical response to China's emerging strategic capabilities, considering the new low-yield nuclear weapons to increase the credibility of its first use options. According to Roberts, "if a nuclear-armed regional challenger believes that it can engage in nuclear blackmail, nuclear brinksmanship, and potentially even limited nuclear employment to prevail over the United States and its allies, then the United States and its allies must also have a theory of victory."[1369] He further writes that the US policymakers argue that their intimidation of Chinese counterparts may make the Chinese believe that a 'tailored strategy' involves just a few nuclear weapons, and it is not worth China's counter-value retaliation.[1370] This would discourage nuclear escalation.

[1367] *The Science of Military Strategy* (Beijing: Military Science Press, 2013)
[1368] Kristensen and Korda, "Chinese Nuclear Forces, 2021"
[1369] Roberts, *The case for U.S. nuclear weapons*, 96
[1370] Ibid., 254-255

How the US and China militaries fare against each other in cyber-space largely depends on their respective cyber-defense and cyber-offense capabilities and the objectives of both states. The US concerns over cyberattacks and espionage attempts originating from China are multiplying. The 2011 National Counterintelligence Executive report identified China as the "most active and persistent" state carrying out cyber intrusions into the US.[1371] In 2016, the Obama administration released a detailed Cybersecurity National Action Plan; however, the plan did not implicate any state by name.[1372] In contrast, the National Cyber Strategy, released in 2018, notes,

> The [Trump] administration recognizes that the United States is engaged in a continuous competition against strategic adversaries. Russia and China… all use cyberspace as a means to challenge the United States, its allies, and partners, often with a recklessness they would never consider in other domains.[1373]

The 2018 NPR claims that a cyber-attack on the US NC3 facilities would be considered a "non-nuclear strategic attack" of magnitude enough to legitimize the use of nuclear weapons in retaliation.[1374] Bringing cyberwarfare to such a high level of importance indicates that the adversary's cyber capabilities are growing fast, and the US NC3 systems are aging and becoming obsolete. Another indication that supports this is that for the past five years, the US DoD has been exploring the options for proactive cyber-attack capabilities designed to disrupt or destroy enemy missile forces before being launched; a tactic also known as "left of launch."[1375] For China, and other states such as Russia and North Korea, this strategy is a warning that the US DoD is probing for shortcomings and vulnerabilities in their missile launch mechanisms, which may lead it to incorporate more safety measures and policies that are escalatory in nature, such as use-it or lose-it, as discussed earlier.

[1371] Office of the National Counterintelligence Executive, "Foreign Spies Stealing U.S. Economic Secrets in Cyberspace," October 2011, accessed January 23, 2021, http://www.ncix.gov/publications/reports/fecie_all/Foreign_Economic_Collection_2011.pdf.

[1372] Office of the Press Secretary, The White House, "Fact Sheet: Cybersecurity National Action Plan," February 09, 2016, accessed November 20, 2020, https://obamawhitehouse.archives.gov/the-press-office/2016/02/09/fact-sheet-cybersecurity-national-action-plan

[1373] National Cyber Strategy of the United States of America, September 2018, accessed December 12, 2020, https://trumpwhitehouse.archives.gov/wp-content/uploads/2018/09/National-Cyber-Strategy.pdf

[1374] Michael T. Klare, "Cyber Battles, Nuclear Outcomes? Dangerous New Pathways to Escalation," *Arms Control Today*, November 2019, accessed September 30, 2020, https://www.armscontrol.org/act/2019-11/features/cyber-battles-nuclear-outcomes-dangerous-new-pathways-escalation

[1375] Andrew Futter, "The Dangers of Using Cyberattacks to Counter Nuclear Threats," *Arms Control Today*, July/August 2016, accessed September 30, 2020, https://www.armscontrol.org/act/2016-07/features/dangers-using-cyberattacks-counter-nuclear-threats#:~:text=Including%20cyberattacks%20as%20part%20of,under%20attack%2C%20fear%20that%20nuclear

6.7.3 **From Cyber War to Nuclear War**

The connection between nuclear and cyber warfare exists because almost every NC3 system is dependent on networks and computer-based processors for critical operations. From end-to-end, entire chain of command starting from political authority to launch facilities, including C2, radars, early warning system, and space satellites, all networks of communications and analysis are dependent on cyber-space.[1376] Similarly, defensive early warning systems are also based on systems connected through cyber-space. Any disruption at any stage of communication, despite built-in redundancies, could sabotage the entire process, crippling decision-makers from making any substantive decision. For instance, the US and Israel carried out a cyber-attack with the *Stuxnet* virus to disrupt the Iranian nuclear enrichment process in 2010.[1377] Another cyber-attack, presumably by the US, was carried out to "left of launch" North Korea's missile tests in 2017.[1378] More recently, in April 2021, "Israel appeared to confirm claims that it was behind a cyber-attack on Iran's main nuclear facility."[1379] Such demonstration shows that the US (and some of its allies) has the capacity and willingness to carry out cyber-attacks on the nuclear infrastructure of adversaries.

In a crisis, the first use of cyber weapons to disrupt or destroy the NC3 of the adversary could quickly escalate a larger conflict. In the fog of war, a state recipient of a cyber-attack might fear kinetic attacks will follow – an attack that first involves conventional and then nuclear weapons, and under the pressure of losing retaliatory capability, might resort first to nuclear weapons.[1380] Moreover, if convinced that NC3 systems are infected with cyber malware, a state might not trust its systems and try to underplay or overplay risk during a crisis. Such circumstances may also lead to a situation where "uncertainty caused by the unique character of a cyber-threat could jeopardize the credibility of the

[1376] Andrew Futter, *Hacking the Bomb: Cyber Threats and Nuclear Weapons* (Washington: Georgetown University Press, 2018)
[1377] "Stuxnet: Targeting Iran's Nuclear Programme," *Strategic Comments*, Vol. 17, Comment 2, accessed September 30, 2021, https://www.tandfonline.com/doi/pdf/10.1080/13567888.2011.575612
[1378] David E. Sanger, *The Perfect Weapon* (New York: Crown, 2018), 7, 36, 276-283
[1379] Martin Chulov, "Israel appears to confirm it carried out cyberattack on Iran nuclear facility," *The Guardian*, April 11, 2021, accessed September 30, 2021, https://www.theguardian.com/world/2021/apr/11/israel-appears-confirm-cyberattack-iran-nuclear-facility
[1380] James N. Miller Jr. and Richard Fontaine, "A New Era in U.S.-Russian Strategic Stability," Harvard Kennedy School Belfer Center for Science and International Affairs and the Center for a New American Security, September 2017, accessed October 1, 2020, 18, https://s3.amazonaws.com/files.cnas.org/documents/CNASReport-ProjectPathways-Finalb.pdf

nuclear deterrent and undermine strategic stability in ways that advances in nuclear and conventional weapons do not."[1381]

A cyber-attack can lead to an inadvertent, unauthorized, or accidental exchange of nuclear weapons between the US and China. Either state could perceive incoming missiles as a missile carrying nuclear payload. During a conflict, early warning systems or command and controls centers of both states could be tampered with or highjacked, given that each state has anti-satellite weapons and fog of war that could hamper access to real-time information and intelligence. The cyber-attack can trigger false alarms and lead to human errors leading to accidental nuclear war. There are ample examples from the Cold War, such as on November 5, 1956, with false alarms due to technical problems during the Suez Crisis; a false radar alert from Thule, Greenland on October 5, 1960; the false threat of coincidence leaving communication between the US Strategic Air Command and NORAD dead, resulting in US SAC losing communication with three Ballistic Missile Early Warning Sites (BMEWS) on November 24, 1961; a navigational error took a US Bomber in Soviet No-Fly Zone on August 23, 1962; a Soviet submarine captain decided to fire a nuclear torpedo during the Cuban Missile Crisis; a false alarm during the Defense Readiness Conditions-3 (DEFCON-3) on October 24, 1973; the Soviets misinterpretation of the US nuclear war games in November 1983, and a launch facilities down incident of October 2010 when the US Warren Air Force Base lost contact with the 50 Minuteman III ICBMs are all important examples to mention.[1382]

6.8 Implications for Crisis Stability and Escalation

The ongoing nuclear force modernization and development in China and the US could severely affect crisis stability and escalation. To repeat briefly, crisis stability "is a measure of the countries' incentives not to pre-empt in a crisis, that is, not to attack first in order to beat the attack of the enemy."[1383] Structural stability refers to the pre-crisis situation between two powers and the range of factors that can support or undermine crisis stability. This can include the relative geographic positions of the two states, the topography of the terrain between them, the size, composition, and force structures of

[1381] Page O. Stoutland and Samantha Pitts-Kiefer, "Nuclear Weapons in the New Cyber Age: Report of the Cyber-Nuclear Weapons Study Group," *Nuclear Threat Initiative*, September 2018, October 1, 2020, 12, https://media.nti.org/documents/Cyber_report_finalsmall.pdf.
[1382] "Accidental Nuclear War: A Timeline Of Close Calls," *Future of Life Institute*, accessed September 28, 2020, https://futureoflife.org/background/nuclear-close-calls-a-timeline/
[1383] Charles L. Glaser, *Analysing Strategic Nuclear Policy* (Princeton, N.J.: Princeton University Press, 1990), 45

both sides, and their warfighting doctrines and strategies.[1384] Crisis escalation is a condition during a conflict when crisis stability fails and states attempt to manipulate the crisis in their favor and reduce costs and/or severe outcomes.

Though the US and China do not share a land border, there is a US military presence in Guam and Hawaii (less than 10,000km from mainland China) and military bases in South Korea and Japan (stationing more than 80,000 military personnel). Historically, land powers are more likely to wage war against one another when they share a border than powers separated by sea, but in the US-China matrix, the US enjoys an edge over China. The US and China also have an asymmetric force structure, particularly in the nuclear realm. As noted in Chapter Five, for the US, the naval leg of the triad holds primary importance. In contrast, the Chinese land-based ICBM force maintains a primary role in nuclear operations. Several factors contribute to sea-based nuclear deterrence platforms (SSBNs) being able to operate with more impunity than land-based forces, as discussed above in Chapter Five. Moreover, China's doctrinal and nuclear force ambiguity is entirely at odds with the US. The US officially publishes a nuclear posture review every eight years, and its nuclear force modernization plans are available publically. China, however, maintains strict secrecy and has never published or de-classified its past or present nuclear doctrines.

Lastly, the 'interactive' nature of deterrence between the US and China is missing, unlike that the US had with the Soviets, particularly after the Cuban Missile Crisis, which proved effective enough to manage their way through crises.[1385] Although a military hotline between the US and China was established in 1997, it never proved its utility, not even when NATO accidentally bombed the Chinese embassy in Belgrade, two days after the establishment of the hotline in 1999.[1386] Biden's Asia policy chief, Kurt Campbell, in an interview stated,

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[1384] Robert Axelrod, "The Concept of Stability in the Context of Conventional War in Europe," *Journal of Peace Research*, Vol. 27, No. 3 (1990), 247-254; Robert J. Powell, "Crisis Stability in the Nuclear Age," *American Political Science Review*, Vol. 83, No. 1(1989), 61-76; Thomas C. Schelling, *Arms and Influence* (New Haven, Conn.: Yale University Press, 1966) 244–245; Laurence S. Seidman, "Crisis Stability," *Journal of Conflict Resolution*, Vol. 34, No. 1, March 1990; Stephen van Evera, "Offense, Defense, and the Causes of War," *International Security*, Vol. 22, No. 4, (1998) 6

[1385] Daryl Kimball, "Hotline Agreements," *Arms Control Association*, May 2020, accessed January 27, 2022, https://www.armscontrol.org/factsheets/Hotlines

[1386] Julian Borger, "Hotlines 'ring out': China's Military Crisis Strategy needs rethink, says Biden's Asia chief, *The Guardian*, May 6, 2021, accessed January 28, 2022, https://www.theguardian.com/world/2021/may/06/hotlines-ring-out-chinas-military-crisis-strategy-needs-rethink-says-biden-asia-chief-kurt-campbell

> China has generally resisted any effective efforts…of confidence-building, crisis management procedures. In the past, the hotlines that have been set up have just rung, kind of endlessly in empty rooms. So the Chinese have chosen not to go in that direction. At the same time that they are ramping up these military activities in proximity to US and allied forces, they've done so without any kind of guardrails or reassurance mechanisms.[1387]

In such circumstances, US-China mutual deterrence is falling into the abyss of uncertainty, as communication, one of the other two critical parts of deterrence, i.e., capability and credibility, is missing.[1388] These differences and disconnections show that there exists a reasonable concern that US-China structural stability is not strong or, at the least, is being undermined.

China's nuclear force modernization has already influenced US nuclear modernization efforts. The change in policy demands change in capability from each side in a spiral of change and counter-change. There is a lack of US-China nuclear weapon arms control arrangements and nuclear Confidence Building Measures (CBMs) and this involves security dilemmas that generate perpetual struggle for power, influence, and the arms race. Some may argue that both sides are enacting changes to re-establish or ensure mutual deterrence in response to the other side's changes, creating greater stability (albeit with progressively-more technologically advanced forces). However, US policymakers, while responding to strategic developments of China, are introducing sub-strategic or low-yield options. Doing this, in the absence of arms control arrangements and CBMs, reflects that the US is in the process of acquiring a capability that could be used to fight and win a regional/limited nuclear war. In contrast, China's recent nuclear efforts, especially its SSBNs developments, strategic bombers, and long-range strategic missiles, show China's strategic thinking centers have broadened out to identify a need to be able to threaten the continental US. The US response to China's nuclear weapons policy and force modernization is regional and tactical, trying to offset China's A2/AD strategy in China in East and South China by lowering the tactical level nuclear threshold. All these apparently defensive measures are negatively impacting strategic stability between the US and China.

Additionally, although China is committed to the NFU pledge at the declaratory level, Washington's BMD systems and quest to seek conventional precision strike capabilities

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[1387] Ibid

[1388] Paul Haenle, "Why the U.S. and Chinese Militaries Aren't Talking Much Anymore," *CEIP*, August 11, 2021, accessed January 28, 2022, https://carnegieendowment.org/2021/08/11/why-u.s.-and-chinese-militaries-aren-t-talking-much-anymore-pub-85123

complicate China's defense requirement and could compel China to give up NFU for options such as launch on warning. China's force modernization, specifically the precision-guided cruise and ballistic missile developments, significantly affects crisis instability and escalation.[1389] According to one RAND study, China would be likely to resort to massive and sudden missile strikes against the US airbases and military installations in the Indo-Pacific to disrupt US and allied forces in the case of war. Such attacks against US capabilities could generate escalatory conventional pre-emption strikes against China's missile forces.[1390] What further exacerbates and complicates the situation is China's comingling of its missile forces. The PLARF of China controls both conventional and nuclear missiles.[1391] Therefore, a strike on China's missile forces or command and control centers to eliminate or disrupt its conventional forces may inadvertently lead to disruption and elimination of its nuclear command and control systems and nuclear forces. Such a strike would place pressure on China's strategic decision-makers, shortening their time to deliberate and even seek clarification with their adversary over the nature and extent of the attacks because of inoperable interactive deterrence, compelling them to use nuclear weapons before losing them to adversarial strikes.

Additionally, while China's dispersal of mobile launchers should be stabilizing, it will further complicate the US's ability to distinguish between conventional and nuclear missiles during a conflict that may also draw a massive attack from the US to limit the damage, which will be inherently escalatory should it fail to sufficiently eliminate Beijing's nuclear forces.

China's modernization and deployment of sea-based nuclear deterrent force is another possible source of crisis instability and escalation. China's SLBMs now make up approximately half of the total ballistic missiles in its arsenal that could reach the US.[1392] With SSBNs comes new command and control challenges. Currently, it is not clear, but if China plans to implement continuous at-sea deterrence (CASD) patrols, it would be

[1389] Heginbotham et al., *China's Evolving Nuclear Deterrent*, 158
[1390] Ibid, 158-159; Barry R. Posen, :Inadvertent Nuclear War? Escalation and NATO's Northern Flank,: *International Security*, Vol. 7, No. 2, (1982); Barry R. Posen, *Inadvertent Escalation: Conventional War and Nuclear Risks* (Ithaca, N.Y.: Cornell University Press, 1991); Forrest E. Morgan, Karl P. Mueller, Evan S. Medeiros, Kevin L. Pollpeter, and Roger Cliff, *Dangerous Thresholds: Managing Escalation in the 21st Century*, (Santa Monica, Calif.: RAND, 2008)
[1391] "China Power, How Are China's Land-based Conventional Missile Forces Evolving?" *China Power*, September 21, 2020, updated December 15, 2020, accessed February 23, 2021, https://chinapower.csis.org/conventional-missiles/
[1392] "Nuclear Notebook: Chinese nuclear forces, 2021"

significant to its nuclear posture as China has centralized nuclear authority for its land-based missile force.[1393] SSBNs with nuclear weapons on board for CASD would require a delegation of nuclear-use authority to commanders on their submarines – a practice that the US and Russia appear to have mastered under the intense pressure during the Cold War.[1394] Such a move might be viewed as China's departure from its long-standing NFU and efforts to reduce the existing strategic imbalance vis-a-vis the US.

Additionally, due to the increased survivability of SSBNs, US decision-makers might be under enormous pressure to take out Chinese SSBNs in the initial stages of a conflict, and the US may have the relative technological prowess to do so.[1395] China's SSBNs route to open seas passes through the South China Sea or the Yellow Sea water channels adjacent to territories of US allies.[1396] This terrain topography appears to be one of the other factors discussed above affecting structural stability. Moreover, these water channels are thoroughly observed by the joint anti-submarine warfare platforms of the US, Japan, Australia, Taiwan, and the Philippines.[1397] The US and Japan have been modernizing underwater surveillance and reconnaissance systems installed during the Cold War.[1398] This gives the US and allies a technological advantage over China, making it hard for China's relatively noisy submarines to transit into the Pacific without being detected. China's next-generation Type-096 SSBNs would be less noisy. They would become operational somewhere around 2030, the US and its allies would have more advanced ASW capabilities by then. And it remains that China's submarines have to

[1393] Tong Zhao, "China's Sea-Based Nuclear Deterrent," June 30, 2016, accessed September 21, 2020, https://carnegietsinghua.org/2016/06/30/china-s-sea-based-nuclear-deterrent-pub-63909
[1394] Ibid
[1395] "Even with multiple layers of sensors—hydrophones on the ocean floor (especially at chokepoints leading to the Pacific), manned and unmanned patrol aircraft, surface and undersea warships equipped with appropriate gear, and low-earth-orbit satellites designed for precise ocean reconnaissance, which they are not today, the Chinese Navy would still face a daunting task in trying to find Virginia-class subs." Loren Thompson, "How China Will Try To Unmask U.S. Submarines In The Western Pacific," *Forbes*, June 22, 2021, accessed October 1, 2021, https://www.forbes.com/sites/lorenthompson/2021/06/22/how-china-will-try-to-unmask-us-submarines-in-the-western-pacific/?sh=1c6bc57c558a
[1396] "China sails through 'First Island Chain'," *China Daily*, August 02, 2013, accessed September 23, 2020, http://en.people.cn/90786/8350100.html
[1397] Zhao, "China's Sea-based Nuclear Deterrent"; Jamie Seidel, "Australia faces 'potential military crisis' with China over Taiwan within years," *News*, May 4, 2021, accessed January 28, 2022, https://www.news.com.au/technology/innovation/military/australia-faces-potential-military-crisis-with-china-over-taiwan-within-years/news-story/4550379869f38c7de6da69facb3717da; Euan Graham, "Australia's serious strategic update," *IISS*, July 3, 2020, accessed January 28, 2022, https://www.iiss.org/blogs/analysis/2020/07/apacific-australia-defence-update
[1398] Desmond Ball and Richard Tanter, *The Tools of Owatatsumi: Japan's Ocean Surveillance and Coastal Defense Capabilities* (Canberra: Australian National University Press, 2015); Also see Lyle J. Goldstein and Shannon Knight, "Wired for Sound in the 'Near Seas,'" *U.S. Naval Institute*, Vol. 140, No. 4, (2014), 56-61; Owen R. Cote, *Assessing the Undersea Balance Between the U.S. and China* (Cambridge, MA: Massachusetts Institute of Technology, 2011).

transit through shallow water to get to deep water, and therefore these chokepoints could make them vulnerable to adversary ASW platforms.[1399]

Since China considers and relies heavily on SSBNs to evade US BMD systems and target the continental US, in the event of the destruction of a few SSBNs, this could push China into a use-it or a lose-it situation, forcing China to employ nuclear weapons. Such an event would escalate the conflict to a position where damage limitation and/or intra-war deterrence might not be feasible.

6.9 Implications for US Nuclear Extended Deterrence

The modernization, expansion, and diversification of China's nuclear forces and platforms present a severe challenge to US extended deterrence credibility. If China is still left with enough nuclear capability to strike inside the US after an attempt by the US to decapitate China's nuclear capabilities, allies such as Japan and South Korea could question whether the US nuclear threat to China on their behalf is credible. In other words, would the US risk some kind of nuclear attack on the continental US for the sake of its allies? It is a perennial question that has existed since the US started providing extended deterrence. For example, despite being part of the NATO and under the US 'nuclear umbrella', France still felt compelled to seek its own nuclear deterrent.[1400]

As discussed in Chapter Five, China has attained a nuclear capability capable of targeting and striking the US. Policymakers in the US must assume that China has some level of deterrence capability (ICBMs and SLBMs). However, it may not be sufficient to establish a reliable MAD relationship with the US; or the US may reject the desirability of 'agreeing' to establish a MAD relationship, compelling ever-more intense developments in the US nuclear arsenal to try undermine China's deterrent. Some view that the increased vulnerability of the US to China may not diminish its extended deterrence credibility as, in the past, Japan has believed in the US extended deterrence provided against the Soviet Union based upon the US-Soviet Union/Russia mutual deterrence

[1399] Ken Moriyasu, "US Eyes using Japan's Submarines to 'choke' Chinese Navy," *Nikkei Asia*, May 5, 2021, accessed January 28, 2022, https://asia.nikkei.com/Politics/International-relations/Indo-Pacific/US-eyes-using-Japan-s-submarines-to-choke-Chinese-navy

[1400] Frederic Joliot-Curie, Irene Joliot-Curie, Lew Kowarski and Hans Halban, "French Nuclear Program," *Atomic Heritage Foundation*, February 4, 2017, accessed January 28, 2022, https://www.atomicheritage.org/history/french-nuclear-program; "Fact Sheet: France's Nuclear Inventory," *Center for Arms Control and Non-Proliferation*, March 27, 2020, accessed January 28, 2022, https://armscontrolcenter.org/fact-sheet-frances-nuclear-arsenal/

balance and MAD (discussed in detail in the next chapter).[1401] Having a historical precedent does not guarantee that Japan will act in the same way. As discussed in the next chapter, Japan is expanding its military budget, acquiring new military capabilities, and slowly moving away from its post-WWII constitutional constraints, suggesting that Japan's approach to nuclear weapons could change. However, President Trump's remarks that Japan and South Korea were 'free-riders' who do not pull their own weight raised questions about the Trump administration's willingness to defend allies, which is also discussed in detail in the next chapter.[1402]

The 2018 NPR, while emphasizing the value of the US nuclear capabilities, notes, "conventional forces alone are inadequate to assure many allies who rightly place enormous value on U.S. extended nuclear deterrence."[1403] This reflects that US nuclear capabilities contribute significantly to deterrence against both "nuclear and non-nuclear aggression."[1404] As such, China's decision-makers might be willing to run a high level of risk at the conventional level even while operating in areas against states over which the US has extended their nuclear umbrella. This is the fundamental premise of the stability-instability paradox; the concept that relative stability between states at the nuclear level may lead to less stability at the conventional level because of the enormous risks involved if one were to try to repulse a conventional attack from the other (the risk being potential escalation to nuclear war).[1405] States may feel free to 'salami slice' small portions of territory in a situation of mutual deterrence that, in turn, would aggregate into major gains; or to do it vis-à-vis US allies who may feel the US would not risk nuclear war to defend them. China is still pursuing salami tactics to secure its security interests in the adjacent regions by building artificial islands and militarizing them, increasing violations of Taiwan ADIZ and territorial boundaries by deploying carrier force, intruding into Japan's

[1401] Yukio Satoh, "U.S. Extended Deterrence and Japan's Security, Livermore Papers on Global Security No. 2," *Center for Global Security Research,* October 2017, accessed September 23, 2020, https://cgsr.llnl.gov/content/assets/docs/satoh-report-final.pdf

[1402] Bruce Klingner, Jung H. Pak, and Sue Mi Terry, "Trump shakedowns are threatening two key US alliances in Asia," *Brooking,* December 18, 2019, accessed June 1, 2021, https://www.brookings.edu/blog/order-from-chaos/2019/12/18/trump-shakedowns-are-threatening-two-key-u-s-alliances-in-asia/

[1403] "Nuclear Posture Review Report 2018," vi-vii

[1404] Ibid

[1405] Michael Krepon, *The Stability-Instability Paradox, Misperception, and Escalation Control in South Asia*, (Washington, D.C.: Stimson Center, 2003); "Thomas J. Christensen, The Meaning of the Nuclear Evolution: China's Strategic Modernization and US-China Security Relations," *Journal of Strategic Studies*, Vol. 35, No. 4, (2012).

territorial water, and violating the Philippines' exclusive economic zones.[1406] According to some scholars, as China's conventional warfighting capabilities are improving rapidly, their ability to impose significant damage to the US in a limited conventional conflict is increasing.[1407] Such a change might also be observed in the nuclear domain. Thus, the escalation of conventional war to the nuclear level for damage limitation (intra-war deterrence) or escalation control may also become a viable option for China's decision-makers as their conventional military capability improves.

6.10 Conclusion

China's ongoing nuclear force modernization, driven by external and internal factors identified by neoclassical realism, started under Xi and entails policy changes and force modernization and expansion. It has severe and far-reaching implications for international security. China's force modernization has affected the US nuclear deterrence, crisis stability and escalation, and challenged the US extended nuclear deterrence guarantees. In reaction to China's nuclear force modernization, which threatens US power, influence, and the US-led security architecture in the Indo-Pacific, the US introduced a significant change in its nuclear weapons program. Although the plans for revamping the nuclear infrastructure in the US began during the Obama administration, the Trump administration initiated plans for new nuclear force modernization put forward in the 2018 Nuclear Posture Review. It called for and enacted the development of new low-yield nuclear weapons, a submarine-launch ballistic missile (SLBM) capable of carrying a low-yield nuclear weapon, a new nuclear role for the F-35, and long-range stand-off weapons (nuclear-armed air-launched cruise missile). The 2018 NPR rhetorically rejects nuclear warfighting. However, the new capabilities outlined by the Trump administration suggest the US is pursuing a nuclear warfighting strategy or at least is 'hedging' in case the US needs to operationalize one in future years if the US-China competition deteriorates even further. Once operational, these newly introduced capabilities would maximize the US' ability to fight a limited (regional) nuclear war and allow the US to escalate to a higher

[1406] Tobias Burgers and Scott Romaniuk, "Is China Done With Salami Slicing?" *The Diplomat*, May 01, 2021, accessed January 28, 2022, https://thediplomat.com/2021/04/is-china-done-with-salami-slicing/
[1407] Eric Heginbotham, Michael Nixon, Forrest E. Morgan, Jacob L. Heim, Jeff Hagen, Sheng Li, Jeffrey Engstrom, Martin C. Libicki, Paul DeLuca, David A. Shlapak, David R. Frelinger, Burgess Laird, Kyle Brady, and Lyle J. Morris, *The U.S.- China Military Scorecard: Forces, Geography, and the Evolving Balance of Power, 1996–2017* (Santa Monica, Calif.: RAND Corporation, 2015)

level - a level wherein it maintains military nuclear advantage above and beyond a secure second-strike capability.

China, particularly after Xi became president, is improving and upgrading its nuclear inventory, including ICBMs with MIRVing capability, SSBNs with SLBMs and SLCMs, and strategic bombers. These capabilities seek to serve the objective of improving its ability to fight a conventional war under nuclear conditions. China may also seek to lower the nuclear threshold by adopting a launch-on-warning posture; it also seems to be hedging the future direction of its policy, and giving itself more options to allow itself to hedge is prudent in an anarchic system in which it is engaged in an intense competition with the existing global superpower, the US.

China has comingled its conventional and nuclear missile forces, increasing crisis instability, and potentially generating a stability-instability paradox. New SSBN with CASD patrols, should it emerge, will make China's second-strike capabilities more credible. A secure second-strike capability will increase China's confidence and give it leverage to plan for crisis escalation and control strategies during a war. These developments further aggravate the US-China security dilemma, which involves regional allies of US, who may question the US's regional security commitments. Consideration of this topic continues into the next chapter, which examines the implications of China's emerging nuclear force modernization for the regional security and stability of Japan and South Korea.

Chapter Seven

China Nuclear Weapons Policy and Force Modernization: Implications for Japan and South Korea

7.1 Introduction

World politics is in flux, and the global geopolitical shift in power that existed before the beginning of China's nuclear force modernization is continuing, and the competition between China and the rest in the emerging Indo-Pacific region is ongoing. This region is at the convergence of the Indian and Pacific Oceans, which connects via Southeast Asia. The term Indo-Pacific has a political connotation, and is, therefore, value-laden. The US sees the region as the "Free and Open Indo-Pacific" to, in essence, contain China's rise and try to shape the options open to it. This reflects the growing rivalry between the US and China, whereas China views it as a US-led regional arrangement for China's containment.[1408] 'Free and open,' to China, is simply rhetorical window-dressing by the US to legitimize its realpolitik in the region.

China's ongoing nuclear weapons force modernization, driven by changes in the external security environment and internal factors as per the neoclassical realist framework, is a cause of concern for its neighboring states in the Indo-Pacific region. Due to its growing power, and the more assertive behavior of China, a spiral pattern of action-reaction is underway. According to the recent Stockholm International Peace Research Institute (SIPRI) report, from 2010-2020, China's defense expenditure increased by a total of 85 percent, while the US defense spending declined by 15 percent over this period.[1409] Whereas Japan's defense expenditure has increased by just 4.7 percent over the same period, and Taiwan's defense expenditure decreased by 5.53 percent. India and South

[1408] Felix Heiduk and Gudrun Wacker, "From Asia-Pacific to Indo-Pacific Significance, Implementation and Challenges," *German Institute for International and Security Affairs*, July 2020, accessed December 19, 2020, https://www.swp-berlin.org/fileadmin/contents/products/research_papers/2020RP09_IndoPacific.pdf

[1409] "Military expenditure by country, in constant (2018) US$ m., 1988-2020" (see below for 1999-2009) accessed December 19, 2020, https://www.sipri.org/sites/default/files/Data%20for%20all%20countries%20from%201988%E2%80%932019%20in%20constant%20%282018%29%20USD.pdf

Korea have significantly increased their budgets by 38.2 and 30.3 percent, respectively, from 2010 to 2020.[1410]

The previous chapter, which presented the second part of the research findings, focused on the implications of China's nuclear force modernization for the US from an international security point of view. This chapter and the next chapter, which are related to the third part of the research findings, examine the implications of China's nuclear force modernization for the Indo-Pacific region that includes Japan, South Korea, India, and Taiwan – all states that are concerned over China's rise and its recent assertive/revisionist behavior. The reason for examining these states is that they either possess nuclear weapons or are under US extended nuclear deterrence guarantees (except Taiwan, which has unique security relations with the US, discussed in Chapter Eight), making them part of the regional nuclear order. As such, any major development in the nuclear realm has direct implications for these states. These states also view China as a source of threat and share the US as a common provider of extended deterrence in their respective alliances against China. This chapter focuses on two case studies, South Korea and Japan, through the prism of alliance politics vis-a-vis the US. The chapter explores how China's nuclear modernization is negatively affecting each state's security and how their responses generate a vicious cycle of the security dilemma and multilemma, undermining the security of both states and generating arms race dynamics.

The chapter begins with a brief historical outline of China's disputes with its neighboring states. Subsequently, the chapter uses an alliance politics framework (South Korea-US versus China' and Japan-US versus China) to examine both case studies separately to better understand China's emerging nuclear weapons program's implications for them. The chapter concludes that China's emerging nuclear weapons program has strategic implications for Japan and South Korea, destabilizing the region and it is counter-productive for China's security because of the inherent logic of the security dilemma: efforts to improve the security of one state creates insecurity for others. Moreover, US extended nuclear deterrence to the allies to improve their security military realm generates insecurity for others, who respond in kind and, in the end, their aggregate defensive

[1410] From a regional perspective, is it interesting to note that Japan, which is a long-established ally of the US, has increased its defense budget modestly over a decade; however, relatively new allies such as India and allies are re-aligning their policies with the US and those such as South Korea are significantly increasing their defense spending. Ibid

action-reactions undermine the security of all states involved and make the strategic environment conducive to an arms race.

7.2 China's Territorial Disputes in Context

Since its creation in 1949, China has resorted to the use of force both directly and indirectly in different territorial disputes. Some of these disputes have turned into a war, such as border conflicts with India in 1962 and Vietnam in 1979.[1411] In 1969, China and Russia, involved in a territorial dispute, were also on the verge of nuclear war.[1412] However, China has maritime territorial disputes with Taiwan, the Philippines, Indonesia, Vietnam, Malaysia, Japan, South Korea, North Korea, Singapore, and Brunei.[1413] It also has border disputes with India, Nepal, Bhutan, Laos, Mongolia, Myanmar, and Tibet.[1414]

The East China Sea (ECS) has an abundance of natural resources. It is rich in natural gas, oil, and hydrocarbons.[1415] Both China and Japan have overlapping claims to the continental shelves and the exclusive economic zones (EEZs) in the ECS, apart from claims on the Senkaku Islands (or Diaoyu Islands) and the Ryukyu Islands.[1416] Japan formally claimed these islands in 1895. However, China began to claim these islands in the 1970s, based on the argument that China had historical rights to the area. The dispute exists because of the sea's economic significance, the islands have potential oil and natural gas reserves, are located near main shipping routes, and are surrounded by rich fishing areas.[1417]

[1411] Neville Maxwell, "Sino-Indian Border Dispute Reconsidered," *Economic and Political Weekly*, Vol. 34, No. 15 (1999), 905-918; Alastair Lamb, *Incomplete Partition: The Genesis of the Kashmir Dispute 1947-1948* (Roxford Books, Hertingfordbury, 1997), 2; Daniel Tretiak, "China's Vietnam War and Its Consequences," *The China Quarterly*, No. 80 (1979), 740-767

[1412] Michael S. Gerson, "The Sino-Soviet Border Conflict: Deterrence, Escalation, and the Threat of Nuclear War in 1969," *Center for Naval Analyses*, November 2010, accessed January 29, 2022, https://www.cna.org/cna_files/pdf/d0022974.a2.pdf

[1413] Pia Krishnankutty, Not just India, Tibet: China has 17 Territorial Disputes with Its Neighbors, on land & Sea, *The Print*, July 15, 2020, accessed January 29, 2022, https://theprint.in/theprint-essential/not-just-india-tibet-china-has-17-territorial-disputes-with-its-neighbours-on-land-sea/461115/; Robert Burton-Bradley, "How China handles Border Disputes with neighbors India, Taiwan, Japan and others," *ABC News*, March 9, 2019, accessed January 29, 2022, https://www.abc.net.au/news/2019-03-09/war-deals-and-threats-how-china-handles-border-disputes/10856974

[1414] Ibid

[1415] "Territorial Disputes in the South China Sea," *CFR*, Last updated January 28, 2022, accessed January 29, 2022, https://www.cfr.org/global-conflict-tracker/conflict/territorial-disputes-south-china-sea

[1416] William Choon, "China and Japan's Island Dispute," *The Interpreter*, June 4, 2020, accessed January 29, 2022, https://www.lowyinstitute.org/the-interpreter/china-and-japan-island-dispute; "Tensions in the East China Sea," *CFR*, Last updated January 28, 2022, accessed January 29, 2022, https://www.cfr.org/global-conflict-tracker/conflict/tensions-east-china-sea

[1417] Ibid

China maintains a claim on the continental shelf that goes beyond the equidistant line to the Okinawa Trench. However, Japan claims that an equidistant line, from the states party to the conflict, should separate the EEZs.[1418]

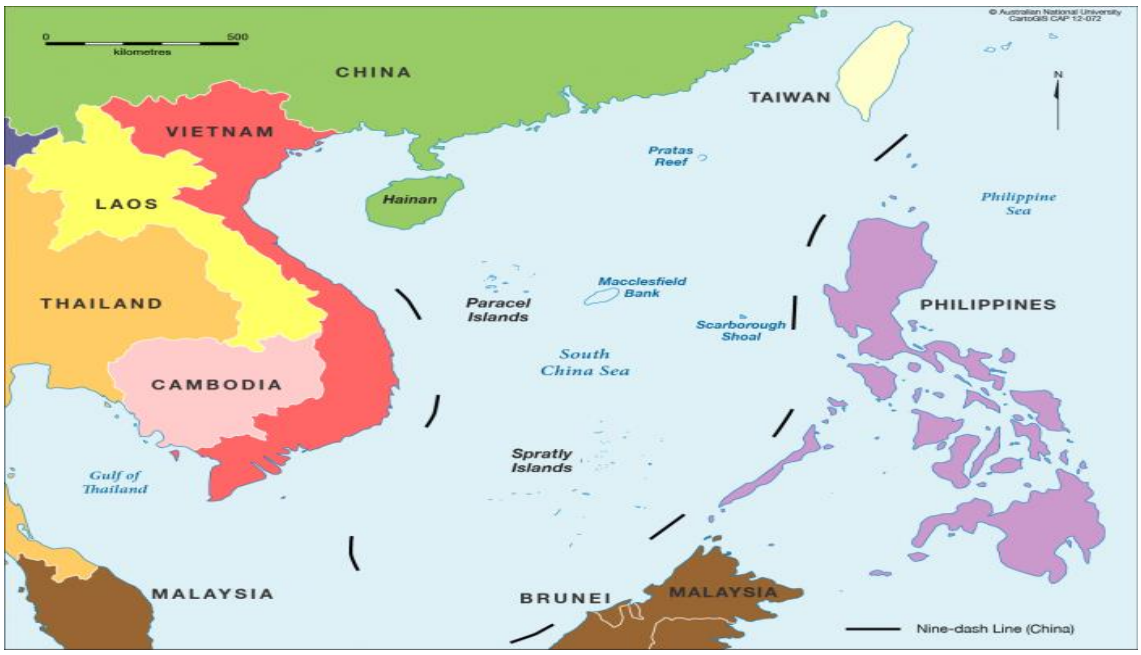
The strategic importance of the South China Sea (SCS) is obvious, and it is currently one of the most contested regions in the world. The SCS has proven oil reserves of approximately 7.7 billion barrels and an estimated 28 billion barrels in total.[1419] China's total crude oil imports were 3.6 billion in 2021.[1420] The SCS also has an estimated 266 trillion cubic feet of natural gas reserves, whereas China imported 12.1 billion cubic feet in 2021.[1421] Based on the average current oil consumption, the proven and estimated oil reserves can meet China's oil needs for almost a decade, and natural gas can meet requirements for almost two decades.

Additionally, according to some estimates, one-third of the world's shipping passes through the South China Sea, carrying more than $3.4 trillion in trade annually, making it the second busiest sea-lane of communication (SLC) globally.[1422] The SCS is also a route for nearly 40 percent of China's trade, and 90 percent of the oil imported to China, Japan, South Korea, and Taiwan.[1423] Additionally, India carries out approximately $200 billion worth of trade through the SCS.[1424]

In the SCS, China has claims over the sovereignty of the Spratly and Paracel Islands, which come within the 'nine-dash line' and cover almost 90 percent of the South China Sea. The claim extends outwards of 2,000km from the Chinese border to a few hundred

[1418] Ankita Sen, "South China Sea: Beijing has a major natural advantage in the geopolitical power game," *The Economic Times*, June 17, 2020, accessed September 5, 2020, https://economictimes.indiatimes.com/news/defence/south-china-sea-beijing-has-a-major-natural-advantage-in-the-geopolitical-power-game/articleshow/76423659.cms?from=mdr
[1419] Zhou, "CHINA DATA: Crude imports rise 20% on year to 10.9 mil b/d in December," *S&P Global*, January 14, 2022, accessed January 30, 2022, https://www.spglobal.com/platts/en/market-insights/latest-news/oil/011422-china-data-crude-imports-rise-20-on-year-to-109-mil-bd-in-december
[1420] Sen, "South China Sea: Beijing has a Major Natural Advantage"
[1421] Dawn Lee, "China's Gas Imports Outpace Domestic Gas Production," *Energy Intelligence*, January 18, 2022, accessed January 29, 2022, https://www.energyintel.com/0000017e-6dd2-d79e-a57e-6fd797aa0000; Ibid
[1422] Marvin Ott, "The South China Sea in Strategic Terms," *Wilson Center*, May 14, 2019, accessed January 29, 2022, https://www.wilsoncenter.org/blog-post/the-south-china-sea-strategic-terms; Office of the Secretary of Defense, Annual Report to Congress 2020, 9
[1423] Ibid
[1424] Ibid

kilometers close to the contestant states, the Philippines, Taiwan, Vietnam, Malaysia, Indonesia, and Brunei.[1425]



Source: CartoGIS Services, College of Asia and the Pacific, The Australian National University

Figure 9: South China Sea (Nine-Dash Line)[1426]

Related to its geo-economic importance, the SCS has geostrategic importance.[1427] Since 2013, China has been building artificial islands in the South China Sea on the Paracel and Spratly island chains and militarizing them.[1428] It has built runways and dozens of hangars for PLAAF and deployed missile defense shields, anti-aircraft batteries, and anti-ship cruise missiles.[1429]

China wants to secure the SLCs for energy imports and trade, for its natural resources, and to ensure the US and its allies cannot 'blockade' the Chinese coast during a crisis or

[1425] Liu Zhen, "What's China's 'nine-dash line' and why has it created so much tension in the South China Sea?", *SCMP*, July 12, 2016, accessed September 6, 2020, https://www.scmp.com/news/china/diplomacy-defence/article/1988596/whats-chinas-nine-dash-line-and-why-has-it-created-so
[1426] CartoGIS Services, College of Asia and the Pacific, The Australian National University
[1427] Sen, "South China Sea: Beijing has a Major Natural Advantage"
[1428] Matthew Southerland, China's Island Building in the South China Sea: Damage to the Marine Environment, Implications, and International Law, *U.S.-China Economic and Security Review Commission*, April 12, 2016, accessed January 29, 2022, https://www.uscc.gov/sites/default/files/Research/China%27s%20Island%20Building%20in%20the%20South%20China%20Sea_0.pdf
[1429] Capt. David Geaney, China's island fortifications are a challenge to international norms, *Defense News*, April 17, 2020, accessed September 7, 2020, https://www.defensenews.com/opinion/commentary/2020/04/17/chinas-island-fortifications-are-a-challenge-to-international-norms/

conflict, given this would strangle China economically.[1430] In a crisis or war, with ready air forces and other deployments, these islands could be used as forwarding bases to limit incursions and push adversaries out of the South China Sea. For Taiwan, China's ability to project military power further outwards from its shores through its SCS militarization is a threat to its existence, as they mitigate the essence of the US deterrent provided against an attempt by China at unifying Taiwan by force, discussed in the next chapter. Moreover, the South China Sea could provide China with a relative sanctuary for its SSBNs and thus a credible second-strike capability and anti-access area denial strategy.[1431] All these developments have significant implications for the Indo-Pacific region, particularly for Japan and South Korea, the regional powers, and the US allies in the region. The following section will focus on the implications of China's nuclear force modernization for Japan.

7.3 Nuclear China and its Implications for Japan

Japan is also gradually increasing its defense spending, but it is now far behind China's expenditure. The Japanese government approved $48.1 billion for 2020 and $49.1 billion for the fiscal year 2021.[1432] The table below shows the comparison between China's and Japan's defense spending over two decades. It shows that China's defense spending was lower than Japan's in 2000; however, in only two decades, by 2020, China's defense spending was five times that of Japan.

[1430] Southerland, "China's Island Building in the South China Sea"
[1431] China Power Team. "Does China Have an Effective Sea-based Nuclear Deterrent?" *China Power*. December 28, 2015. Updated August 26, 2020. Accessed December 23, 2020. https://chinapower.csis.org/ssbn/; Benjamin Schreer, *Asia Policy*, China's Development of a More Secure Nuclear Second-Strike Capability: Implications for Chinese Behavior and U.S. Extended Deterrence, accessed November 28, 2020, https://www-proquest-com.ezproxy.waikato.ac.nz/docview/1687830851?OpenUrlRefId=info:xri/sid:primo&accountid=17287; Also see US Department of Defense, "Annual Report to Congress: Military and Security Developments Involving the People's Republic of China 2015," https://fas.org/man/eprint/dod-china-2015.pdf; and US Department of Defense, "Annual Report to Congress: Military and Security Developments Involving the People's Republic of China 2019," https://media.defense.gov/2019/May/02/2002127082/-1/-1/1/2019_CHINA_MILITARY_POWER_REPORT.pdf; Riyaz Ul Khaliq, "'3 reasons' China tries to control South China Sea," *Anadolu Agency*, February 25, 2021, accessed January 29, 2022, https://www.aa.com.tr/en/asia-pacific/3-reasons-china-tries-to-control-south-china-sea/2157110
[1432] "Military expenditure by country, in constant (2019) US$ m., 1988-2020" *SIPRI* 2021, accessed October 5, 2021, https://sipri.org/sites/default/files/Data%20for%20all%20countries%20from%201988%E2%80%932020%20in%20constant%20%282019%29%20USD%20%28pdf%29.pdf

Table 17**.** China vs. Japan Defense Expenditure[1433]

China vs. Japan Defense Expenditure					
States	**2000 ($US B.)**	**2005 ($US B.)**	**2010 ($US B.)**	**2015 ($US B.)**	**2020 ($US B.)**
China	43.07	79.91	143.93	213.52	244.93
Japan	45.43	46.25	45.62	46.78	48.16

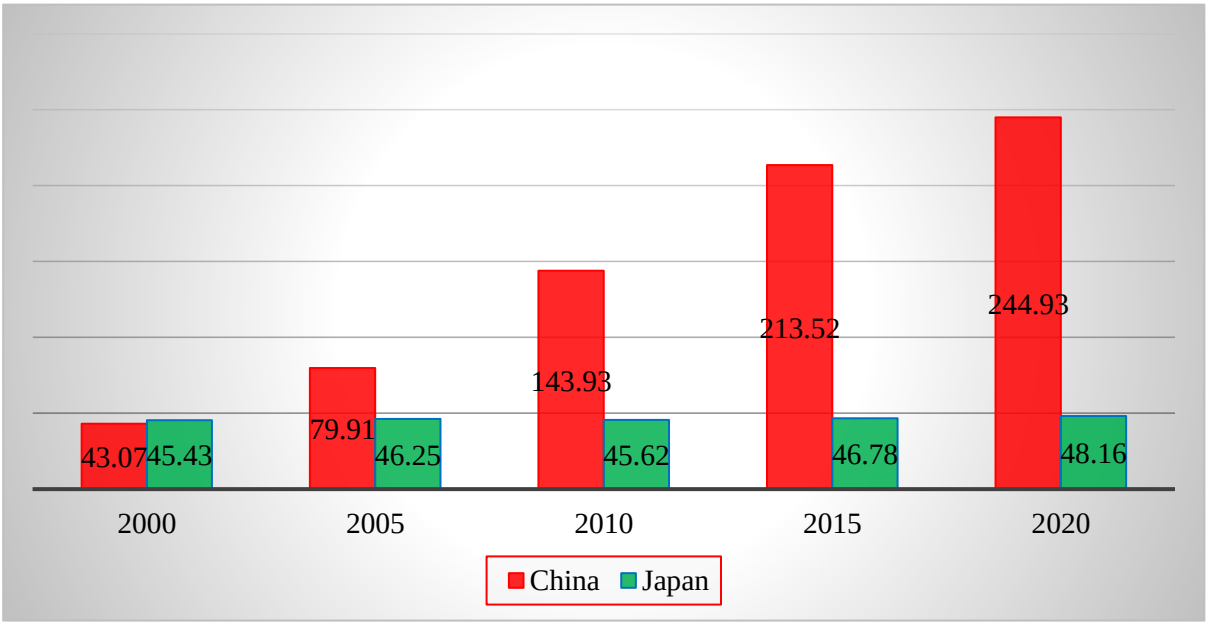


Figure 10: China vs. Japan defense expenditure ($US Billion) SIPRI

Although the percentage of China's defense expenditure is more or less the same as Japan, the growing GDP of China has multiplied its defense budget many times.[1434]

[1433] Ibid
[1434] "Military expenditure by country as percentage of gross domestic product, 1988-2020" © SIPRI 2021, accessed October 7, 2021, https://sipri.org/sites/default/files/Data%20for%20all%20countries%20from%201988%E2%80%932020%20as%20a%20share%20of%20GDP%20%28pdf%29.pdf

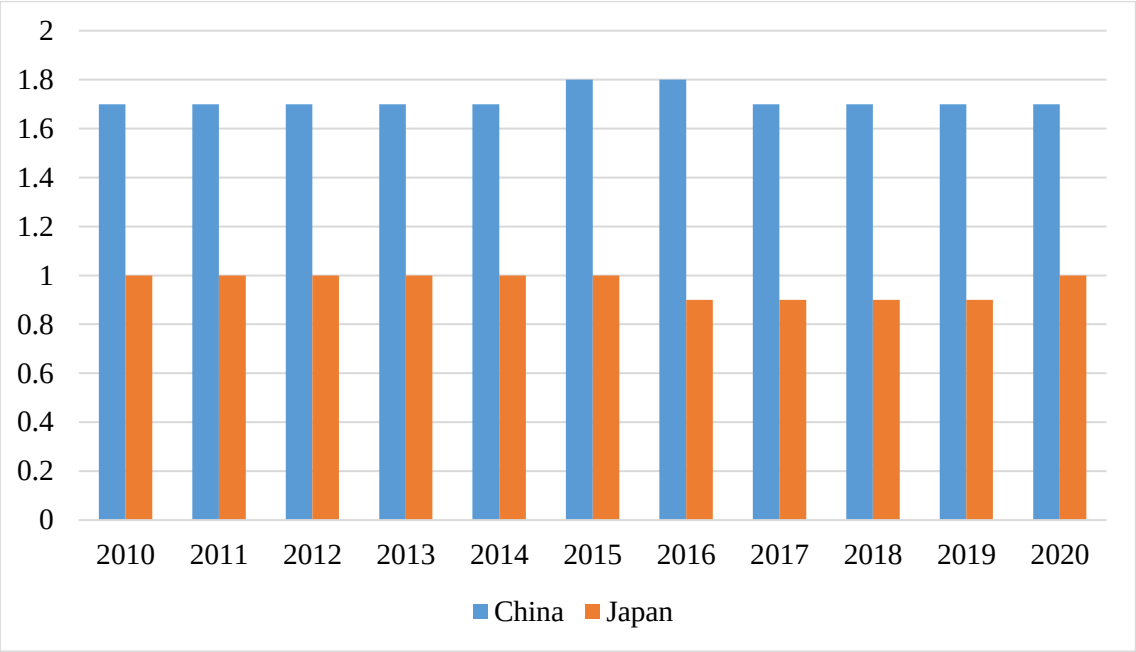


Figure 11: Military expenditure of China and Japan as a percentage of GDP, 2010-2020[1435]

Japan is a non-nuclear weapons state. According to a 1967 parliamentary resolution, Japan has committed not to build, attain or possess them.[1436] The constitution of Japan does not permit it to have military capabilities that are offensive in nature.[1437] However, Japan is a 'latent' nuclear power, having acquired technical expertise to build nuclear weapons in a short period, if desired. Japan's civil nuclear reactors have produced plutonium enough for approximately 6,000 nuclear warheads.[1438] Federation of American Scientists' report maintains, "Japan could possibly produce functional nuclear weapons in as little as a year's time."[1439] Others believe that Japan can build nuclear weapons in just six months.[1440] Japanese scientists also have the required expertise to technically

[1435] Military expenditure by country as percentage of gross domestic product, 1988-2020 © SIPRI 2021, *SIPRI*, accessed January 31, 2022, https://sipri.org/sites/default/files/Data%20for%20all%20countries%20from%201988%E2%80%932020%20as%20a%20share%20of%20GDP%20%28pdf%29.pdf

[1436] Tsuneo Akaha, "Japan's Nonnuclear Policy," *Asian Survey*, Vol. 24, No. 8 (1984), 852-877; Mike M. Mochizuki, Japan Tests The Nuclear Taboo, *Nonproliferation Review*, Vol. 14, No. 2 (2007), 303-328,

[1437] Ibid

[1438] Patrick Minn, Japan has plutonium, rockets and rivals. Will it ever build a nuke?

[1439] Federation of American Scientists, "Japan Special Weapons Guide: Nuclear Weapons Program" Updated June 1, 2012, accessed December 20, 2019, www.fas.org/nuke/guide/japan/nuke

[1440] Patrick Winn, "Japan has plutonium, rockets and rivals. Will it ever build a nuke?" *PRI*, March 14, 2019, accessed January 30, 2022, https://interactive.pri.org/2019/03/japan-nuclear/index.html; Robert Windrem, "Japan has Nuclear 'Bomb in the Basement,' and China isn't Happy," *NBC News*, March 11, 2014, accessed January 30, 2022, https://www.nbcnews.com/storyline/fukushima-anniversary/japan-has-nuclear-bomb-basement-china-isn-t-happy-n48976

reengineer space rockets in a limited time to deliver a nuclear warhead, as Japan has engaged in ballistic missile defense cooperation with the US.[1441]

From the neoclassical realist framework, both internal and external factors are involved in the changing security outlook of Japan, driven primarily by an external factor, that is, the changing strategic environment where China is perceived to be a growing threat to Japan's security. However, Japan's reaction has been, arguably, slow, primarily because of Japan's domestic politics in which remilitarization after WWII is a sensitive issue. But the momentum towards military normalization has been gaining pace in recent years. Japan pursues a nuclear hedging strategy by maintaining the ability to develop nuclear weapons without immediate intent to develop them. However, due to China's emerging nuclear force modernization and the North Korean nuclear threat, a debate has been underway in Japan, and some hawkish elements have argued that Japan should acquire an independent deterrent.[1442]

Since the early Cold War, the geostrategic environment has shaped Japan's security policies, which led it to sign a Treaty of Mutual Cooperation and Security with the US in January 1960.[1443] Initially, it was the threat from the USSR, while China was secondary, but the collapse of the Soviet Union brought China to the forefront (Russia is still part of Japan's threat matrix but it is no longer primary). The treaty provides that a retaliatory attack will emerge from the US against an attacker that strikes out at Japan. [1444] According to a recently declassified document and Federation of American Scientists (FAS) report, between 1954 and 1972, the US had as many as 1200 nuclear weapons of 19 different types stationed in Okinawa prefecture.[1445] Later in 1972, after removing nuclear weapons

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[1441] Norifumi Namatame, "Japan and Ballistic Missile Defense: Debates and Difficulties," *Security Challenges*, Vol. 8, No. 3, 1-17

[1442] Michael Macarthur Bosack, "Revisiting Japan's nuclear arms debate," *The Japan Times*, November 28, 2019, accessed November 15, 2020, https://www.japantimes.co.jp/opinion/2019/11/28/commentary/japan-commentary/revisiting-japans-nuclear-arms-debate/

[1443] Treaty of Mutual Cooperation and Security between Japan and the United States of America. Accessed December 20, 2019. Treaty text available at https://www.mofa.go.jp/region/n-america/us/q&a/ref/1.html

[1444] Ibid

[1445] Japan permitted the US officially to station nuclear weapons at Okinawa prefecture ahead of the Okinawa reversion accord signed in 1969. Okinawa is one of the many prefectures of Japan. After the battle of Okinawa, the US fought during World War II and occupied the prefecture until Japan, and the Allied Powers signed the Treaty of San Francisco in 1951. The treaty gave the US legal jurisdiction over the prefecture for 20 years. During this time, the Pentagon formed dozens of military bases on the prefecture. Thirty-two military bases are still operating in the prefecture. For more details see, Mercedes Trent, The History of U.S. Decision-making on Nuclear Weapons in Japan, August 21, 2019, accessed December 20, 2019, https://fas.org/blogs/security/2019/08/the-history-of-u-s-decision-making-on-nuclear-weapons-in-japan/; Japan officially gave U.S. consent to bring in nuclear weapons ahead of Okinawa reversion accord: document, August 14, 2017, accessed December 20, 2019, https://www.japantimes.co.jp/news/2017/08/14/national/history/japan-officially-gave-u-s-consent-bring-

from the Okinawa prefecture, the prefecture was returned to Japan officially. However, Japan's nuclear threat perception was so high that according to the former US ambassador to Japan, Edwin Reischauer, in an interview with a newspaper in 1981, he claimed that US Naval warships with nuclear weapons on-board were allowed to transit through Japanese ports.[1446] In 1982, Japan articulated its view of the US extended deterrence that "the U.S. nuclear umbrella provides for a first-use option in retaliation for an attack by conventional weapons."[1447] Since 1991, the US has not stationed nuclear weapons in Japan.[1448] It is pertinent to mention that this accord contained a secret clause authorizing the US to reinstate nuclear weapons in case of emergency at Okinawa.[1449] The secret clause also gives an impression that the US naval ships might have nuclear weapons on-board while transiting through the Japanese port. This shows that Japanese leaders had an acute threat perception from nuclear neighbors, such as China and North Korea, and to some extent Russia, which led them to secretly welcome nuclear weapons on their territory despite being a champion and signatory of the Treaty on the Non-Proliferation of Nuclear Weapons (NPT).[1450] Strategic necessity trumped domestic public opinion that likely would not have viewed this favorably.[1451] The same happened in 2021 when the Japanese government refused to sign a Treaty on the Prohibition of Nuclear Weapons (TPNW) despite the fact that 72 percent of the population believes Japan should join the

nukes-ahead-okinawa-reversion-accord-document/#.XfxW5mQzaUm; Maia Hibbett, In Their Fight to Stop a New US Military Base, Okinawans Confront Two Colonizers, May 16, 2019, accessed January 21, 2020, https://www.thenation.com/article/okinawa-japan-us-military/; for more details see Okinawa Prefectural Government, Washington D.C. Office 2016, accessed January 21, 2020, http://dc-office.org/basedata

[1446] Trent, The History of U.S. Decision-making, https://fas.org/blogs/security/2019/08/the-history-of-u-s-decision-making-on-nuclear-weapons-in-japan/

[1447] Masa Takubo, The Role of Nuclear Weapons: Japan, the U.S., and "Sole Purpose", *Arms Control Association*, accessed February 8, 2022, https://www.armscontrol.org/act/2009-11/role-nuclear-weapons-japan-us-%E2%80%9Csole-purpose%E2%80%9D#19

[1448] Yukio Satoh, "Japan's responsibility sharing for the U.S. extended deterrence." *Japan Foreign Policy Forum*, No. 19, https://www.japanpolicyforum.jp/pdf/2014/no19/DJweb_19_dip_01.pdf

[1449] Robert A. Wampler, "The Nuclear Vault: Nuclear Noh Drama – Tokyo, Washington and the Case of the Missing Nuclear Agreements," *The National Security Archive*, October 13, 2009, accessed December 20, 2019, https://nsarchive2.gwu.edu/nukevault/ebb291/

[1450] "Japan's Contribution to Global Nuclear Disarmament and Non-Proliferation: Toward a Policy for Fulfilling the Responsibilities of Japan as the Only Country to have Suffered from Atomic Bombs," *Working Group on New Initiatives for Nuclear Energy and Nuclear Non-Proliferation Sasakawa Peace Foundation*, April 2020, accessed February 6, 2022, https://www.spf.org/en/global-data/user34/Proposal_Non-proliferation_E.pdf; Nobumasa Akiyama and Kenta Horio, "Can Japan Remain Committed to Nonproliferation?" *The Washington Quarterly*, Vol. 36, No. 2 (2013), 151-165; Kazutoshi Aikawa, "Japan's Efforts on Nuclear Disarmament and Non-proliferation," accessed February 6, 2022, https://www.jaea.go.jp/04/iscn/activity/2016-11-29/2016-11-29-02.pdf

[1451] Japanese government pressed on TPNW, The International Campaign to Abolish Nuclear Weapons (ICAN), accessed February 6, 2022, https://www.icanw.org/japanese_government_pressed_on_tpnw

treaty.[1452] After the end of the Cold War, the US signed strategic arms control treaties with Russia to reduce the number of nuclear weapons over time. It generated some apprehensions in Japan over the US commitment. For instance, in 2003, the director-general of Japan's Foreign Ministry's Asian and Oceanian Affairs Bureau, Mitoji Yabunaka, requested then-Assistant Secretary of State for East Asian and Pacific Affairs, James Kelly, "to make sure the United States does not again [as in 1994] promise not to use its nuclear weapons against North Korea if Pyongyang agrees to dismantle its nuclear development program" out of fear of North Korea's chemical and biological weapons and China's military support.[1453]

Table 18. US-Russia Strategic Nuclear Arms Control Agreements

US-Russia Strategic Nuclear Arms Control Agreements					
	SALT I	**INF**	**START I**	**(SORT)**	**New START**
Signed on	May 26, 1972	December 8, 1987	July 31, 1991	May 24, 2020	April 8, 2010
Warhead Deployment Limitation	-	-	6,000	1,700-2,200	1,550
Delivery Vehicle Deployment Limitation	US: 1,710 ICBMs & SLBMs USSR: 2,347	Prohibited ground-based missiles between a 500-5,500km range	1,600	-	700
Entered into Force	October 3, 1972	June 1, 1988	December 5, 1994	June 1, 2003	February 5, 2011
Expiry Date	October 3, 1977	August 2, 2019	December 5, 2009	February 5, 2011	February 5, 2026
Status	Expired	Terminated	Expired	Turned into New START	In force

The global security situation, particularly the Indo-Pacific strategic environment in the 1990s was relatively benign. However, the security environment began to change when, in 2006, North Korea tested nuclear weapons. This led to a new era of US security assurances to its allies in the region. In 2007, after the Security Consultative Committee meeting, a joint statement from the US-Japan noted that "US extended deterrence

[1452] Jake Sturmer and Yumi Asada, "Japan, the only country to experience a nuclear attack, refuses to sign a UN treaty banning nuclear weapons," *ABC News*, January 22, 2021, accessed February 6, 2022, https://www.abc.net.au/news/2021-01-22/hiroshima-survivors-react-as-japan-refuses-to-sign-nuclear-deal/13069848; Thisanka Siripala, "Japan's Dilemma over Nuclear Disarmament," *The Diplomat*, February 10, 2021, accessed February 6, 2022, https://thediplomat.com/2021/02/japans-dilemma-over-nuclear-disarmament/; Ibid

[1453] Takubo, The Role of Nuclear Weapons: Japan, the U.S., and "Sole Purpose"

underpins the defense of Japan and regional security," which includes "the full range of US military capabilities – both nuclear and non-nuclear strike forces and defensive capabilities."[1454] Later, North Korea conducted a series of nuclear weapons tests in 2009, 2013, 2016, and 2017.[1455] China began to flex its economic and military muscles in the region. Following these developments, the Obama administration announced its "Pivot to Asia policy" in 2011 to preserve and enhance a stable and diversified US-led security order with the help of allies and partners in the region.[1456]

With Trump in the White House, US allies began to be wary of the US as statements made by President Trump seemed to undermine the credibility of the US extended deterrence guarantee.[1457] In 2016, during an interview, David Sanger asked, "with the North Korea threat, you think maybe Japan does need its own nuclear?" Trump, who was then running for president election, replied, "well I think maybe it's not so bad to have Japan—if Japan had that nuclear threat, I'm not sure that would be a bad thing for us."[1458] In an interview with Fox News and later at a press conference in Osaka, Japan, after the 2019 G-8 summit, President Trump called the security treaty between the US and Japan 'unfair'.[1459] Trump further added that "if Japan is attacked, we will fight World War III, but if we're attacked, Japan doesn't have to help us at all. They can watch it on a Sony television."[1460]

Despite Trump's statements, his administration appeared supportive of Japan. Recently, in July 2020, the US approved the sale of 105 state-of-the-art fifth-generation F-35 stealth aircraft to Japan. Out of 105, 42 were F-35B capable of short take-off and vertical landing, suitable for aircraft carriers.[1461] The F-35 is the most advanced and sophisticated fighter

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[1454] Secretary of State Condoleezza Rice Secretary of Defense Robert M. Gates Minister for Foreign Affairs Taro Aso Minister of Defense Fumio Kyuma, "Joint Statement of the Security Consultative Committee Alliance Transformation: Advancing United States-Japan Security and Defense Cooperation," May 1, 2007, accessed February 6, 2022, https://www.mofa.go.jp/region/n-america/us/security/scc/joint0705.html

[1455]" Timeline of North Korea's nuclear tests," *Aljazeera*, September 3, 2017, accessed February 7, 2022, https://www.aljazeera.com/news/2017/9/3/timeline-of-north-koreas-nuclear-tests

[1456] Mark E. Manyin, Stephen Daggett, Ben Dolven, Susan V. Lawrence, Michael F. Martin, Ronald O'Rourke and Bruce Vaughn, "Pivot to the Pacific? The Obama Administration's "Rebalancing" toward Asia," *CRS*, March 28, 2012, accessed February 7, 2022, https://sgp.fas.org/crs/natsec/R42448.pdf

[1457] Reuben Steff, *US Foreign Policy in the Age of Trump Drivers, Strategy and Tactics* (New York, Routledge, 2021), 42, 46

[1458] Transcript: Donald Trump Expounds on His Foreign Policy Views, *New York Times*, March 26, 2016, accessed February 7, 2022, https://apjjf.org/-Alexander-Glaser--Zia-Mian/5028/article.pdf.

[1459] Eugene Kiely, "Trump on 'Unfair' U.S.-Japan Security Treaty," July 2, 2019, accessed December 20, 2019, https://www.factcheck.org/2019/07/trump-on-unfair-u-s-japan-security-treaty/

[1460] "Trump's Ignorant Comments About Japan Were Bad Even for Him," Opinion, *The New York Times*, June 28, 2019, accessed February 7, 2022, https://www.nytimes.com/2019/06/28/opinion/trump-japan.html

[1461] "US approves sale of 105 F-35 stealth fighters to Japan," *The Strait Times*, July 10, 2020, accessed January 5, 2021, https://www.straitstimes.com/world/united-states/us-approves-sale-of-105-f-35-stealth-fighters-to-japan

aircraft globally, and its sale to Japan shows the strategic importance of the alliance with Japan. In case of war with China, F-35s will give Japan's air force strategic superiority over the PLAAF.[1462] Additionally, approved during the Trump administration, in March 2022, Japan will acquire US-made Joint Strike Missiles (JSM) for anti-surface and anti-ship operations with a range of 500km.[1463] Together, with these capabilities, Japan's air force will be able to strike China's A2/AD platforms in SCS. Moreover, in August 2019, the US approved the sale of 73 Standard Missile-3 (SM-3) Block IIA to Japan for its BMD system. Japan had a similar deal in April of the same year when it procured 56 Standard Missile-3 (SM-3) Block IB (old version of SM-3 Block II) from the US.[1464] Maintaining such a level of defense cooperation reflects the US commitment during the Trump administration to Japan. Moreover, on the 60th anniversary of the signing of the security treaty between the US and Japan, on January 20, 2020, President Trump said, "as the security environment continues to evolve and new challenges arise, it is essential that our alliance further strengthen and deepen."[1465]

However, it was during the Trump administration that the existing internal discussions in Japan on building up its internal capabilities intensified, including discussion on building nuclear weapons. Certainly, more than Trump's 'flip-flops,' China's force modernization is intensifying the security dilemma for Japan.[1466] This is why Japan is placing a premium on internal options for self-help, such as a discussion over the development of pre-emptive precision capabilities for self-defense, which may include ballistic and cruise missiles.[1467] However, Japan is still examining the issue and has not decided when to acquire these capabilities.[1468] Analysts and academics in Japan have

[1462] Peter Suciu, "Japanese F-35s to Be Armed With Long-Range Standoff Missiles by 2022," *The National Interest*, September 10, 2020, accessed February 8, 2022, https://nationalinterest.org/blog/buzz/japanese-f-35s-be-armed-long-range-standoff-missiles-2022-168731
[1463] Ibid
[1464] Xavier Vavasseur, "US Approves Sale of SM-3 Block IIA ABM Interceptors to Japan," *Naval* News, Aug 28, 2019, accessed January 5, 2021, https://www.navalnews.com/naval-news/2019/08/us-approves-sale-of-sm-3-block-iia-abm-interceptors-to-japan/
[1465] "Trump marks U.S.-Japan security pact with call for stronger, deeper alliance," *Reuters*, January 19, 2020, accessed January 20, 2020, https://www.reuters.com/article/us-usa-japan-security/trump-marks-us-japan-security-pact-with-call-for-stronger-deeper-alliance-idUSKBN1ZI050
[1466] Steff, US Foreign Policy in the Age of Trump Drivers, 42
[1467] Titli Basu, "Will Japan Pursue a Strike Capability in Lieu of Aegis Ashore?" *The Diplomat*, July 28, 2020, accessed February 25, 2021, https://thediplomat.com/2020/07/will-japan-pursue-a-strike-capability-in-lieu-of-aegis-ashore/
[1468] Bruce Klingner, "Japanese Strike Capabilities: Security Advantages for U.S. Alliance, Challenges to Overcome," *The Heritage Foundation*, August 16, 2021, accessed February 8, 2022, https://www.heritage.org/defense/report/japanese-strike-capabilities-security-advantages-us-alliance-challenges-overcome

favored the move, asserting that Japan should maintain a balance of offensive and defensive capabilities rather than prioritize just defensive assets, and it should also critically consider whether it is strategically over dependent on the US.[1469]

Apart from the defense-offense debate, the pro-nuclear weapons constituency is growing, but at a slow pace. A senior political leader of the Liberal Democratic Party (LDP) and former Defense Minister, Shigeru Ishiba, in an interview to the S*hinano Mainichi Shinbun* newspaper on October 25, 2011, said that "we [Japan] should keep the nuclear fuel cycle, which is backed by enrichment and reprocessing, cycling" to keep intact "technical deterrence (this refers to a latent nuclear deterrent capability)." [1470] In 2012, an independent political candidate and Japan's former Defense Minister, Satoshi Morimoto, maintained that Japan's civil nuclear reactors have "very great defensive deterrent functions."[1471] Recently, in early 2016, the government of Shinzo Abe explicitly stated, "there is nothing in the nation's Constitution that forbids pacifist Japan from possessing or using nuclear weapons."[1472] Later, in November 2017, Shigeru Ishiba wrote,

> We need to re-evaluate whether being under the U.S.'s nuclear umbrella is now and in the future working sufficiently to protect Japan. The system could work like this, under 'nuclear sharing' America would strategically place nuclear weapons inside Japan. In peacetime, the ownership would rest with the USA but if there were a serious crisis, Japan would have a limited right to use those weapons.[1473]

The debate over Japan's possible nuclearization is now part of public political discourse. The possibility that Japan will eventually develop nuclear weapons is growing, as it already possesses the means (a full nuclear fuel cycle) to develop them.[1474] Two major obstacles bar Japan from developing a nuclear weapons capability: the first is political,

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[1469] Masuda Tsuyoshi, "Top Japan Strategist says Defense Policy at Turning Point," *NHK News*, July 3, 2020, accessed February 25, 2021, https://www3.nhk.or.jp/nhkworld/en/news/backstories/1171/; Yukio Tajima, "Japan must Rethink Excessive Reliance on US Security, says Expert," *NIKKEI*, July 7, 2020, accessed February 25, 2021, https://asia.nikkei.com/Editor-s-Picks/Interview/Japan-must-rethink-excessive-reliance-on-US-security-says-expert#:~:text=Japan%20must%20rethink%20excessive%20reliance%20on%20US%20security%2C%20says%20expert,-Keio%20professor%20says&text=Instead%20of%20rel

[1470] Peter Hayes, "Nuclear terrorism risks in Northeast Asia: Japan's reactor restart and spent fuel," March 23, 2015, accessed December 20, 2019, https://nautilus.org/napsnet/napsnet-special-reports/nuclear-terrorism-risks-in-northeast-asia-japans-reactor-restart-and-spent-fuel/

[1471] Jake Adelstein, Is Japan about to Hit Its Nuclear Tipping Point?" February 15, 2018, accessed January 19, 2020, https://www.thedailybeast.com/is-japan-about-to-hit-its-nuclear-tipping-point

[1472] Ibid

[1473] Ibid

[1474] Yoko Wakatsuki, James Griffiths and Jessie Yeung, "Shinzo Abe declares Victory in Japan Election"

and the second is institutional.[1475] Ultimately, Japan, at least for now, appears to still be committed to "three non-nuclear principles" outlined by Prime Minister Eisuke Sato in 1967.[1476] The principles claim that Japan will not manufacture, possess, and/or station nuclear weapons from other nations on its territory.[1477]

Nonetheless, these principles are not legally binding. According to Ariel Levite, an expert on Japan's nuclear affairs, "the three principles are carefully worded to allow the development of a standby nuclear capability that stops just short of actual weapons production – allowing Japan to remain within a few months of acquiring nuclear weapons."[1478] Because of this, South Korea long before regarded Japan as an "associate member of the nuclear club."[1479] Secondly, by being a member of the NPT, the IAEA has a robust monitoring mechanism of Japanese civil nuclear facilities. In such an environment, it appears impossible for Japan to have a clandestine nuclear weapons program.[1480] The second obstacle is related to the NPT. Since Japan is a party to NPT, the treaty bounds member states from developing nuclear weapons. Therefore, Japan has to withdraw from the NPT before going nuclear. Article X of the NPT allows any state to withdraw from the treaty on furnishing a three-month notice.[1481] Removing these obstacles depends upon the government's external threat perception and how it interacts with political public opinion; factors are required for change as identified by neoclassical realists.

Despite having a pacifist constitution, the Abe government did introduce significant security reforms in 2013. These reforms include the enactment of Japan's first National Security Strategy (NSS) by establishing the first-ever National Security Council (NSC) in December 2013.[1482] Later in July 2014, Japan's cabinet decided to develop a "Seamless Security Legislation to Ensure Japan's Survival and Protect its People," which was

[1475] Mark Fitzpatrick, "How Could Japan Go Nuclear?"; Jonathan Hunt, "Out of the Mushroom Cloud's Shadow," August 5, 2015, accessed January 21, 2020, https://foreignpolicy.com/2015/08/05/japans-nuclear-obsession-hiroshima-nagasaki/

[1476] Kusunoki Ayako, "The Sato Cabinet and the Making of Japan's Non-Nuclear Policy," *The Journal of American-East Asian Relations* Vol. 15, Special Volume, (2008), 25-50; Tsuneo Akaha, "Japan's Nonnuclear Policy," *Asian Survey* Vol. 24, No. 8, (1984), 852-877

[1477] Ibid

[1478] Ibid

[1479] Ariel E. Levite, "Never Say Never Again: Nuclear Reversal Revisited," *International Security*, Vol. 27, No. 3, (Winter 2002/03), 72

[1480] Susan Turner Haynes, "China's Nuclear Proliferation"

[1481] "Treaty on the Non-Proliferation of Nuclear Weapons (NPT)", *Office of Disarmament Affairs*, accessed February 25, 2021, https://www.un.org/disarmament/wmd/nuclear/npt/

[1482] National Security Strategy, December 17, 2013, accessed October 20, 2020, https://www.cas.go.jp/jp/siryou/131217anzenhoshou/nss-e.pdf

approved in September 2015, and in April 2015, new modifications in the "Guidelines for Japan-U.S. Defense Cooperation" were made.[1483] The new guidelines assuage Japan's fear of alliance abandonment by the US by institutionalizing and raising the US defense commitment to a much higher level.[1484] The guidelines assigned Japan greater responsibilities at the regional and global level, sharing the US burden in sustaining the current order in return for US' comprehensive security commitments.[1485] To contemplate the future of Japan's deterrence policy vis-a-vis China, it is important first to evaluate the existing deterrence policy of Japan and its limitations.

7.4 Japan's Deterrence Posture and Challenges

Japan's deterrence posture is based on two elements: deterrence by denial based on its own capabilities, and deterrence by punishment based on external support.[1486] After the security policy reforms introduced from 2013 to 2015, Japan affirmed its fundamental deterrence posture as being based on maintaining deterrence by denial while relying on the US extended deterrence for deterrence by punishment.[1487] Japan's deterrence posture appears directly congruent to the neoclassical realist approach to a state's policy, which focuses on the interplay of the international dynamics of the system and the internal dynamics of states. Undermining or weakening Japan's deterrence policy would lead to a situation where it would perceive itself vulnerable to other states' security measures and may engage in a costly arms race.

[1483] "Japan's Legislation for Peace and Security, July 1, 2014," accessed October 29, 2020, http://www.cas.go.jp/jp/gaiyou/jimu/pdf/anpohosei_eng.pdf; "The Guidelines for Japan-U.S. Defense Cooperation April 27, 2015," accessed October 27, 2020, https://www.mofa.go.jp/files/000078188.pdf

[1484] Tomohiko Satake, "The New Guidelines for Japan-U.S.Defense Cooperation and an Expanding Japanese Security Role," *Asian Politics and Policy*, Vol. 8, No. 1 (2016), 27-38

[1485] Ibid

[1486] Deterrence theorists, in general, distinguish between the two categories of deterrence strategies; deterrence by punishment and deterrence by denial. For Lawrence Freedman, deterrence based on capability for defeating an attack and denying an adversary their objectives is largely more credible than threatening an adversary with massive retaliation where perceived costs outweigh perceived benefits merely because a deterrer has less space/options in invoking military actions for deterrence by denial than deterrence by punishment; whereas in deterrence by punishment, there is no option other than massive retaliation. Deterrence by denial posture provides a capability for damage limitation if deterrence fails. For more details see, Eric Heginbotham, and Richard J. Samuels, "Active Denial: Redesigning Japan's Response to China's Military Challenge," *International Security*, Vol. 42, No. 04, (date) 128-69; Lawrence Freedman, *Deterrence* (Cambridge: Polity Press, 2004), 38-40

[1487] Hirofumi Tosaki, "The North Korean Nuclear Issue and Japan's Deterrence Posture," *The Japan Institute of International Affairs*, accessed October 21, 2020, https://www2.jiia.or.jp/en/pdf/digital_library/world/170314_tosaki.pdf

7.4.1 **Deterrence by Denial and the Curious Decision to Forgo Aegis Ashore**

Japan's deterrence capabilities are mainly based on defensive systems. It operates eight Aegis BMD to defend itself from adversary attacks and maintains approximately 900 warplanes, 48 destroyers, and 21 submarines for defense.[1488] Japan's air force operates 147 F-35s, rendering it the largest user of American stealth fighters.[1489] However, it is now considering acquiring an offensive strike capability to augment its deterrent, as noted above.

Though the ballistic missile interception success rate is not 100 percent, the fact BMD might intercept some missiles from China (or North Korea) reduces the credibility of the prospective attackers' threats by introducing doubt into their military calculations and, therefore, augments Japan's options for denying China's coercive options.[1490] A more robust BMD system would further strengthen Japan's position as it is continuously modernizing its BMD capabilities partnered with the US.[1491]

Japan's deterrence by denial capabilities adds to the credibility of US extended deterrence. The level of political commitment among allies and the damage limitation capabilities of the deterrer are two critical factors that affect the credibility of extended deterrence. Japan-US security cooperation includes collective defense of each other. Such collective security cooperation solidifies the alliance, enhancing Japan's deterrence by denial posture, even if China threatens Japan with nuclear weapons.[1492] Moreover, as Japan's deterrence capabilities supplement the US' damage-limitation posture, the chances of the invocation of the US extended deterrence diminishes.[1493] However, several challenges related to Japan's deterrence posture also exist and are contemplated below.

[1488] "AP, Japan's Military, Among World's Strongest, Looks to Build," *US News*, December 6, 2021, accessed February 9, 2022, https://www.usnews.com/news/world/articles/2021-12-05/japans-military-among-worlds-strongest-looks-to-build; Mike Yeo, "Japan launches second Taigei-class submarine, 'Hakugei,'" *Defense News*, October 15, 2021, accessed February 9, 2022, https://www.defensenews.com/global/asia-pacific/2021/10/14/japan-launches-second-taigei-class-submarine-hakugei/Valerie Insinna, "US gives the green light to Japan's $23B F-35 buy," *Defense News*, July 10, 2020, accessed February 9, 2022, https://www.defensenews.com/smr/2020/07/09/us-gives-the-green-light-to-japans-massive-23b-f-35-buy/

[1489] Ibid

[1490] "Navy Aegis Ballistic Missile Defense (BMD) Program: Background and Issues for Congress," *CRS*, Updated December 9, 2021, accessed February 9, 2022, https://sgp.fas.org/crs/weapons/RL33745.pdf; Hideaki Kaneda, Kazumasa Kobayashi, Hiroshi Tajima, and Hirofumi Tosaki, "Japan's Missile Defense Diplomatic and Security Policies In a Changing Strategic Environment, *The Japan Institute of International Affairs*," March 2007, accessed February 9, 2022, March 2007

[1491] Ibid

[1492] Tosaki, "The North Korean Nuclear Issue and Japan's Deterrence Posture," 11-12

[1493] Ibid

Japan has presently deployed a multi-layered BMD system comprising mainly the Aegis system and the Patriot system. The Patriot, or PAC-3, is a land-based BMD system designed to intercept missiles at the terminal phase when a missile re-enters the atmosphere. Japan aims to use PAC-3 if the Aegis, an upper-tier mid-course system, is unsuccessful in intercepting incoming missiles. Japan deployed PAC-3 for the first time in 2007 with the help of the US, and it now possesses seven batteries.[1494] The Aegis is a sea and land-based missile defense system that aims to intercept a missile at a mid-course level before it reaches the terminal phase of trajectory. The system employs Standard Missile-3 (SM-3) Block IA, which can engage any incoming IRBM within a range of 1000km.[1495] The sea-based components of Japan's Aegis include eight destroyers[1496] which are in service.[1497] Japan and the US have mutually developed the SM-3 Block IIA missile for the BMD system to counter medium- or intermediate-range missiles. It is believed to have greater precision than its predecessor, and the missile has been in service since 2019.[1498]

Japan initially decided to build two Aegis Ashore BMD sites in 2017, one at the northern end and the other at the southern end of its territory, which would have employed the SM-3 Block IIA interceptor. Later in June 2020, the Japanese government backed out of the project.[1499] Japan's then-Defense Minister Taro Kono stated that Japan's decision to suspend the Aegis Ashore project was based on two reasons: the cost of the system and technical issues.[1500] The technical issues were related to the rocket booster. The Japanese government was concerned that the rocket booster on the SM-3 IIA, which separates from the interceptor, could fall on civilian sites. Therefore, it could put population centers and

[1494] Reif, "U.S. and Allied Ballistic Missile Defenses"
[1495] Ibid
[1496] Mike Yeo, "Japan's New Missile Defense Destroyer starts Sea Trials amid Aegis Ashore Saga," *Defense News*, June 23, 2020, https://www.defensenews.com/global/asia-pacific/2020/06/23/japans-new-missile-defense-destroyer-starts-sea-trials-amid-aegis-ashore-saga/
[1497] Mike Yeo, "Japan's new missile defense destroyer"
[1498] Megan Eckstein, "MDA Director Says SM-3 Block IIA Ready for Production, Unrelated to Japan's Decision to Back Out of Aegis Ashore," *USNI*, June 19, 2020, accessed October 24, 2020, https://news.usni.org/2020/06/19/mda-director-says-sm-3-block-iia-ready-for-production-despite-safety-concerns-from-co-developer-japan; "Missile Defense Project, Standard Missile-3 (SM-3)," *Missile Threat*, Center for Strategic and International Studies, June 14, 2016, last modified July 15, 2021, https://missilethreat.csis.org/defsys/sm-3/
[1499] Sam LaGrone, "Japan Backing Away From Aegis Ashore," USNI News, June 15, 2020, accessed November 19, 2020, https://news.usni.org/2020/06/15/japan-backing-away-from-aegis-ashore
[1500] Ibid

infrastructure at risk.[1501] Japan's MoD declared that software improvements alone could not resolve the problem.[1502] As such, the missile requires redesigning. Financially, it was estimated by the Japanese government that the overhaul required would cost an additional 1.8 billion USD, and it would take more than a decade to implement the project. Based on these factors, Japan's NSC approved the cancellation of the project; however, according to *Jane's* report, the Japan Ministry of Defense signed a $287.3 million contract with the US Navy to procure an unspecified number of SM-3 Block IIA interceptors.[1503]

Nevertheless, after evaluating different analyses and reviews, such explanations appear to be not entirely persuasive for abandoning the Aegis Ashore project, as the system would appear to be vital for Japan's national defense.[1504] The previous government of Prime Minister Shinzo Abe claimed that an additional layer of the Aegis Ashore BMD system was critical for Japan's security because North Korea's emerging missile threat would overburden the existing sea-based Aegis systems.[1505] Moreover, the sea-based Aegis system has inherent shortcomings as it requires regular refueling, routine maintenance, and uncertain seas, which hamper the system's operational readiness. Aegis Ashore was considered as a solution to these problems.[1506]

Moreover, considering the Aegis Ashore BMD system's strategic importance and comparing it with the current assessment of the risk it possesses, the Japanese government apprehensions do not seem to be persuasive. Japan's concern over the small debris and potential relatively minor damage that could occur to civilian sites, as noted above, appears disproportionate compared with the Japanese government assessment of the threat to national security as a result of a successful nuclear strike, which would risk the lives of hundreds of thousands or millions of citizens. It is almost impossible for military planners to achieve an ideal situation when it comes to defensive BMD that would ensure

[1501] Jeffrey W. Hornung, "Japan Is Cancelling a U.S. Missile Defense System," *RAND Corporation*, July 6, 2020, accessed October 24, 2020, https://www.rand.org/blog/2020/07/japan-is-canceling-a-us-missile-defense-system.html
[1502] Ibid
[1503] Kosuke Takahashi, "Japan signs USD287 million contract for SM-3 Block IIA interceptor missiles," *JANES*, February 11, 2021, accessed February 8, 2022, https://www.janes.com/defence-news/news-detail/japan-signs-usd287-million-contract-for-sm-3-block-iia-interceptor-missiles
[1504] Tom Karako, "Shield of the Pacific: Japan as a Giant Aegis Destroyer," *Center for Strategic & International Studies*, 23 May 2018, accessed October 25, 2020, https://www.csis.org/analysis/shield-pacific-japan-giant-aegis-destroyer
[1505] Ibid; Megan Eckstein, "Japan Officially Ends Aegis Ashore Plans After National Security Council Deliberations," *USNI*, June 26, 2020, accessed December 25, 2020, https://news.usni.org/2020/06/26/japan-officially-ends-aegis-ashore-plans-after-national-security-council-deliberations
[1506] Hornung, "Japan Is Cancelling a U.S. Missile Defense System"

zero threat to civilian sites. Japan's policymakers must be aware of prioritizing objectives, as they are operating two state-of-the-art BMD systems and could have faced such operational situations. Subsequently, according to a recent US Air Force report, a software improvement mechanism exists to address such issues for other US BMD systems.[1507] This also generates suspicion as to whether Japan's claim that BMD software could not be fixed was legitimate. It is important to note here that according to former Japanese Defense Minister, Itsunori Onodera, who initially approved the purchase of the Aegis Ashore, "the Defense Ministry has repeatedly explained that the booster can be controlled, but it abruptly changed its position. This means the Ministry has lied."[1508]

Moreover, the reasoning behind the cost estimation also appears dubious. It was initially estimated that the cost for purchasing, operating and maintaining Aegis Ashore for the next 30 years would be $2.15 billion.[1509] According to some analysts, recent estimates showed that the cost had increased to at least $4.1 billion, double the initial estimate.[1510] However, it is common for major defense acquisitions to experience cost-overruns. For instance, the US Government Accountability Office (US GAO) found that the F-35 fighter jet is eight years behind schedule and $165 billion over budget, overall.[1511] Therefore, the reason that cost-overrun was the issue appears weak.

It was also embarrassing when Japan's MoD revealed that the site for Aegis Ashore deployment was selected using Google Earth software, and none of the planners had physically visited the sites.[1512] Japan's military has a long history of operating and maintaining air and missile defense systems, and such neglect at the hands of supposedly extremely proficient and experienced defense planners also appears questionable.

[1507] Michael Unbehauen and Christian Decker, "Japan Cancels Aegis Ashore: Reasons, Consequences, and International Implications," September 25, 2020, accessed October 25, 2020, https://www.airuniversity.af.edu/JIPA/Article-Display/Article/2361398/japan-cancels-aegis-ashore-reasons-consequences-and-international-implications/

[1508] Masuda Tsuyoshi, "Diplomatic and defense implications of halting Aegis Ashore," *NHK World-Japan*, June 17, 2020, accessed October 25, 2020, https://www3.nhk.or.jp/nhkworld/en/news/backstories/1142/

[1509] Unbehauen and Decker, "Japan Cancels Aegis Ashore"; Hornung, "Japan Is Cancelling a U.S. Missile Defense System"

[1510] Ibid; Peter A. Wilson and John V. Parachini, "Russian S-400 Surface-to-Air Missile System: Is It Worth the Sticker Price?" *RAND Corporation*, 6 May 2020, accessed February 8, 2022, https://www.rand.org/blog/2020/05/russian-s-400-surface-to-air-missile-system-is-it-worth.html

[1511] Mike Gooding, "More Bad News for F-35: Upgrades Billions of dollars Over Budget," *13News Now*, July 14, 2021, accessed February 9, 202, https://www.13newsnow.com/article/news/national/military-news/f-35-upgrades-billions-of-dollars-over-budget/291-9aa0ef41-29d3-4d06-b43c-f8fef3b47f25

[1512] Lucy Craft, "Why Japan scrapped a $4 billion missile defense purchase from the U.S.," *CBS News*, July 2, 2020, accessed October 25, 2020, https://www.cbsnews.com/news/aegis-ashore-japan-scraps-us-purchase-missile-defense-outrage-at-home-trump-distracted/

A critical consideration reflects that Japan's officially stated arguments, based on technical and financial issues, for the termination of Aegis Ashore were structured deliberately to cancel the BMD project. Japan's government, instead, is revisiting its strategic policies and reorientation, realigning its capabilities in-line with an intensified level of threat perception of China. A careful examination of Japan's international outlook reveals that it is gradually adopting the status of great power, therefore, it prefers a balance in the offensive to defensive capabilities like other great powers, in addition to being just an economic power.[1513] It is also in-line with the new US-Japan defense guidelines mentioned above. The shift started in the early 2000s, partly because China, whose economy was already growing, began to raise it economy and later its military at a rapid pace. It was expected that China's economic rise would augment its military strength, and that would have implications for the US-led security architecture of the Indo-Pacific. The North Korean threat is still relevant, it certainly paved the way for the justification of change in the defense policy of Japan.[1514]

Instead of examining other defensive non-provocative alternatives to the BMD system to strengthen its defense, Japan plans to procure capabilities to attack an adversary's missile bases. Its posture is shifting to become more offensive. On June 25, 2020, Japan's Defense Minister stated that to strengthen its missile defense Japan is considering the acquisition of weapons capable of striking adversary missile bases before an adversary launches them.[1515] Moving from defensive to offensive capabilities is a significant decision but not entirely new as in 2017, the governing Liberal Democratic Party (LDP) had already examined the option.[1516] Abandonment of the Aegis Ashore project, however, has revived the debate over Japan's deterrence policy. Such a capability appears to strengthen Japan's 'offensive defense,' as Japan is now considering acquiring a range of capabilities to entirely deny access to adversary's strikes. Currently, Japan seems to be looking for strike capabilities to augment its existing BMD capabilities to deter an

[1513] Unbehauen and Decker, "Japan Cancels Aegis Ashore"
[1514] Linus Hagstrom and Christian Turesson, "Among Threats and a 'Perfect Excuse': Understanding Change in Japanese Foreign Security Policy," *Korean Journal of Defense Analysis*, Vol. 21, No. 3, (2009), 297-314
[1515] Jeffrey W. Hornung, "Is Japan's Interest in Strike Capabilities a Good Idea?" *War on the Rocks*, July 17, 2020, accessed October 25, 2020, https://warontherocks.com/2020/07/is-japans-interest-in-strike-capabilities-a-good-idea/; also see Tim Kelly, "Japan to Consider Strike Capability to Replace Missile Defense System," *Reuters*, June 25, 2020, https://www.reuters.com/article/us-japan-defense-kono/japan-to-consider-strike-capability-to-replace-missile-defense-system-idUSKBN23W10Y
[1516] Ibid

adversary from launching an attack.[1517] Also, if deterrence fails, it would help Japan limit the damage by reducing the number of incoming missiles capable of reaching Japan before they are launched, and intercepting the remaining missiles in the air before they strike. This indicates that Japan's threat perception is growing and exacerbating the security dilemma, which has altered its security policy significantly, as it is moving gradually away from defensive deployments towards pre-emptive capabilities. Once it approves a plan of acquiring enemy-base strike capability, Japan will acquire the land-based version of the Tomahawk and ballistic missiles from the US. This would enable it to strike strategic areas in China. In turn, China can be expected to augment and adjust its military deployments directed towards Japan.

In 2020, Japan's MoD announced a plan to induct long-range cruise missiles with a range of 500-900km to be mounted on F-15 aircraft after some modification.[1518] These missiles include Joint Air-to-Surface Standoff Missile - Extended Range (JASSM-ER) – a long-range, conventional, air-to-ground, precision standoff missile and a precision-guided, long-range anti-ship missile (LARSM).[1519] The Japanese Defense Minister also argued that these missiles could be used to attack adversaries' bases.[1520] The range of these missiles can be further enhanced by other means such as air-to-air refueling. The plan for F-15 upgrades for JASSM-ER and LARSM is supposed to be completed by 2027.[1521] The growing fleet of Japanese F-35s with JASSM-ER and LARSM would also augment Japan's capability to implement such a strategy. Japan is also developing land-based hypervelocity gliding projectiles units for its defense.[1522] These are the steps by Japan's DoD to achieve greater strike capability. Such a missile inventory would enable Japan to strike inside North Korea and some parts of China. It is important to note here that the US 2018 NPR also pledges to develop long-range standoff cruise missiles capable of

[1517] "Japan to Revise Security Strategy with Halt to Aegis Ashore System," *The Asahi Shimbun*, June 20, 2020, accessed October 26, 2020, http://www.asahi.com/ajw/articles/photo/31200839
[1518] "If you have 'enemy base attack capability', switch to offensive exclusive defense-oriented policy," Prime Minister's statement of consideration, June 19, 2020, accessed October 27, 2020, https://www.sankei.com/politics/news/200619/plt2006190034-n1.html
[1519] "National Defense Program Guidelines, Medium Term Defense Program (FY 2019 - FY 2023)," Japan MoD, December 18, 2018, accessed October 27, 2020, https://www.mod.go.jp/j/approach/agenda/guideline/2019/pdf/chuki_seibi31-35_e.pdf
[1520] Ibid, 12
[1521] Yoshihiro Inaba, "Japan to Greatly Extend Range of Type 12 Anti-Ship Missiles, Modify it For F-15J," *Naval News*, January 21, 2021, accessed February 9, 2022, https://www.navalnews.com/naval-news/2021/01/japan-to-greatly-extend-range-of-type-12-anti-ship-missiles-modify-it-for-f-15j/
[1522] Ibid, 4

carrying nuclear weapons.[1523] The first missile is slated to be produced in 2026, and the USAF plans to procure 1,000 missiles, as discussed in Chapter Six.[1524]

How cost-effective the new strike capability system would be, as such a pre-emptive system would require a range of associated and supporting infrastructure capable of gathering intelligence, surveillance, and reconnaissance with ideally a 'fire and forget' mode (a missile mode which does not require further guidance to strike the target once launched) to target mobile and deeply buried missiles in silos. This may require a robust early warning system, strong cyber capabilities, and the means to deceive and degrade an adversary's defense systems. All of these systems would require time to develop and deploy and be cost-intensive, perhaps more than the Aegis Ashore system. However, Japan might be interested in relying on the existing US ISR platforms as Yasuhiro Takeda, a professor at Japan's National Defense Academy, argues that if Japan uses US satellites for intelligence gathering, it will significantly reduce the cost and time required for the development of strike capability.[1525] However, if Japan plans to rely on the US ISR capabilities, it also has to reset its command and control mechanism as it would require deep integration with the US over operational issues.[1526]

Japan's pre-emptive strike capability would also have an impact on the existing US-Japan strategic alliance. The relationship between the US and Japan is often associated with a 'shield and spear' where Japan is a defensive (the shield) power, and the US is designated as an offensive (the spear) power. The US seems to be willing to support Japan's decision of procuring pre-emptive enemy base strike capability as per new US-Japan defense guidelines.[1527] However, if Japan shifts to a greater offensive role and pursues a more unilateralist strategy in its region, it could affect the alliance for two reasons.[1528] First, if

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[1523] "The 2018 NPR," x

[1524] Ibid; Shannon Bugos, "U.S. Nuclear Modernization Programs," *Arms Control Association*, January 2022, accessed February 9, 2022, https://www.armscontrol.org/factsheets/USNuclearModernization

[1525] Daishi Abe, "US satellites would slash cost of Japan defensive strike: Expert," *Nikkei Asian Review*, 15 July 2020, https://asia.nikkei.com/Business/Aerospace-Defense/US-satellites-would-slash-cost-of-Japan-defensive-strike-expert

[1526] Jeffrey W. Hornung, "Modeling a Stronger U.S.-Japan Alliance: Assessing U.S. Alliance Structures," *Center For Strategic And International Studies*, November 2015, accessed October 29, 2020, https://spfusa.org/wp-content/uploads/2015/11/151109_Hornung_Alliance_Models.pdf

[1527] Robin Sakoda, "The 2015 U.S.-Japan Defense Guidelines: End of a New Beginning," *CSIS*, April 30, 2015, accessed February 9, 2022, https://amti.csis.org/the-2015-u-s-japan-defense-guidelines-end-of-a-new-beginning/

[1528] "The Guidelines for U.S.-Japan Defense Cooperation, April 27, 2015," accessed October 29, 2020, https://archive.defense.gov/pubs/20150427_--_GUIDELINES_FOR_US-JAPAN_DEFENSE_COOPERATION.pdf; Jeffrey Hornung and Scott Harold, "Japan's Potential Acquisition of Ground-Launched Land-Attack Missiles: Implications for the U.S.-Japanese alliance," *War*

Japan's decision-makers plan to retaliate against North Korea or Chinese missile deployments, their US treaty-bound counterparts may seek to ensure that the US does not get dragged into the conflict if it was a strategy they had never planned or consented to. This scenario would worry the US because any missile attack from Japan may fly through South Korean air space and provoke an attack against South Korea, where a considerable amount of US forces are stationing. Japan also hosts a large number of US troops. Any abrupt response from the USFJ may invite a strike on South Korea and USFK. The main problem is that Japan and South Korea are not part of each other's war plans, and the US is in alliance with both. [1529]

The second reason involves a conflict with China. Three scenarios are considered here.[1530] First, Japan's capability to target China's missile bases would have strategic implications for Japan and the US, as China bases its conventional and nuclear missile forces together. US policymakers and its strategic force command would not be comfortable with any Japanese operations that may involve prospects of strategic escalation without prior consultation and cooperation with the US. Second, any such pre-emptive planning against China would require strong ISR, cyber, space, and electronic warfare capabilities, given that China is huge geographically and there is a considerable difference between Japan and China's strategic forces, (see table below). Building military capability for a pre-emptive strike would require a host of new capabilities, increased defense spending, and technical and strategic support from the US. This may divert Japan's focus from other critical areas of operation, such as China's A2/AD operations in the SCS during the initial stage of conflict. Moreover, Japan has a small landmass, and its pre-emptive capability would be easy to detect and destroy, inviting a massive conventional strike from China against critical infrastructure. The last scenario involves the identification of the objectives, this would need to be achieved mutually. The US would prefer targets to be struck first that may cause more damage to the continental US, such as nuclear command and control, DF-41s, DF-5s, and SSBNs. In contrast, Japan would prefer targets of a sub-strategic nature, such as medium-range missiles, PLAAF, and China's naval assets. That

on the Rocks, September 9, 2021, accessed February 9, 2022, https://warontherocks.com/2021/09/japans-potential-acquisition-of-ground-launched-land-attack-missiles-implications-for-the-u-s-japanese-alliance/

[1529] Ibid

[1530] Ibid

Japan would strike A2/AD operation formations so that the US would have greater access to the region is difficult to know and it may create differences between allies.[1531]

Japan's policymakers must be aware that these possible reasons and scenarios could negatively affect the US-Japan alliance. These emerging challenges and changes reflect the regional security dynamics wherein China's emerging military modernization intensifies Japan's threat perception and gradually induces a change in its deterrence by denial posture – a posture primarily maintained by Japan's self-defense forces.

The table below presents the difference in capabilities of China and Japan. Though the difference is significant as China has a greater numerical advantage, Japan has a qualitative edge over China. However, China's new next-generation stealth aircraft, long-range bombers, and next-generation Type-96 SSBNs will be technologically more advanced. It is also interesting to note how Japan is pursuing a new balance between defensive-offensive capabilities. For instance, it is converting helicopter carriers into aircraft carriers.

Table 19. China vs. Japan Capabilities[1532]

Armed Forces		China	Japan
Manpower	Active personnel	2,185,000	247,150
	Reserve personnel	8,000,000	56,100
Tanks		63,000	1,004
Artillery pieces		7,000	623
Fighter aircraft		1600	155
Bomber/Attack		450	79
Aircraft carriers		2	1 (conversion of 2nd helicopter carrier into aircraft carrier is due by 2022)
Destroyers		38	36
Frigates		48	2
Submarines	Ballistic Missile Submarines (SSBNs)	6	0
	Nuclear-powered attack submarines (SSNs)	9	0
	Diesel-electric attack submarines (SSKs)	56	22

The region, and specifically China, will view Japan's new strike capability as an offensive deployment for pre-emption as part of its obligations to the US through the Toyko-

[1531] Hornung and Harold, "Japan's Potential Acquisition of Ground-Launched Land-Attack Missiles"
[1532] "Chapter Six: Asia," *The Military Balance,* Vol. 121, Issue 1, 218-313

Washington alliance. Japan's 2021 DWP cites China's activities in the region as "unilateral attempts to change the status quo," which poses an "imminent threat to Japan."[1533] The 2020 DWP also noted such activities as a threat by China, but in a lighter tone. The DWP maintained that China's military modernization trends, lack of transparency in defense policies, and military activities "have become a matter of grave concern to the region including Japan and the international community."[1534]

Moreover, North Korea's missile and nuclear sites and China's strategic deployments in the South and East China Sea would be vulnerable to Japan's new strike capability. Conversely, according to the 2015 amendments in the Japanese constitution, Japan's Prime Minister and Cabinet (*Kantei*) will have the power to decide whether certain adversaries or situations possess an imminent threat to Japan.[1535] Previously, article 9 of the Japanese constitution pledged Japan to "renounce war as a sovereign right of the nation and the threat or use of force as means of settling international disputes."[1536] Such a stance and decisions to be taken in this regard will open a new Pandora's box of legal, operational, and doctrinal questions. For example, if Japan is not in a state of war, when would it choose to launch a first strike. Japan's efforts towards its security could entrap it in a costly arms race with China, and make Japan less secure by making China insecure, with both exacerbating the security dilemma. In a crisis, Japan's strike capability may increase incentives for China and North Korea to launch a pre-emptive attack on Japan to gain early victory, given their awareness of Japan's emerging first-strike missile capabilities. Much like concerns in the 1950s among US and Soviet strategists that fears that the other side might launch a first strike since (this might be the only way to gain an advantage in the event of conflict) could lead one party to pre-emptively strike first – even if neither wanted war – the same logic could come to apply to Japan and

[1533] "On the Publication of Defense of Japan 2021," *2021 Defense of Japan*, Ministry of Defense, accessed February 11, 2022, https://www.mod.go.jp/en/publ/w_paper/wp2021/DOJ2021_EN_Full.pdf
[1534] "On the Publication of Defense of Japan 2020," *2020 Defense of Japan*, Ministry of Defense, accessed February 11, 2022, https://www.mod.go.jp/en/publ/w_paper/wp2020/pdf/R02010202.pdf
[1535] William Read, "Military Normalisation in Japan; A Foregone Conclusion?" *News, Australian Institute of International Affairs*, September 13, 2015, accessed February 11, 2022, https://www.internationalaffairs.org.au/news-item/military-normalisation-in-japan-a-foregone-conclusion/; Tomohiro Osaki, "Shinzo Abe calls for Japan's 'Rebirth' in 2020 along with Constitutional Revision," *The Japan Times*, December 19, 2017, accessed February 11, 2022, https://www.japantimes.co.jp/news/2017/12/19/national/politics-diplomacy/shinzo-abe-calls-japans-rebirth-2020-along-constitutional-revision/#.Wnmlto5PO8U
[1536] Yasuo Hasebe, "What comes after Japan's Constitutional Amendment?" *East Asia Forum*, July 21, 2017, accessed February 11, 2022, https://www.eastasiaforum.org/2017/07/21/what-comes-after-japans-constitutional-amendment/

Chinese/North Korean strategic relations; first-strike pressures could come to the fore.[1537] Perhaps, China's new missile silo fields partly address China's fear and counters Japan's shifting posture. The reasons for China's new silo fields could be many, for instance, to deter/counter advancing US capabilities to support China's rise to superpower status and prepare to practice extended deterrence if necessary, and to signal Japan that it cannot pre-empt China's nuclear/missile strikes.

The abandonment of the Aegis Ashore project has opened a broader discussion about the future of Japan's security and defense policies, what type of military capabilities it wants to acquire, the posture it wants to adopt, and the power it wants to become. The change is emerging, and has regional drivers and extra-regional supporters. The change is also signaling that Japan, apart from burden-sharing with the US for regional security, is also looking for military capabilities to operate independently.[1538] The US-Japan alliance is further maturing as both allies respond to a regional change in a way that complements each other's interests and capabilities.

7.4.1.1 The Japan-US Alliance

Arguably, no ally of the US shares the same level of threat perceptions, interests, and concerns with the US the way Japan does. According to article VI of the US-Japan Treaty of Mutual Cooperation and Security,

> For the purpose of contributing to the security of Japan and the maintenance of international peace and security in the Far East, the United States of America is granted the use by its land, air and naval forces of facilities and areas in Japan.[1539]

Later, new defense guidelines were added to the 1960 treaty as supplements in 1978 and 1997.[1540] In 2015, guidelines for the defense cooperation of Japan and the US were issued,

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[1537] Khoo and Steff, "Security at a Price," 1-27

[1538] Kelly C. Wadsworth, "Should Japan Adopt Conventional Missile Strike Capabilities?" *Asia Policy*, Vol. 14, No. 2 (2019), 61-88; "Smaller Area of Defense Was Key Factor in Halting Aegis Ashore Deployment in Japan," *The Japan News*, June 20, 2020, accessed February 11, 2022, https://the-japan-news.com/news/article/0006623805

[1539] Ibid

[1540] Responding to 1978 defense guidelines, a senior official from Japan MoD stated, "the Security Treaty with the United States was already established. We only lacked the means to implement the treaty…" The 1997 defense guidelines were the revision of the original version of the treaty to create a foundation for more effective Japan-US cooperation if Japan comes under attack or the situation becomes volatile in the surrounding region. The 1997 guidelines focused on a broad framework and offered policy direction for both states regarding their roles and ways of cooperation. Koji Murata, "Do the New Guidelines Make the Japan-US Alliance More Effective?" *The Japan-US Alliance: New Challenges for the 21st Century*. (ed.) Masashi Nishihara. (Tokyo: Japan Center for International Exchange, 2000), 19-38; Daniel Flores, *Deterrence and Assurance: The US Commitment to Japan*, Thesis, Stanford University, June 2014, accessed November 5, 2020,

these reviewed the existing framework of cooperation and policy direction, and updated it.[1541] In August 2017, two cabinet-level officers from Japan and two from the US concurred on the way forward to further strengthen the Japan-US alliance by reaffirming to Japan's security, by all means necessary, "including U.S. nuclear forces."[1542]

The treaty is vital for the US for its forward military deployment in the Indo-Pacific region. According to the US official US Forces Japan (USFJ) website, the USFJ is comprised of the US Army, Marine Corps, Navy, and Air Force. "Approximately 54,000 US military personnel, 45,000 dependents, 8,000 DoD civilian and contractor employees" are stationed in Japan.[1543] *USS Ronald Reagan,* which is a forward-deployed aircraft carrier, is permanently stationed in Japan. It spends half of each year at sea. Japan also spends about $1.8 billion to support the US forces each year as host nation support.[1544]

In recent years, China's military modernization and its growing assertive military posture to enforce its claims in the South China Sea and the East China Sea, particularly claims over the Senkaku/Diaoyu Islands, have pushed Japan to solidify defense and further increase cooperation with the US. The exceptionalism in the Japan-US strategic alliance is also featured in deterrence strategy. Compared with NATO, which is considered a nuclear alliance and has a joint nuclear policy, planning, and arrangements, the Japan-US alliance is governed by extended deterrence, but there is no joint nuclear policy, planning, and arrangements. Surprisingly, Japan does not allow the entry of US nuclear weapons into the country. However, according to an interview with former US ambassador Edwin Reischauer's in 1981, Japan has allowed US ships with nuclear weapons on board to pass its ports secretly in the past.[1545] Japan might be continuing this same practise today.

According to Roehrig, "the nuclear umbrella was part of the US general deterrence operations to defend Japan from the Soviet Union and China in the Cold War."[1546] With

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https://stacks.stanford.edu/file/druid:hp710pd1945/The%20Credibility%20of%20Extended%20Deterrence%20and%20Assurance-%20The%20US%20Commitment%20to%20Japan.pdf; "The Guidelines for Japan-U.S. Defense Cooperation," Ministry of Defense, Japan, September 23, 1997, accessed November 5, 2020, https://www.mod.go.jp/e/d_act/us/anpo/19970923.html

[1541] "Japan-U.S. Security Arrangements," Ministry of Foreign Affairs of Japan, March 6, 2020, https://www.mofa.go.jp/region/n-america/us/security/arrange.html

[1542] Ibid

[1543] U.S. Forces, Japan, accessed November 2, 2020, https://www.usfj.mil/About-USFJ/

[1544] Yukio Tajima, "The US and Japan to start Contentious Talks over Host-Nation Support, *NIKKEI Asia*, October 6, 2020, accessed November 2, 2020, https://asia.nikkei.com/Politics/International-relations/US-and-Japan-to-start-contentious-talks-over-host-nation-support

[1545] Trent, The History of U.S. Decision-making, https://fas.org/blogs/security/2019/08/the-history-of-u-s-decision-making-on-nuclear-weapons-in-japan/

[1546] Roehrig, "Japan, South Korea, and the United States Nuclear Umbrella," 103

China's nuclear force modernization, the threat is imminent, the situation has shifted to immediate deterrence, prompting directed statements from the US ensuring Japan nuclear guarantees.[1547] The US and Japan felt a strategic imperative to sign the "Security Treaty" in September 1951 due to expanding communist threats in the region. The treaty in January 1960 became the "Treaty of Mutual Cooperation and Security between Japan and the United States of America."[1548]

The conflict with Communist USSR and China was judged to be so grave (and likely to occur at any time) that to establish immediate deterrence, the US, from 1954 to 1972, had to keep 1200 nuclear weapons stationed in Japan.[1549] The end of the Cold War led to progress in the political relations of the great powers, and states began to discuss, and in some instances act on, the reduction of nuclear weapons.[1550] However, with Xi's initiation of nuclear weapons force modernization, things began to change. More pro-nuclear weapon capability voices are being heard in Japan now than ever before, and likewise in South Korea, policymakers are demanding the US station nuclear weapons in South Korea.[1551] However, more people are in favor of developing South Korea's own nuclear weapons capability than stationing US nuclear weapons in the country.[1552] This suggests officials in Japan and South Korea think the possibility of future crises – in which a shift from general to immediate deterrence would occur – is growing. New capabilities are required to buttress general deterrence and, if necessary, to ensure that if immediate deterrence occurs (a crisis), deterrence can be effectively practiced to prevent descent into war. Japan may not be able to deter adversaries with nuclear weapons, such as China and North Korea, with its conventional capability. It requires nuclear capability to balance the

[1547] Ibid
[1548] Treaty of Mutual Cooperation and Security between Japan and the United States of America. Accessed December 20, 2019. Treaty text available at https://www.mofa.go.jp/region/n-america/us/q&a/ref/1.html
[1549] Mercedes Trent, "The History of U.S. Decision-making on Nuclear Weapons in Japan, August 21, 2019," accessed December 20, 2019, https://fas.org/blogs/security/2019/08/the-history-of-u-s-decision-making-on-nuclear-weapons-in-japan/
[1550] "U.S.-Russia Nuclear Arms Control 1949–2019," *CFR*, accessed January 9, 2021, https://www.cfr.org/timeline/us-russia-nuclear-arms-control
[1551] Ariel E. Levite, "Never Say Never Again: Nuclear Reversal Revisited," *International Security*, Vol. 27, No. 3, (2002), 69; Wyn Bowen and Matthew Moran, "Living with Nuclear Hedging," *International Affairs*, Vol. 91, Issue 4, (2015); Peter Wynn Kirby, "Japan's Plutonium Problem," *New York Times*, August 16, 2015, accessed February 111, 2022, https://fsi-live.s3.us-west-1.amazonaws.com/s3fs-public/social_science_seminar_-_japans_shift_in_the_nuclear_debate_s._romei.pdf; Dalton and Han, "Elections, Nukes, and the Future of the South Korea–U.S. Alliance"
[1552] Ibid

equation with North Korea and China, therefore Japan and South Korea must rely on the US capabilities for deterrence by punishment.[1553]

7.4.2 Deterrence by Punishment: US Nuclear Umbrella and Japan's Security

Before moving ahead, it is important to mention that many analysts tend to confuse and conflate *extended deterrence* with *a nuclear umbrella*.[1554] Extended deterrence is a broad security commitment made by a state to an ally to defend it. This may involve a wide range of capabilities, including conventional and nuclear weapons; whereas a nuclear umbrella is the nuclear weapons component of extended deterrence. The two terms are not interchangeable even though nuclear weapons are (obviously) always present when mentioning a 'nuclear umbrella' and sometimes present when discussing extended deterrence.

Since its inception, the US nuclear umbrella has often been an informal arrangement between the US and a close partner or ally, with limited coordination on nuclear planning between both states. However, over time, with the mounting apprehensions over North Korea's nuclear and missile program and growing animosity with China amidst its nuclear force modernization, Japan's defense policymakers have been more concerned with implementation and the credibility of the US nuclear umbrella. With these growing regional threats and the increasing sense of vulnerability, Japan feels its security is eroding, requiring a US commitment to defend Japan, including through the use of its nuclear deterrent, if necessary.[1555]

For Japan, China is believed to be an imminent threat and long-term security concern. The US nuclear umbrella has, more consistently, focused on the China-Japan rivalry given it is perhaps, relative to North Korea, a more severe and long-lasting security issue. This is evident as China's nuclear weapons program was in its initial stage when the US provided Japan with extended deterrence; at this time, North Korea did not have nuclear

[1553] "Japan to seek assurance of U.S. defense pledge, including nuclear deterrence," *Reuters*, August 15, 2017, accessed February 11, 2022, https://www.reuters.com/article/us-japan-usa-defence-idUSKCN1AV046; Tosaki, "The North Korean Nuclear Issue and Japan's Deterrence Posture"
[1554] Terence Roehrig, *Japan, South Korea, and the United States Nuclear Umbrella* (New York: Columbia University Press, 2017) 17
[1555] James L. Schoff, "Changing Perceptions of Extended Deterrence in Japan," in *Strategy in the Second Nuclear Age: Power, Ambition, and the Ultimate Weapon*, (eds.) James Holmes and Toshi Yoshihara (Washington, DC: Georgetown University Press, 2012), 99-101

arms.[1556] Also, according to some US officials, China and Japan's threat perception is "deeply ingrained."[1557] Japanese analysts are apprehensive that China will use nuclear weapons to intimidate Japan into settling territorial disputes such as the Senkaku/Diaoyu Islands. Furthermore, in June 2021, Japan's deputy defense minister stated, "we have to protect Taiwan as a democratic country" in a conflict.[1558] China has been saber-rattling towards Taiwan, violating ADIZ of Taiwan and Japan, and carrying out military exercises with Russia. This increases Japan's threat perception of China. Some opine that China may not resort to nuclear weapons; however, the US nuclear umbrella is still required to offset China's geopolitical influence and growing conventional capabilities. Table 19 above shows how China's conventional capabilities are now far greater than Japan's in sheer numbers.[1559]

The nuclear umbrella also has political value, underpinning the Japan-US alliance and the US-led regional security order. The US nuclear umbrella forms one part of a larger series of US-centric military alliances, the overall credibility of the alliance also supports the political and economic relationships, and the alliance, in turn, bolsters the US guarantee. According to one US official, Japanese concerns are not relative to the credibility of the US nuclear umbrella but the overall state of the alliance; if the alliance were generally unreliable, it would compromise its nuclear guarantee aspect.[1560] It is unclear under what circumstances the US would use nuclear weapons, rather the fundamental underpinning of the alliance concerns the possibility of using nuclear weapons.[1561] If the US deliberately altered its nuclear assurances by reverting from the first use or conditioning nuclear assurances against the adversary's first nuclear attack only, it would jeopardize the status quo and raise questions over its commitment. Direct actions, such as the rapid provision of US assistance after the March 2011 tsunami struck Japan; President Obama reaffirming his support for Japan over the Senkaku Islands in 2014, and President Trump's statement that Washington is committed to Japan's security in 2017, and

[1556] Richard J. Samuels and James L. Schoff, "Japan's Nuclear Hedge: Beyond 'Allergy' and Breakout," in *Strategic Asia 2013–14: Asia in the Second Nuclear Age*, eds. Ashley J. Tellis, Abraham M. Denmark, and Travis Tanner (Seattle: National Bureau of Asian Research, 2013), 245-251
[1557] Terence Roehrig, *Japan, South Korea, and the United States Nuclear Umbrella: Deterrence After the Cold War* (New York, Columbia University Press, 2017), 105
[1558] "Japan's deputy defense minister says Taiwan must be protected 'as a democratic country'," *CNN*, June 29, 2021, accessed February 11, 2022, https://edition.cnn.com/2021/06/29/asia/japan-taiwan-defense-intl-hnk/index.html
[1559] Roehrig, "Japan, South Korea, and the United States Nuclear Umbrella"
[1560] Ibid, 106
[1561] Ibid

President Biden's reaffirmation to the US-Japan security treaty falls within the scope of Article V of the alliance, all reaffirms Japanese confidence in the alliance.[1562] The April 2015 Japan-US Defense Guidelines were an important sign of US defense commitment with a declaration of US-backed deterrence with specific mention of nuclear forces in this regard.[1563] The guideline notes, "The United States will continue to extend deterrence to Japan through the full range of capabilities, including U.S. nuclear forces."[1564]

7.4.2.1 The Credibility of US Extended Nuclear Deterrence

The US has claimed to provide extended deterrence to Japan since the beginning of the Cold War. However, there were hardly any details available in the open-source literature on the US extended deterrence as to what conditions will and what conditions will not constitute an attack on Japan that will generate a nuclear response from the US. Even Japanese officials were not aware of US plans until recently when in 2010, the US started the Extended Deterrence Dialogue (EED) with Japanese officials.[1565] One Japanese official described the US nuclear umbrella, "it is like a talisman from the United States. Japan is not sure how it works, but they put their faith in it and believe it will protect them."[1566] A growing North Korean nuclear threat and fears of China's expansionism are cause for concern within Japan over the credibility of the US nuclear-extended deterrence. As threats increased to Japan's territorial sovereignty during the 2000s (as outlined above),

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[1562] Treaty of Mutual Cooperation and Security Between Japan and the United States of America, January 19, 1960, accessed November 23, 2020, https://www.mofa.go.jp/region/n-america/us/q&a/ref/1.html; Justin McCurry and Tania Branigan, "Obama says US will defend Japan in island dispute with China," *The Guardian*, April 24, 2014, accessed February 11, 2022, https://www.theguardian.com/world/2014/apr/24/obama-in-japan-backs-status-quo-in-island-dispute-with-china; David Nakamura and Abby Phillip, "Trump reaffirms U.S.-Japan security alliance in bid to soothe fears in Tokyo, *The Washington Post*," February 10, 2017, accessed February 11, 2022, https://www.washingtonpost.com/politics/japanese-prime-minister-visits-white-house-but-trumps-travel-ban-dominates-event/2017/02/10/95ad4b2a-efa6-11e6-9662-6eedf1627882_story.html; "Security, China dominate Biden's talks with Japan's Kishida," *Aljazeera*, January 21, 2022, accessed February 11, 2022, https://www.aljazeera.com/news/2022/1/21/security-china-to-dominate-bidens-talks-with-japans-kishida

[1563] Japan Ministry of Defence, "The Guidelines for Japan-U.S. Defence Cooperation," April 27, 2015, accessed November 28, 2020, https://www.mofa.go.jp/files/000078188.pdf

[1564] Ibid

[1565] Yukio Satoh, "U.S. Extended Deterrence and Japan's Security, Livermore Papers on Global Security No. 2," *Center for Global Security Research*, October 2017, accessed November 7, 2021, https://cgsr.llnl.gov/content/assets/docs/satoh-report-final.pdf; Brad Roberts, "Extended Deterrence and Strategic Stability in Northeast Asia," *NIDS Visiting Scholar Paper Series*, No.1, August 9, 2013, accessed November 7, 2021, http://www.nids.go.jp/english/publication/visiting/pdf/01.pdf; Richard C. Bush, "The U.S. Policy of Extended Deterrence in East Asia: History, Current Views, and Implications." *Brookings* Arms Control Series Paper 5, February 2011, accessed November 7, 2021, https://www.brookings.edu/wp-content/uploads/2016/06/02_arms_control_bush.pdf

[1566] Quoted in James L. Schoff, *Realigning Priorities: The U.S.-Japan Alliance and the Future of Extended Deterrence* (Cambridge, MA: Institute for Foreign Policy Analysis, March 2009), http://www.ifpa.org/pdf/RealignPriorities.pdf

Japan regarded them as increasingly existential and questioned the US credibility of US extended deterrence.[1567] Conservatives in Japan have also begun to suggest that Japan should have its own nuclear weapons to counter Chinese nuclear force modernization and the North Korean threat.[1568]

The table below compares China and Japan (and US) strategic capabilities. Since the US provides Japan with extended nuclear deterrence, the US strategic capabilities are considered vital to Japan given Toyko lacks its own strategic capability. However, Japan may develop nuclear-technology capability in the near future, as a senior political leader from the previously ruling Liberal Democratic Party (LDP) has argued in favor of acquiring nuclear powered submarine.[1569] The closeness of that future is, as yet, unknown.

Table 20. China vs. Japan (US) strategic capabilities[1570]

China-Japan(US) Strategic Capabilities			
	China	**Japan**	**US Strategic Capabilities**
Land-based ballistic missiles	280 (300+ newly found silos based)	-	400
Submarine-launched ballistic missiles	6 SSBNs, each carries 12 SLBMs; Total: 72	-	14 SSBNs (**9 in Pacific** & 5 Atlantic) each carrying up to 20 SLBMs: Total: 280
Bombers	20	-	20 B-2 + 40 B-52 (**4 deployed in Guam**[1571]): Total 60

To reduce growing apprehensions, in July 2009, the US and Japanese officials began a formal dialogue, the Extended Deterrence Dialogue (EDD), to focus on the defense of

[1567] O'Neill, "Asia, the U.S., and Extended Nuclear Deterrence," 89; Mike Mochizuki and Jiaxiu Han, "Is China Escalating Tensions With Japan in the East China Sea?" *The Diplomat*, Semtember 15, 2020, accessed February 12, 2022, https://www.proquest.com/docview/2442807590?parentSessionId=MUDM2aLKCHqA3IFRUj2n%2BV9yqzE72MIUAkuvS8gCXCc%3D&pq-origsite=primo&accountid=17287

[1568] Michael Macarthur Bosack, "Revisiting Japan's nuclear arms debate," *The Japan Times*, November 28, 2019, accessed December 4, 2020, https://www.japantimes.co.jp/opinion/2019/11/28/commentary/japan-commentary/revisiting-japans-nuclear-arms-debate/

[1569] Michito Tsuruoka, "AUKUS, Japan and the Indo-Pacific: Strategic rationales and challenges," *Policy Briefs, EU-Asia Project* Issue 2021/51 November 2021, accessed February 12, 2022, https://cadmus.eui.eu/bitstream/handle/1814/72960/QM-AX-21-051-EN-N.pdf?sequence=1&isAllowed=y

[1570] Kristensen and Korda, "Nuclear Notebook: Chinese nuclear forces 2021"; Kristensen and Korda, "Nuclear Notebook: United States Nuclear Weapons, 2021"; "U.S. Strategic Nuclear Forces: Background, Developments, and Issues," *CSR*, Updated December 10, 2020, accessed March 3, 2021, https://fas.org/sgp/crs/nuke/RL33640.pdf; Chapter Six: Asia, The Military Balance, Vol. 121, Issue 1, 218-313

[1571] "4 U.S. B-52H bombers deployed to Guam," *Yonhap News Agency*, January 31, 2021, accessed March 3, 2021, https://en.yna.co.kr/view/AEN20210131002000325

Japan involving nuclear weapons. The discussions included "the elements of nuclear deterrence" with Assistant Secretary of State Kurt Campbell adding that "our goal here is to make a very strong commitment to Japan…the nuclear umbrella remains strong and stable, and our commitment to Japan is absolutely unshakable."[1572] The EDD continues to meet quietly about twice a year at Japan's request.[1573] A press release on the February 2015 meeting stated the EDD provided an opportunity for the governments to speak frankly and exchange views on securing alliance deterrence within the larger security and defense cooperation. Through this dialogue, the release added that Japan "can deepen understanding on its mechanisms and coordinate its security policy with the U.S. government."[1574] In the previous year (2014), the State Department maintained that the EDD "reinforces the credibility of the U.S. defense commitment to Japan, including thorough discussions about strategic and conventional capabilities, and helps to promote regional stability from a near- and long-term perspective."[1575]

The EDD dialogue in 2019 was focused directly on enhancing alliance deterrence as part of the US-Japan security cooperation.[1576] For years, simple announcements about EDD have provided reassurance to the Japanese public.[1577] The US maintains that the US-Japan alliance is the linchpin of its Asia policy, and it provides crucial forward basing to the US forces, which gives Japan confidence in its position.[1578] Therefore, meetings of the EDD have enabled both countries to discuss nuclear weapons, extended deterrence, strategy,

[1572] "Japan, U.S. to Launch Talks on 'Nuclear Umbrella'," Global Security Newswire, *NTI*, July 20, 2009, accessed December 1, 2020, http://www.nti.org/gsn/article/japan-us-to-launch-talks-on -nuclear-umbrella/
[1573] Terence Roehrig, *Japan, South Korea, and the United States Nuclear Umbrella: Deterrence After the Cold War* (New York, Columbia University Press, 2017), 108
[1574] Ministry of Foreign Affairs of Japan, "Japan, U.S. Extended Deterrence Dialogue," February 16, 2015, accessed November 28, 2020, http://www.mofa.go.jp/press/release/press4e_000637.html
[1575] "U.S.-Japan Extended Deterrence Dialogue," U.S. Department of State, June 9, 2014, https://2009-2017.state.gov/r/pa/prs/ps/2014/06/227303.htm
[1576] "Japan-U.S. Extended Deterrence Dialogue," Ministry of Foreign Affairs, Japan, June 10, 2019, accessed December 9, 2020, https://www.mofa.go.jp/press/release/press4e_002470.html
[1577] Terence Roehrig, *Japan, South Korea, and the United States Nuclear Umbrella: Deterrence After the Cold War* (New York, Columbia University Press, 2017), 108
[1578] "U.S.-Japan Extended Deterrence Dialogue, 2014," 2019; Lindsay Maizland and Nathanael Cheng, "The U.S.-Japan Security Alliance," *CFR*; Richard L. Armitage and Joseph S. Nye, "The U.S.-Japan Alliance: Anchoring Stability in Asia," *CSIS*, August 2012, accessed February 12, 2022, https://csis-website-prod.s3.amazonaws.com/s3fs-public/legacy_files/files/publication/120810_Armitage_USJapanAlliance_Web.pdf; Interview with Michael Finnegan, Richard Lawless, and Jim Thomas, Updating the U.S.-Japan Alliance, *The National Bureau of Asian Research*, April 2, 2010, accessed February 12, 2022, https://www.nbr.org/publication/updating-the-u-s-japan-alliance/

and planning, developing the understanding of these concepts as they impact each country differently. Japan encourages dialogue and insight into US planning.[1579]

A small part of the political elite and the pro-nuclear lobby are distressed over Japan's security and argue for Japan to develop its own nuclear weapons program. To them, it is not the lack of confidence in the US security assurance but the rising regional threat from China and North Korea that may undermine US guarantees. And Trump's adventurous political rhetoric added fuel to these pro-nuclear debates. However, on the ground, the US and Japan alliance has grown stronger in recent years due to rising regional threats. The initiation of EED dialogue, operationalization of the QUAD, increasing US military presence in the Indo-Pacific, and regular military exercises involving other partners and allies to ensure freedom of navigation in the Indo-Pacific are steps that have been taken in this regard.

Alternatively, similar to fears present during the Cold War, Japan fears a "decoupling" from the nuclear umbrella due to the greater development of Chinese and North Korean nuclear forces, which has made the US homeland more vulnerable.[1580] China has possessed the ability to accomplish a strike against the US homeland since the mid-1980s, yet the US-Japan alliance has remained stable. However, much has changed since then as, according to some Japanese analysts, there is a possibility that China might achieve parity in nuclear weapons with the US in the future.[1581] China's newly discovered missile silo fields suggest that China is on track to achieve this. The outcome of the US-China nuclear weapons parity could establish MAD, which might weaken the credibility of the US nuclear umbrella. Japan's official view is that once MAD prevails between the US and China, the latter would have a greater chance of deterring the former from interfering in the disputes in the South China Sea involving Japan, such as over the Senkaku/Diaoyu Islands, and China would become more aggressive if it established secure second-strike capability.[1582] Following this debate, some US analysts wrote that the US nuclear superiority and nuclear modernization aimed at sustaining this superiority gives Japan peace at night.[1583] The US 2018 NPR, to a great extent, addressed Japan's fear of

[1579] Ibid
[1580] O'Neill, "Asia, the U.S., and Extended Nuclear Deterrence," 88–89; and Schoff, "Changing Perceptions of Extended Deterrence in Japan," 108–109.
[1581] Terence Roehrig, *Japan, South Korea, and the United States Nuclear Umbrella: Deterrence After the Cold War* (New York, Columbia University Press, 2017), 112
[1582] Ibid, 113
[1583] Ibid; Kroenig, The Logic of American Superiority, 1-15

decoupling and abandonment by introducing new capabilities and policy changes discussed in the next section.

7.5 The US 2018 Nuclear Posture Review and Japan

The 2018 NPR reversed the Obama administration's efforts to minimize the role of nuclear weapons in US defense policy. This policy change is based on the rationale that other states have altered nuclear doctrines and modernized nuclear weapons; the US must respond in kind and try to create a capability that ensures US weapons will not be useless in conflict. Owing to this, and as discussed in the previous chapter, the 2018 NPR called for "tailored" and "flexible" capabilities, such as a layer of new "low-yield" nuclear weapons for SLBMs and a new "nuclear-armed SLCM," and "incorporating *nuclear capability* onto the forward-deployable, nuclear-capable F-35."[1584] The US is on track to achieve these capabilities. The US Navy began deploying "a new low-yield version of the W-76 warhead for SLBM Trident II (D-5) missiles" in February 2020.[1585] The Biden administration has also begun research and development on "new nuclear-armed SLCM and associated warhead," as called by the Trump administration NPR.[1586] The SLCM, once called a "bad idea" by Biden, will be low-yield relative to the Trident SLBM and will be ready for deployment by 2031.[1587] The Japanese then-Foreign Minister Taro Kono stated,

> Japan highly appreciates the latest NPR which clearly articulates the U.S. resolve to ensure the effectiveness of its deterrence and its commitment to providing extended deterrence to its allies including Japan, in light of the international security environment which has been rapidly worsened since the release of the previous 2010 NPR.[1588]

[1584] "The 2018 NPR," xii-x

[1585] "A Low-Yield, Submarine-Launched Nuclear Warhead: Overview of the Expert Debate," *In Focus CRS*, January 5, 2021, accessed February 12. 2022, https://sgp.fas.org/crs/nuke/IF11143.pdf

[1586] "Nuclear Sea-Launched Cruise Missiles Are Wasteful," *Center for Arms Control and Non-Proliferation*, accessed February 13, 2022, https://armscontrolcenter.org/wp-content/uploads/2021/06/SLCM-N.pdf

[1587] Ibid; David Hambling, "U.S. Navy Funds New Submarine-Launched Nuclear Cruise Missile Biden Called 'A Bad Idea' (UPDATED - Acting Navy Secretary Wants To Defund)," *Forbes*, June 2, 2021, accessed February 13, 2022, https://www.forbes.com/sites/davidhambling/2021/06/02/us-navy-funds-new-submarine-launched-nuclear-cruise-missile-biden-called-a-bad-idea/?sh=313ad96822b2

[1588] Press Releases, "Statement by Foreign Minister Taro Kono, The Release of the U.S. Nuclear Posture Review" (NPR) February 3, 2018, accessed February 13, 2022, https://www.mofa.go.jp/press/release/press4e_001893.html; Frank A. Rose, "Is The 2018 Nuclear Posture Review As Bad As The Critics Claim It Is? Policy Brief," *Foreign Policy at Brookings*, April 2018, accessed February 13, 2022, https://www.brookings.edu/wp-content/uploads/2018/04/fp_20180413_2018_nuclear_posture_review.pdf

The 2018 NPR also emphasized extended deterrence, reassurance to allies, and placed a premium on tailored deterrence. The 2018 NPR *excludes* the reference made by the previous NPR to the need to preserve strategic stability, which acknowledging China's second-strike capability as part of this equation.[1589]

To conclude this case study, China's nuclear weapons program and its recent modernization have forced Japan to adopt a position contradictory to its stance on nuclear weapons but fundamentally necessary according to realist assumptions. Japan, in some respects, is caught in a paradox and although its "nuclear allergy" remains a major element of Japanese society, and it maintains staunch public support for eliminating nuclear weapons,[1590] it also relies on US extended deterrence and emphasizes that US credibility must remain credible for Japan's defense. Additionally, despite strong public distaste towards nuclear weapons, Japanese policymakers have intermittently examined the possible acquisition of nuclear weapons. In the end, at present, it is not in Japan's interest at this time to seek nuclear weapons. Instead, Japan appears likely to continue to rely on the US extended deterrence so long as the alliance remains stable and credible and the US military remains in the region in force. Japan's policy orientation here is driven by the circumstance that every new addition to China's land, sea, or air-based nuclear weapons makes Japan less secure as both states have a contentious history and have conflicting maritime territorial claims. To address this security dilemma, every step that Japan takes to improve its security makes China feel more insecure. Japan's cancellation of Aegis Ashore and planning to develop pre-emptive strike capability are the signs of a security dilemma leading to the stirring of an arms race. Also, as the region is fraught with multiple overlapping territorial conflicts, any move from China is followed by a series of moves from other states, creating a domino effect on the arms race in the region of which the US is an extra-regional member.

The Japan-US regional alliance also remains critical for the US, as Japan is the pivot of the US extra-regional presence in Northeast Asia and, more broadly, the US-led security architecture in the Indo-Pacific region. Thus, the US nuclear-extended deterrence highlights a much larger interrelationship that assures Japan and the US of mutual security commitments. Japan relies heavily on the US for deterrence by punishment, and for this

[1589] "The 2010 NPR," vi

[1590] "U.S., Japan Oppose and China Abstains as U.N. Votes to Launch Talks on Nuclear Arms Ban," *Japan Times*, October 28, 2016, http://www.japantimes .co.jp/news/2016/10/28/world/politics-diplomacy-world/u-s-japan-oppose -china-abstains-u-n-votes-launch-talks-nuclear-arms-ban/.

reason, in November 2015, it established Alliance Coordination Mechanism (ACM) to further enhance operational coordination and strengthen bilateral planning.[1591] Together, the US and Japan are developing ballistic missile technology, such as the successful development of the SM-3 Block II interceptor in 2019.[1592] Additionally, both states are cooperating to improve and develop new space, cyber, ASW, and AI capabilities.[1593] Japan is the biggest recipient of F-35 fighter jets and an active member of the US-led QUAD; an alliance committed to a "free, open, and inclusive Indo-Pacific."[1594] More importantly, aligning with the US, Japan, in an unprecedented way, emphasized in its 2021 DWP that "stabilizing the situation surrounding Taiwan is important for Japan's security."[1595] Such a level of strategic cooperation is based on the need to counter threats common to the US and Japan. The alliance is likely to thrive for the foreseeable future, given that the US security assurances remain unwavering and grow as the threat grows.

The alliance politics theory suggests that Japan is unlikely to abandon the alliance based on the discussion above. It is improbable and implausible that Japan would abandon the alliance with the US and form an alliance with a former adversary, China, as both have a history of conflict, maritime territorial disputes, and more importantly, Japan supports Taiwan's right to independence. Also, it is located at a distance from China and North Korea, unlike South Korea, which has an adversary at the gate and requires China's political support against North Korea. The entrapment of Japan in alliance with the US is also a distant reality. Japan is an active member of the QUAD. It welcomed the Trump administration's NPR without the hesitation that a lowered nuclear threshold could be counter-productive for its own security. Moreover, for Japan, the cost of abandonment runs higher than entrapment in alliance with the US. Without any doubt, the US is a formidable nuclear power and the only power that can check China's rising power. Additionally, Japan's latent nuclear power keeps it safe from being entrapped in alliance with the US.

[1591] Japan Ministry of Defence, "The Guidelines for Japan-U.S. Defence Cooperation," April 27, 2015, accessed November 28, 2020, https://www.mofa.go.jp/files/000078188.pdf

[1592] "Missile Defense Project, Standard Missile-3 (SM-3)," *Missile Threat*, Center for Strategic and International Studies, June 14, 2016, last modified July 15, 2021, accessed February 13, 2022, https://missilethreat.csis.org/defsys/sm-3/.

[1593] Maizland and Cheng "The U.S.-Japan Security Alliance"

[1594] Saheli Roy Choudhury, "The Quad countries pledge to promote an Indo-Pacific region that is 'undaunted by coercion'," *CNBC*, September 27, 2021, accessed February 13, 2022, https://www.cnbc.com/2021/09/27/quad-leaders-summit-us-india-japan-australia-statement-on-indo-pacific.html

[1595] "On the Publication of Defense of Japan 2021," 19

Both the US and Japan share the same interest in preserving the freedom of navigation in the Indo-Pacific; both are committed to Taiwan's independence and containment of China. Moreover, there is less asymmetry in capabilities, as the US is open to sharing, transferring, and selling the most advanced military capabilities to Japan. The sale of hundreds of F-35s, BMD systems, latest interceptors are a few examples of this. Lastly, the commitment from the US to Japan's security and nuclear assurances are explicitly mentioned and claimed by the US, coming directly from US presidents.

7.6 Nuclear China and Implications for South Korea

China's nuclear weapons force modernization has security implications for South Korea, the second state in proximity to China with security guarantees from the US. Three possible scenarios may lead China and South Korea into a conflict: a conflict between North and South Korea, a direct military confrontation between China and South Korea, and a conflict between the US and China. Regardless of these scenarios, China's land and sea-based nuclear-capable ballistic missiles have strategic implications as China might use them in a crisis on the Korean peninsula in support of North Korea or during a direct conflict between the US and China wherein South Korea acts as an ally in US military operations. In the worst-case scenario, these missiles could be used to target military installations inside South Korea, used to disrupt or deny the US reinforcements to South Korea, hence offsetting US extended deterrence, and/or used to blackmail South Korea in a crisis or conflict.

After the withdrawal of US nuclear weapons from South Korea in 1991, China normalized its relations with South Korea in 1992, marking a diplomatic earthquake between China and South Korea.[1596] Simultaneously with this, China was increasing its defense budget, which increased from $21.9 billion in 1990 to *$*244.9 billion in 2020. However, its military and diplomatic support for North Korea, which conducted a series of nuclear weapons in 2006, 2009, 2013, 2016, and 2017, and has tested a range of delivery vehicles, negatively affected its relations with South Korea.[1597] It also led to the deployment of THAAD in South Korea in 2017. The deployment was a signal that

[1596] Ibid

[1597] "North Korea," *Nuclear Threat Imitative,* October 2020, accessed January 11, 2020, https://www.nti.org/learn/countries/north-korea/

policymakers in South Korea see the US as a critical security provider against North Korea. [1598] China views that,

> the coverage of the THAAD missile defense system in the ROK, especially the monitoring scope of the X-band radar, goes far beyond the defense need of the Korean Peninsula. It will reach deep into the hinterland of Asia, which will...directly damage Chinese strategic security interests.[1599]

Some Chinese scholars have argued that the THAAD X-band radar could potentially detect trajectories of Chinese missiles.[1600] Bin writes that the X-band radar allows the US to discern between decoys and real warheads, which would undermine the nuclear deterrent capability of China.[1601] Moreover, it will lead to a nuclear arms race in the region.[1602] The deployment of the THAAD led to China's economic coercion of South Korea, as it blocked South Korean services and goods from entering China.[1603] However, towards the end of 2017, the South Korean government signed an agreement with China to normalize relations, promising that South Korea would not deploy additional batteries of the THAAD, or integrate its system with the US BMD system, and would not enter into a triangular alliance with the US and Japan.[1604] China's economic coercion of South Korea led to the development of a negative image of China in South Korea. According to a Pew global poll, in October 2020, 83 percent of South Koreans said they did not trust President Xi Jinping to do "the right thing in world affairs."[1605] Moreover, some South

[1598] Ji-Young Lee, "The Geopolitics of South Korea–China Relations Implications for U.S. Policy in the Indo-Pacific," *RAND*, November 2020, accessed January 11, 2021, https://www.rand.org/pubs/perspectives/PEA524-1.html

[1599] China's Ministry of Foreign Affairs, Wang Yi Talks about US's Plan to Deploy THAAD Missile Defense System in ROK, February 13, 2016, accessed January 31, 2022, http://www.fmprc.gov.cn/mfa_eng/zxxx_662805/t1340525.shtml.

[1600] Li Bin, "The Security Dilemma and THAAD Deployment in the ROK," *China-US Focus*, March 6, 2017, accessed January 31, 2022, http://www.chinausfocus.com/foreign-policy/2017/0306/14759.html; Wu Riqiang, "South Korea's THAAD: Impact on China's Nuclear Deterrent," *S. Rajaratnam School of International Studies Commentary*, July 27, 2016, accessed January 31, 2022, https://www.rsis.edu.sg/wpcontent/uploads/2016/07/CO16192.pdf.

[1601] Ibid

[1602] Sukjoon Yoon, "Upgrading South Korean THAAD," *The Diplomat*, May 10, 2021, accessed January 30, 2022, https://thediplomat.com/2021/05/upgrading-south-korean-thaad/

[1603] Ethan Meick and Nargiza Salidjanova, "China's Response to U.S.-South Korean Missile Defense System Deployment and its Implications," *U.S.-China Economic and Security Review Commission*, July 26, 2017, accessed January 31, 2022, https://www.uscc.gov/sites/default/files/Research/Report_China%27s%20Response%20to%20THAAD%20Deployment%20and%20its%20Implications.pdf

[1604] Troy Stangarone, "Did South Korea's Three Noes Matter? Not So Much," *The Diplomat*, October 30, 2019, accessed January 31, 2022, https://thediplomat.com/2019/10/did-south-koreas-three-noes-matter-not-so-much/

[1605] Chung Min Lee, "Between China and the United States," *Carnegie Endowment for International Peace*, October 21, 2020, accessed November 15, 2020, https://carnegieendowment.org/2020/10/21/south-korea-is-caught-between-china-and-united-states-pub-83019

Korean analysts view China's assertiveness in the region as growing with the increasing regular violation of South Korean ADIZ and its territorial waters.[1606]

Table 21. China vs. South Korea Defense Expenditure[1607]

China vs. South Korea Defense Expenditure ($ Billions)					
States	Years				
	2000	**2005**	**2010**	**2015**	**2020**
China	43.07	79.9	143.9	213.5	244.9
South Korea	22.2	27.4	33.9	39.2	46.05

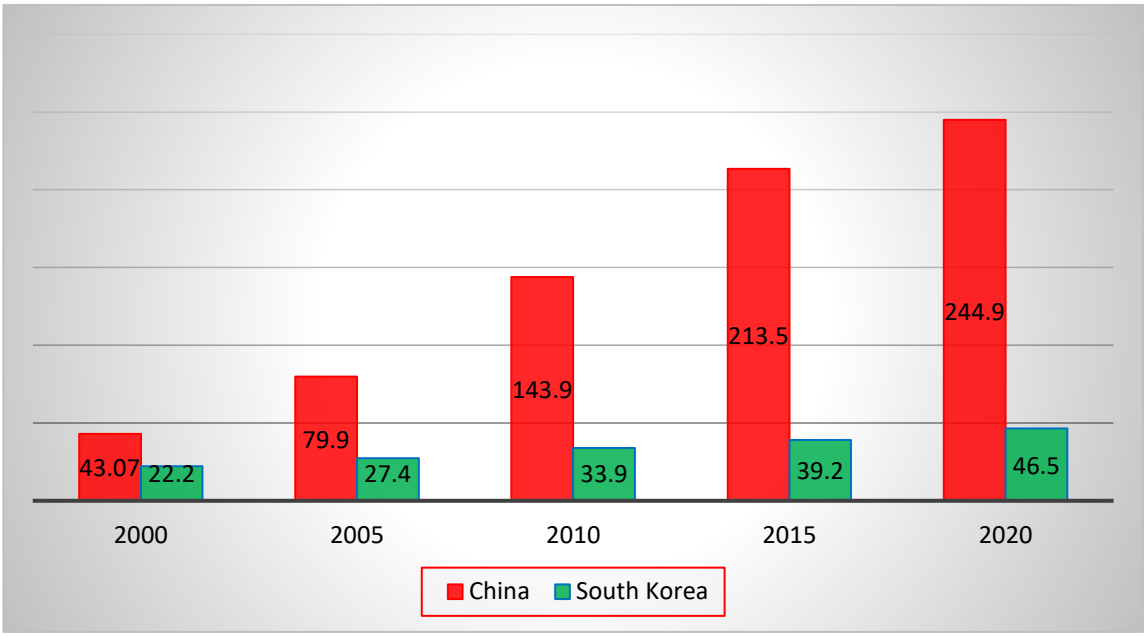

Figure 12: China vs. South Korea defense expenditure ($US Billion) SIPRI

Economically, trade between states is growing once again, as economies begin to open up after the global Coivd-19 Pandemic. In 2020, China was South Korea's largest trading

[1606] Park Chan-kyong, "Hundreds of illegal Chinese fishing boats are taking our catches: South Korea," *SCMP*, May 26, 2021, accessed February 4, 2022, https://www.scmp.com/week-asia/politics/article/3134821/hundreds-illegal-chinese-fishing-boats-are-taking-our-catches; Hyonhee Shin, "S. Korea scrambles fighter jets as China, Russia aircraft enter air defense zone," *Reuters*, November 19, 2021, accessed February 4, 2022, https://www.reuters.com/world/skorea-scrambles-fighter-jets-china-russia-aircraft-enter-air-defense-zone-2021-11-19/

[1607] "Military expenditure by country, in constant (2019) US$ m., 1988-2020" © SIPRI 2021, accessed October 7, 2021, https://sipri.org/sites/default/files/Data%20for%20all%20countries%20from%201988%E2%80%932020%20in%20constant%20%282019%29%20USD%20%28pdf%29.pdf

partner, whereas South Korea was China's fifth-largest trading partner.[1608] In 2020, China's exports to South Korea accounted for $112.5 billion, and South Korean exports accounted for $132 billion.[1609] In 2019 China's exports to South Korea were $112 billion, and South Korea's exports to China were $116 billion.[1610] Notwithstanding the growing economic trade, China's policymakers were aware of the emerging political change due to China's economic and political rise. Perhaps that is why Beijing was unwilling to give up on the *China-North Korea Treaty of Friendship, Co-operation and Mutual Assistance* (first signed in 1961 and renewed for twenty years in 1981, 2001, and 2021), with Pyongyang being opposed to North Korea's nuclear program and having dubious a pro-UN sanctions stance.[1611] As Anny Boc writes,

> On the one hand, it [the China-North Korea Treaty of Friendship, Co-operation and Mutual Assistance] is regarded as an instrument serving China's interests in preserving security and stability in the region. The formal alliance with its Communist neighbour functions as a deterrent against the United States' seeking regime change in North Korea by military means. On the other hand, it allows Beijing to maintain its influence and leverage over Pyongyang.[1612]

In recent years, precision-guided strike capabilities and strategies have gained pre-eminence in South Korean policymaking circles as they are gaining importance in Japan.[1613] South Korean military strategy vis-à-vis North Korea is based mainly on two military doctrines: the Kill Chain and Korea Massive Punishment and Retaliation. Though designed against North Korea, these doctrines are equally applicable against China.[1614]

[1608] "South Korea Exports to China" *Trading Economics*, accessed January 31, 2022, https://tradingeconomics.com/south-korea/exports/china; China Exports to South Korea, *Trading Economics*, accessed January 31, 2022, https://tradingeconomics.com/china/exports/south-korea

[1609] Huo Jianguo, "Cooperation with China crucial to the South Korean economy," *Global Times*, August 4, 2020, accessed November 15, 2020, https://www.globaltimes.cn/content/1196686.shtml

[1610] Ibid

[1611] Khang Vu, "Why China and North Korea decided to renew a 60-year-old treaty," *The Interpreter*, July 30, 2021, accessed January 31, 2022, https://www.lowyinstitute.org/the-interpreter/why-china-and-north-korea-decided-renew-60-year-old-treaty; Monet Stokes, "North Korea Doesn't Trust China to Protect It," *Foreign Policy*, August 25, 2020, accessed November 15, 2020, https://foreignpolicy.com/2020/08/25/north-korea-china-nuclear-umbrella-denuclearization-kim-jong-un/

[1612] Anny Boc, "Does China's 'Alliance Treaty' With North Korea Still Matter?" *The Diplomat*, July 26, 2019, accessed November 12, 2020, https://thediplomat.com/2019/07/does-chinas-alliance-treaty-with-north-korea-still-matter/

[1613] "Missiles of South Korea," *Missile Threat*, accessed November 14, 2020, https://missilethreat.csis.org/country_tax/south-korea/

[1614] Caleb Larson, "Kill Chain and Massive Punishment and Retaliation: South Korea's Plan for War with North Korea," *The National Interest*, July 28, 2020, accessed November 15, 2020, https://nationalinterest.org/blog/korea-watch/kill-chain-and-massive-punishment-and-retaliation-south-korea%E2%80%99s-plan-war-north

7.6.1 **Kill Chain**

Kill Chain is a strategy based on early detection and followed by pre-emptive strikes to eliminate an imminent threat.[1615] The strategy relies mainly on the ISR capabilities of South Korea, which continuously monitors emerging developments in North Korea and China.[1616] If the ISR assessment indicates that North Korea is preparing to launch military strikes, Kill Chain will pre-empt those military installations, particularly North Korea's missile and long-range bases.

7.6.2 **Korea Massive Punishment and Retaliation (KMPR)**

KMPR is a strategy with a broad scope. KMPR includes Kill Chain and is likely to be implemented following a massive conventional or nuclear attack from North Korea. It further aims to prompt regime change by eliminating the political and military leadership of North Korea. Quoting Yonhap, a news agency from South Korea, the *Stuff* newspaper notes that according to a military official,

> Every Pyongyang district, particularly where the North Korean leadership is possibly hidden, will be destroyed by ballistic missiles and high-explosive shells as soon as the North shows any signs of using a nuclear weapon.[1617]

Without the political and first-tier military leadership, the perceived outcome of the war would unlikely favor North Korea. Apart from being a deterrent against North Korea, KMPR is designed to deter other adversaries, notably China. Though South Korea cannot defeat China in a conflict war, the limited efficacy of advanced precision-guided conventional strikes cannot be ignored.[1618] Moreover, the South Korean missile defense program may be likely to have anti-access area denial (A2/AD) implications for possible Chinese aggression against South Korea.[1619] Additionally, the advanced conventional capabilities may help South Korea hedge to support nuclear latency.[1620] Furthermore, the South Korean BDM system, built in alliance with the US, is the by-product of insecurity from China and North Korea.

[1615] Ibid
[1616] Ibid
[1617] "South Korea draws up plan to destroy Pyongyang," *Stuff*, September 11, 2016, accessed November 14, 2020, https://www.stuff.co.nz/world/asia/84146158/south-korea-draws-up-plan-to-destroy-pyongyang
[1618] Ian Bowers and Henrik Stålhane Hiim, "Conventional Counterforce Dilemmas: South Korea's Deterrence Strategy and Stability on the Korean Peninsula," *International Security*, Vol. 45, No. 3(2021), 7-39
[1619] Ibid
[1620] Bowers and Stålhane Hiim, "Conventional Counterforce Dilemmas"

7.6.3 **The South Korea-US Alliance**

In 1953, The Mutual Defense Treaty between the United States of America and the Republic of Korea was signed.[1621] The treaty led to the establishment of mutual security and defense zones. In the case of an attack on either state, treaty parties are bound to act mutually to meet the challenge. South Korea allowed the US to station its forces on South Korean territory to fulfil part of its treaty obligations.[1622] Under the treaty, the US deployed nuclear weapons on South Korean territory from 1958 to 1991.[1623] The deployment of nuclear weapons was to deter North Korea from attacking South Korea, and to some extent, deter Communist China and Russia from aiding North Korean communists and to ensure North Korea did not seek to reunify the peninsula under its control.[1624] The US viewed nuclear weapons as a cost-effective solution. According to some recently US DoD declassified documents, the US Defense Department and Budget Bureau believed that "early introduction of nuclear weapons will enable us to make substantial economies in our financial commitments in Korea."[1625]

In the latter half of the 1960s, US had eight different types of nuclear weapons stationed in South Korea, and the highest number of nuclear weapons the US had in South Korea was 950 in 1967.[1626] Since then, the number of US nuclear weapons has declined, and in 1990, the number declined to approximately 100.[1627] The following year, President George H.W. Bush, in an address to the nation, announced the US decision to "eliminate its entire worldwide inventory of ground-launched, short-range, that is, theater nuclear weapons. We will bring home and destroy all of our nuclear artillery shells and short-range ballistic missile warheads."[1628] Since the withdrawal of nuclear weapons, the US

[1621] "The Mutual Defense Treaty Between the United States of America and the Republic of Korea, October 1, 1953," *Yale Law School,* accessed November 15, 2020, https://avalon.law.yale.edu/20th_century/kor001.asp
[1622] Ibid
[1623] Hans M. Kristensen and Robert S. Norris, "A history of US nuclear weapons in South Korea," *Bulletin of the Atomic Scientists*, Vol. 73, No. 6 (2017), 349
[1624] Ibid
[1625] William Burr, "The First Nukes on the Korean Peninsula," *National Security Archives*, November 20, 2019, accessed February 1, 2022, https://nsarchive.gwu.edu/briefing-book/nuclear-vault/2019-11-20/first-nukes-korean-peninsula
[1626] Kristensen and Norris, "A history of US nuclear weapons in South Korea"
[1627] Ibid
[1628] George H. W. Bush, "Address to the Nation on Reducing United States and Soviet Nuclear Weapons," *The American Presidency Project*, September 27, 1991, accessed November 15, 2020, https://www.presidency.ucsb.edu/documents/address-the-nation-reducing-united-states-and-soviet-nuclear-weapons

has provided allies such as South Korea and Japan with a nuclear umbrella based on strategic bombers, and submarines based in Hawaii and Guam.[1629]

The 1953 mutual defense treaty provides the basis for US forces stationed in South Korea. In 1966, both states signed the Status of Forces Agreement, codifying rules and regulations for US forces stationed in South Korea. Under US Force Korea (USFK), the US currently has 28,500 troops in South Korea to support South Korean defense.[1630] According to the recent (2018) Defense White Paper of South Korea, the USFK also possesses approximately 90 fighter aircraft, 40 attack helicopters, and eight Patriot missile defense batteries.[1631] In addition, USFK has a single THAAD battery[1632] comprised of a minimum of six truck-mounted launchers, each carrying up to eight interceptor missiles.[1633]

South Korea operates its own Korean Air and Missile Defense (KAMD) system based on eight Patriot Advanced Capability-2 (PAC-2) and PAC-3 batteries.[1634] KAMD involves short, medium and long-range SAMs.[1635] It possesses three Aegis destroyers (Baseline 7 version that is not BMD capable), and it plans to build three (Baseline 9, BMD capable)

[1629] Ken Moriyasu, "Amid Ukraine crisis, U.S. reminds China nuclear-armed sub is close," *NIKKEI Asia*, January 26, 2022, accessed February 2, 2022, https://asia.nikkei.com/Politics/International-relations/Indo-Pacific/Amid-Ukraine-crisis-U.S.-reminds-China-nuclear-armed-sub-is-close; Barbara Starr and Brad Lendon, "US sends message to adversaries with nuclear sub visit, drills," CNN, November 1, 2016, accessed February 2, 2022, https://edition.cnn.com/2016/10/31/politics/guam-nuclear-missile-submarine-visit/index.html; Brad Lendon, One of the US Navy's most powerful weapons makes a rare appearance in Guam," *CNN*, January 17, 2022, accessed February 2, 2022, https://edition.cnn.com/2022/01/16/asia/us-navy-ballistic-missile-submarine-guam-intl-hnk-mi/index.html; "US, Japan bomber-fighter integration showcases alliance, global power projection," *Pacific Air Forces Public Affairs, News*, February 5,2020, accessed February 2, 2022, https://www.stratcom.mil/Media/News/News-Article-View/Article/2075611/us-japan-bomber-fighter-integration-showcases-alliance-global-power-projection/

[1630] Hyonhee Shin and Joyce Lee, "Factbox: U.S. and South Korea's security arrangement, cost of troops," *Reuters*, March 8, 2021, accessed February 2, 2022, https://www.reuters.com/article/us-southkorea-usa-alliance-idUSKBN2AZ0S0

[1631] 2018 Defense White Paper, accessed November 15, 2020, https://www.mnd.go.kr/cop/pblictn/selectPublicationUser.do?siteId=mndEN&componentId=51&categoryId=0&publicationSeq=846&pageIndex=1&id=mndEN_031300000000; Michael Elleman, "North Korea's Short-Range Ballistic Missiles: They Can't "Evade Detection" and Are Still Vulnerable to Interception," *38 North*, October 2, 2020, accessed March 4, 2021, https://www.38north.org/2020/10/melleman100220/

[1632] "THAAD on the Korean Peninsula," *Institute for Security and Development Policy*, October 2017, https://isdp.eu/publication/korea-thaad/

[1633] Dan Lamothe, "U.S. military deploys advanced defensive missile system to South Korea, citing North Korean threat," *The Washington Post*, March 7, 2017, accessed November 15, 2020, https://www.washingtonpost.com/news/checkpoint/wp/2017/03/06/u-s-military-deploys-advanced-defensive-missile-system-to-south-korea-citing-north-korean-threat/

[1634] Kingston Reif, "U.S. and Allied Ballistic Missile Defenses in the Asia-Pacific Region," *Arms Control Association*, January 2019, accessed March 4, 2021, https://www.armscontrol.org/factsheets/us-allied-ballistic-missile-defenses-asia-pacific-region

[1635] Reif, "U.S. and Allied Ballistic Missile Defenses in the Asia-Pacific Region"

more by 2027, which will be equipped with SM-3 missile interceptors.[1636] It also aims to upgrade the existing three Aegis destroyers (Baseline 7) with its new version (Baseline 9).[1637] South Korea and the US share the cost of the US military presence in South Korea. The US demanded a five-fold increase during the Trump administration, with the president stating US support was "$5 billion worth of protection".[1638] Following the US demands, as per the recent agreement signed in February 2019 for a year, South Korea approved an approximately $70.3 million increase to the previous cost, making the total $927 million in lieu of military payments to the US.[1639]

7.6.3.1 Alliance Security Dilemma: The US and South Korea

As discussed previously in Chapter One, in alliance politics, states trade off security for autonomy. By forming an alliance, an ally may maximize security but inevitably minimize autonomy by alliance formulation, and weaker states are vulnerable to the risk of abandonment and entrapment.[1640] Snyder viewed three types of possible abandonment: an ally may revoke an alliance treaty or agreement; an ally may decide to follow neither a treaty or agreement, abrogate it; and lastly, an ally may willingly withhold support in a circumstance where it was required. [1641] Entrapment, on the other hand, is the danger of an ally being drawn into "conflict over an ally's interests that one does not share, or shares only partially."[1642] There is an inverse relationship between the risk of abandonment and entrapment and, according to Snyder, it can lead to an alliance security dilemma, measures to decrease the risk of entrapment increases the risk of abandonment and vice-versa.[1643] Snyder examines the degree of alliance security dilemma from three levels: mutual interest, asymmetric dependence, and commitment.[1644]

Applying these postulates of the alliance security dilemma to the US-South Korea alliance reveals that the alliance has been experiencing a high-level security dilemma in recent years. There are several reasons for this. In general, South Korea and the US do not share

[1636] Ibid
[1637] Ibid
[1638] "Factbox: U.S. and South Korea's security arrangement, cost of troops, November 13, 2019," accessed November 15, 2020, https://www.reuters.com/article/us-southkorea-usa-military-factbox-idUSKBN1XN09I
[1639] Ibid
[1640] Glenn H. Snyder, "The Security Dilemma in Alliance Politics," *World Politics,* Vol. 36, No. 4, (1984) 461-495; for more details Glenn H. Snyder, *Alliance Politics* (Ithaca: Cornell University Press, 1997)
[1641] Snyder, "The Security Dilemma," 466-468
[1642] Ibid, 467
[1643] Glenn H. Snyder, *Alliance Politics* (Ithaca: Cornell University Press, 1997), 185-186
[1644] Snyder, "Security Dilemma," 471-477; Ibid, 186-192

a mutual interest in the latter's objective of counter-balancing China. South Korea has territorial disputes with China, but these disputes are not as significant as Japan-China disputes.[1645] Politically, South Korea recognizes that it requires China's support to settle issues, such as de-nuclearisation or reunification of Korea with North Korea. These circumstances place South Korea in a position where the cost to counter and antagonize China outweighs the benefits. Secondly, being an alliance member, South Korea is asymmetrically dependent on the US for its defense because it does not have a military large enough to balance the US contribution to the alliance. The US's military capabilities are vastly superior to South Korea, and the latter's military capabilities are not sufficient to defend itself from North Korea; it needs US support.[1646] This enhances South Korea's level of dependence on its US ally for security.

Lastly, the US-South Korea alliance makes explicit commitments regarding the North Korean nuclear threat. Being dependent on an alliance partner, South Korea's fear of entrapment could motivate it to abandon the alliance. Perhaps this is why South Korea is demanding the redeployment of nuclear weapons to South Korea. It is also on track to take full wartime operational control of the South Korean armed forces from the US.[1647] Therefore, the risk of abandonment runs high. For instance, in 1968, the US restrained South Korea from responding aggressively to a North Korean army raid, which almost reached President Park Chung-hee's residence.[1648] A few days after the incident, the North Korean Navy seized the USS Pueblo , which led Washington to negotiate for the release of the USS vessel with Pyongyang. The following year, 1969, the North Korean military shot down a US Navy reconnaissance plane, killing all thirty-one crew on board.[1649] The US avoided military confrontation with North Korea and resumed

[1645] Alexandra Sakaki and Junya Nishino, "Japan's South Korea Predicament." *International Affairs*, Vol. 94, No. 4, (2018), 743-748

[1646] Tom Porter, "How Does U.S. Military Compare to North and South Korea? Washington and Seoul Suspend Exercises," *News Week*, June, 18, 2018, accessed February 2, 2022, https://www.newsweek.com/how-does-us-military-compare-north-and-south-korea-washington-and-seoul-980656; Mohammed Haddad and Alia Chughtai, "Infographic: North Korea, South Korea missile programmes compared," *Aljazeera*, September 16, 2021, accessed February 2, 2022, https://www.aljazeera.com/news/2021/9/16/infographic-missile-programmes-north-korea-v-south-korea-interactive

[1647] Brian W. Everstine, "US, South Korea Prepare for Transfer of Wartime Operational Control," *Air Force Magazine*, March 18, 2021, accessed February 14, 2022, https://www.airforcemag.com/us-south-korea-prepare-for-transfer-of-wartime-operational-control/

[1648] Clint Work and Daniel A. Pinkston, "New Realities, Old Fears: Escalation on the Korean Peninsula, *The Diplomat*," January 28, 2016, accessed February 2, 2022, https://thediplomat.com/2016/01/new-realities-old-fears-escalation-on-the-korean-peninsula/

[1649] Ibid

reconnaissance flights operations. Amidst these crises, the US reluctance to retaliate militarily against the North Korean regime infuriated President Park and created significant rifts in the alliance. This made Park apprehensive at the US, saying that "the U.S. government might abandon South Korea if it was necessary for the sake of Washington's broader strategic interests."[1650] More importantly, the fear of abandonment led Park to launch a top-secret nuclear weapons program (Project 890) in the early 1970s. The fall of South Vietnam in 1975 raised Seoul's concerns over the credibility of the alliance and increased Park's resolve for securing an independent nuclear deterrent. [1651]

More recently, the Trump administration demanded $5 billion, a 500 percent increase over South Korean 2019 contribution, to share the cost burden of hosting US troops, another indication of entrapment.[1652] It is also this fear of entrapment that is making South Korea reluctant to join the US and Japan in a regional BMD system.[1653] Instead, it prefers to host two BMD systems independent of each other; one run by the South Korean military and the other (THAAD) run by USFK.[1654]

The figure also reveals that in recent years South Korea's percentage increase in defense expenditure has been continuously growing. Though the percentage growth in China's defense expenditure compared to South Korea since 2010 has not changed much, the growing GDP of China has multiplied its total defense budget from $143.9 billion in 2010

[1650] Se Young Jan, "The Evolution of US Extended Deterrence and South Korea's Nuclear Ambitions," *Journal of Strategic Studies*, Vol. 39 (2016), 502-520; Lyong Choi, "The First Nuclear Crisis in the Korean Peninsula, 1975-76," *Cold War* History, Vol. 14 (2014), 71-90.
[1651] Ibid
[1652] Anthony Kuhn, "U.S. And South Korea Negotiate Cost-Sharing Deal Of U.S. Military Presence," *NPR*, March 5, 2020, accessed March 5, 2021, https://www.npr.org/2020/03/05/812644970/u-s-and-south-korea-negotiate-cost-sharing-deal-of-u-s-military-presence
[1653] "Advancing South Korean Capabilities for the Future: Procurement or Research and Development?" *CFR*, March 4, 2020, accessed February 2, 2022, https://www.cfr.org/blog/advancing-south-korean-capabilities-future-procurement-or-research-and-development; Tae-Hyung Kim, "South Korea's missile defense policy: Dilemma and opportunity for a medium state," *Asian Politics and Policy*. Vol. 1, No. 3 (2009), 377-378; Joshua H. Pollack, "Ballistic Missile Defense in South Korea: Separate Systems Against a Common Threat, (paper in) Catherine Kelleher ed. Missile Defense, Extended Deterrence, and Nonproliferation in the 21st Century, *Center for International and Security Studies*, January 2017, accessed February 3, 2022, https://cissm.umd.edu/sites/default/files/2019-07/Missile%20Defense%2C%20Extended%20Deterrence%2C%20and%20Nonproliferation%20in%20the%2021st%20Century%20-%20Full.pdf
[1654] Catherine McArdle Kelleher, "Missile Defense, Extended Deterrence, and Nonproliferation in the 21st Century," Naval Postgraduate School Institutional Archives, July 2016, accessed March 5, 2021, https://calhoun.nps.edu/bitstream/handle/10945/50379/Kelleher%20-%20Missile%20Defense%20and%20Extended%20Deterrence%20-%20PASCC%20Final%20Report%20.pdf?sequence=1&isAllowed=y

to $244.9 billion in 2020.[1655] In comparison, the South Korean defense budget has grown from $33.9 billion in 2010 to $46 billion in 2020.[1656]

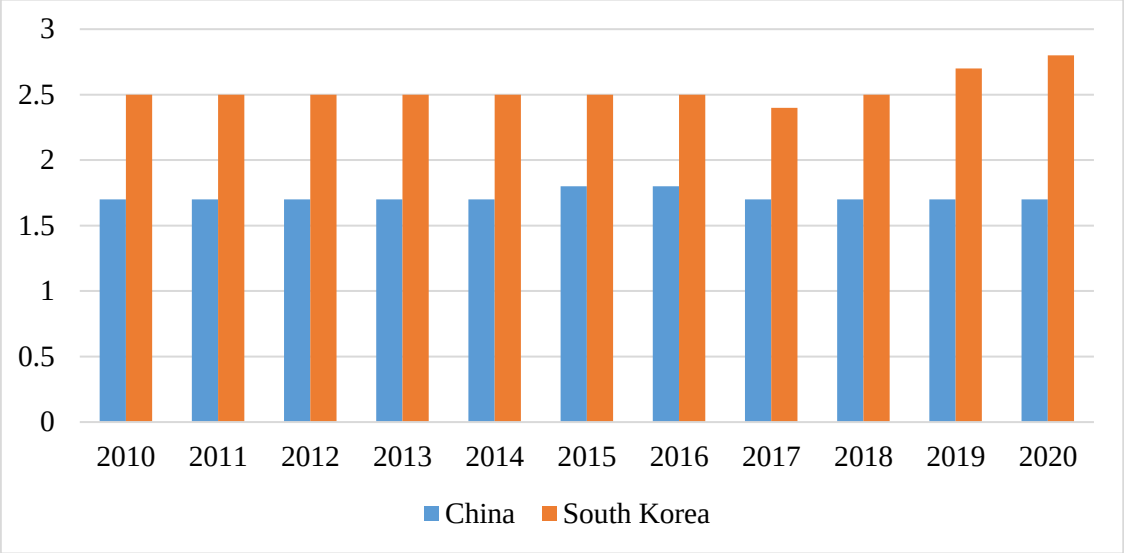

Figure 13: Military expenditure of China and South Korea as a percentage of GDP, 2010-2020

The percentage increase in the defense budget of South Korea in the figure above also suggests that South Korea is shifting towards greater self-reliance. According to the South Korean MoD report, for "securing military response capability against threats from all directions," it aims for "securing response capability to nuclear and other weapons of mass destruction."[1657] This capability, according to one analyst, includes "F-35A aircraft, military satellites, Jang-Bogo III submarines, Gwanggaeto-class destroyers, early warning radar for ballistic missiles, ship-to-air and surface-to-surface guided missiles, and improving the performance of Patriot Missiles."[1658] It is also noted that the increased budget is "evidence of the Moon administration's push to gain operational wartime control from the U.S. military before the end of Moon's term."[1659]

[1655]" Military expenditure by country as percentage of gross domestic product, 1988-2020" (see below for 2005-2020) © *SIPRI 2021*, accessed October 7, 2021, https://sipri.org/sites/default/files/Data%20for%20all%20countries%20from%201988%E2%80%932020%20as%20a%20share%20of%20GDP%20%28pdf%29.pdf

[1656] Ibid

[1657] "Korea-US joint exercises will be coordinated and implemented by the Ministry of Defense to report to President Moon," *Younhap News Agency*, January 21, 2020, accessed February 3, 2022, https://jp.yna.co.kr/view/AJP20200121004000882?section=politics/index; Kohtaro Ito, "What to Make of South Korea's Growing Defense Spending," *The Sasakawa Institute for Peace*, March 12, 2020, accessed February 3, 2022, https://www.spf.org/iina/en/articles/ito_02.html

[1658] Kohtaro Ito, "What to Make of South Korea's Growing Defense Spending,"

[1659] Ibid

Overall, these scenarios highlight that the alliance security dilemma between the US and South Korea has grown over time, and the Trump administration has acted as the catalyst. Trump made clear to South Korea and Japan that he did not understand the value of alliances with them for the US and suggested they develop their own nuclear weapons.[1660] He pushed South Korea to increase their payments in support of the mutual military alliance fivefold, to $5 billion.[1661] He also claimed that the US-Korea Free Trade Agreement (KORUS FTA) is unjust and a reason for job losses in the US, and forced South Korea to renegotiate FTA, and charged it by imposing levies on major exports. [1662]

However, the alliance remains intact, and under the Biden administration, it is likely to grow. Biden is trying to secure South Korea's "full and sustained" participation in QUAD.[1663] The joint statement after the U.S.-ROK summit in Washington in May 2021 stressed US' unwavering commitment to South Korean defense.[1664] It was the first time that the joint statements emphasized "the importance of maintaining an open and secure

[1660] "Transcript: Donald Trump Expounds on His Foreign Policy Views," *The New York Times*, March 26, 2016, accessed January 29, 2022, https://www.nytimes.com/2016/03/27/us/politics/donald-trump-transcript.html?smid=tw-nytpolitics&smtyp=cur&_r=0; Troy Stangarone, "Is Trump Right to Suggest that South Korea and Japan Should Go Nuclear?" *Korea Economic Institute of America*, accessed February 2, 2022, https://keia.org/the-peninsula/is-trump-right-to-suggest-that-south-korea-and-japan-should-go-nuclear/

[1661] "Factbox: U.S. and South Korea's security arrangement, cost of troops," *The Reuters*, November 13, 2019, accessed December 21, 2020, https://www.reuters.com/article/us-southkorea-usa-military-factbox-idUSKBN1XN09I; Gordon Lubold and Andrew Jeong, "Trump Wants South Korea to Pay More for U.S. Troop Presence," *The Wall Street Journal*, December 7, 2018, accessed February 3, 2022, https://www.wsj.com/articles/trump-wants-south-korea-to-pay-more-for-u-s-troop-presence-1544221727; Park Ji-Won, "Cost for US troops to rise 8.2%," *The Korea Times*, February 10, 2019, accessed February 3, 2022, https://www.koreatimes.co.kr/www/nation/2019/02/205_263407.html; Clint Work, "Beyond North Korea: Fractures in the US-South Korea Alliance," *The Diplomat*, February 11, 2020, available at https://thediplomat.com/2020/02/beyond-north-korea-fractures-in-the-us-south-korea-alliance/

[1662] Ana Swanson, "Trump's Trade Plan Threatens to Derail Korean Security Talks," *The New York Times*, March 6, 2018, accessed February 3, 2022, https://www.nytimes.com/2018/03/06/us/politics/trumps-trade-south-korea.html; Michelle Ye Hee Lee, "Trump wants to end 'horrible' South Korea-U.S. trade deal. Koreans disagree," *The Washington Post*, September 14, 2017, accessed February 3, 2022, https://www.washingtonpost.com/world/trump-wants-to-end-horrible-south-korea-us-trade-deal-koreans-disagree/2017/09/13/fb528b3e-9627-11e7-a527-3573bd073e02_story.html; Stephen J. Adler, Jeff Mason, and Steve Holland, "Exclusive: Trump vows to fix or scrap South Korea trade deal, wants missile system payment," *Reuters*, April 27, 2017, accessed February 3, 2022, https://www.reuters.com/article/us-usa-trump-southkorea-exclusive/exclusive-trump-vows-to-fix-or-scrap-south-korea-trade-deal-wants-missile-system-payment-idUSKBN17U09M; Damian Paletta, "Trump preparing a withdrawal from south Korea trade deal, a move opposed by top aides," *The Washington Post*, September 2, 2017, accessed February 3, 2022, https://www.washingtonpost.com/news/wonk/wp/2017/09/02/trump-plans-withdrawal-from-south-korea-trade-deal/

[1663] Chung Min Lee, "Moon and Biden Must Revamp the U.S.-South Korea Alliance," *CEIP*, May 21, 2021, accessed February 3, 2022, https://carnegieendowment.org/2021/05/21/moon-and-biden-must-revamp-u.s.-south-korea-alliance-pub-84590

[1664] Chung Min Lee, "Is South Korea Going Global? New Possibilities Together With the Biden Administration," *Korea Strategic Review, CEIP*, accessed February 4, 2022, https://carnegieendowment.org/files/2021KSR_FINAL_Updated.pdf

Indo-Pacific and security in the Taiwan Strait."[1665] Both states also decided to collaborate against cyber attacks.[1666]

In short, China's growing maritime assertiveness in the SCS, particularly in areas under South Korean legal jurisdiction, violation of South Korean ADIZ, its economic coercion, and political and military support of North Korea reflects that the security dilemma between China and South Korea in an anarchic international system is more significant than it exists in the US-South Korea alliance, which, if it collapsed, would have severe security implications.

7.6.4 **South Korea and US Extended Deterrence**

Extended deterrence is a two-way relationship; the state extending deterrence also benefits by preserving the status quo and hegemony at the regional or global level. [1667] Just as they receive benefits, the patron state may also face challenges and costs related to extended deterrence, particularly when a third party possesses nuclear weapons and intends to use them. A scenario involving nuclear war may deter the patron state from being willing to use nuclear weapons to defend their ally; as discussed previously in detail, even US allies like France, under the President, Charles de Gaulle, expressed these concerns and apprehensions. In the US-South Korea alliance, extended deterrence becomes a multi-player game as North Korea also possesses nuclear weapons and a treaty alliance with China. [1668] Furthermore, the US commitment to extended deterrence, particularly in a nuclear war with North Korea and allies such as China, is increasingly questionable because of the US' own security and vulnerability to China's nuclear weapons. While questioning the credibility of US extended deterrence, some South Korean policymakers and analysts have argued for the development of their own indigenous nuclear deterrent capability.[1669]

[1665] Ibid

[1666] Ibid

[1667] Matthew Fuhrmann, "On Extended Nuclear Deterrence," *Diplomacy & Statecraft*, Vol. 29, No. 1, (2018), 52-53; Walter B. Slocombe, "Extended deterrence," *Washington Quarterly*, Vol. 7, No. 4, (1984), 93

[1668] Like the US-South Korea defense treaty, North Korea and China also have a "Treaty of Friendship, Cooperation, and Mutual Assistance," signed in 1961. The treaty calls for collective defense in case of an attack by a third state. Anny Boc, "Does China's 'Alliance Treaty' With North Korea Still Matter?" *The Diplomat*, July 26, 2019, accessed November 15, 2020, https://thediplomat.com/2019/07/does-chinas-alliance-treaty-with-north-korea-still-matter/

[1669] Hong Jeong-gyu, "Is the 'Nuclear Armament Theory' Momentum? The North Korean Nuclear Policy Must Be Fully Reviewed" *Yonhap News*, January 1, 2016, accessed November 16, 2020, https://www.yna.co.kr/view/AKR20160108098551001

Several factors determine the credibility of extended deterrence; equally important is the level of contribution from a client state to preserve the patron state's national interests. For instance, THAAD deployed in South Korea provides strategic advantages and opportunities to the US, such as an extra layer of protection from Chinese and North Korean ICBMs, and thus can assist in increasing US freedom of operations and containment of China's military expansion into the Indo-Pacific region.

According to some analysts, the main purpose of the THAAD deployment was to protect the contiguous US from North Korean ICBMs.[1670] The deployment of the THAAD would enable the US to defend itself by detecting, tracking, and intercepting missiles using THAAD radars based in South Korea. US BMD based in Alaska and California would then intercept the missiles; South Korea's willingness to base THAAD in its territory, which could be the target of North Korean and even a Chinese attack at the outset of a conflict, therefore could play a vital role in a future conflict in which ballistic missiles were fired at the US homeland. South Korea is therefore running a real risk to contribute to US national security interests; a contribution that reifies the alliance. The US can use radars based in South Korea and Japan to detect, and the Aegis destroyer deployed in the Pacific to intercept, ICBMs launched from northern China.[1671]

A conflict between the US and China in the South and the East China Sea, particularly over Taiwan, also appears increasingly plausible after President Xi and China's defense minister's remarks claiming that China could mount a full-scale invasion of Taiwan by 2025.[1672] The US 2018 NPR also indicates the possibility of a limited conflict in this region. It notes, "China's military modernization and pursuit of regional dominance have emerged as a major challenge to U.S. interests in Asia" and, "Our [US] tailored strategy for China is designed to prevent Beijing from mistakenly concluding that it could secure an advantage through the limited use of its theater nuclear capabilities or that any use of

[1670] Jungkun Seo, "THAAD and the qualitative transformation of the Korean peninsula arms race." *Changjakgwa Bipyeong*, Vol. 43, No. 2, 427-431. [In Korean].
[1671] Yung Goh, "The United States' deployment of THAAD which aims at China? Swaying the strategic stability between the United States and China." *Changjakgwa Bipyeong*, Vol. 43, No. 3, 562-563. [In Korean].
[1672] Oriana Skylar Mastro, "The Taiwan Temptation: Why Beijing Might Resort to Force, *Foreign Affairs*, July/August 2021, accessed February 2, 2022, https://www.foreignaffairs.com/articles/china/2021-06-03/china-taiwan-war-temptation; Helen Davidson and Julian Borger, "China could mount full-scale invasion by 2025, Taiwan defence minister says," *The Guardian*, October 6, 2021, accessed February 4, 2022, https://www.theguardian.com/world/2021/oct/06/biden-says-he-and-chinas-xi-have-agreed-to-abide-by-taiwan-agreement; George Liao, "Taiwan official details China's plan to solve Taiwan 'problem' by 2049: US military journal," *Taiwan News*, October 21, 2020, accessed February 4, 2022, https://www.taiwannews.com.tw/en/news/4034891

nuclear weapons, however limited, is acceptable."[1673] The involvement of ICBMs could be employed in the later stage of a conflict over the island. China is concerned that THAAD in South Korea could be a potential threat to a core national interest, to reunify with Taiwan, as the system might hamper China's ability to block or curtail the US military intervention in a conflict over Taiwan. It is imperative to mention here that many analysts agree that Taiwan is one of China's core national interests, and the term "core national interest" was used to highlight the importance of Taiwan for China in November 2009.[1674]

China's anti-access/area denial (A2/AD) military strategy is primarily designed to keep the US forces out of the SCS during a potential conflict with regional states, particularly Taiwan. China's A2/AD is based mainly on the DF-26B with 4,000km range (an anti-ship variant of DF-26 and the DF-21D with 1,450-1,550km range) a variant of the DF-21, explicitly designed to attack ships, also dubbed the "carrier-killer" because, in theory, it could strike US aircraft carriers.[1675] According to the *US Naval Institute* news, the PLA "has sought a missile capability that could make it difficult for the U.S. to operate within the first island chain due to the reach of Chinese missiles."[1676]

The development and deployment of the DF-26B and DF-21D reflect China's focused approach on its military modernization and countering the US naval superiority in the region. Dean Cheng, an expert on China, notes that "from Mao to now [2015], the concept of the active defense has emphasized assuming the strategic defensive while securing the operational and tactical initiative, including pre-emptive actions at those levels if necessary."[1677] Thus, for China, a pre-emptive attack could be conceptualized as part of

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[1673] "The 2018 NPR," 32

[1674] Michael D. Swaine, "China's Assertive Behavior, Part One: On 'Core Interests'" *China Leadership Monitor*, No. 34, 1–25, accessed November 18, 2020, https://carnegieendowment.org/files/CLM34MS_FINAL.pdf; Jinghan Zeng, Yuefan Xiao and Shaun Breslin, "Securing China's core interests: The state of the debate in China," *International Affairs*, Vol. 91, No. 2, (2015), 245-266

[1675] Missile Defense Project, DF-21 (Dong Feng-21 / CSS-5), *Missile Threat*, Center for Strategic and International Studies, April 13, 2016, last modified January 2, 2020, accessed November 19, 2020, https://missilethreat.csis.org/missile/df-21/; Missile Defense Project, DF-26, *Missile Threat*, Center for Strategic and International Studies, January 8, 2018, last modified August 6, 2021, https://missilethreat.csis.org/missile/dong-feng-26-df-26/

[1676] Mallory Shelbourne, "U.S. Admiral: China Can 'Keep Pouring Money' into Anti-Ship Ballistic Missiles," *USNI News*, January 27, 2021, accessed February 4, 2022, https://news.usni.org/2021/01/27/u-s-admiral-china-can-keep-pouring-money-into-anti-ship-ballistic-missiles

[1677] Dean Cheng, "China's Newest Defense White Paper Suggests Fundamental Change in Perspective," July 6, 2015, accessed November 19, 2020, https://www.heritage.org/defense/report/chinas-newest-defense-white-paper-suggests-fundamental-change-perspective; Michael S. Chase and Andrew S. Erickson, "The Conventional Missile Capabilities of China's Second Artillery Force: Cornerstone of Deterrence and Warfighting," *Asian Security*, Vol. 8, No. 2, (2012), 115-137; Michael S. Chase, "Second Artillery in the

strategic defense aimed at preventing a threat against China's sovereignty (Taiwanese independence), and since China considers Taiwan its part, it falls under China's sovereignty.[1678]

In any circumstances involving the US, China would aim to launch a pre-emptive strike against US forces and deployments to push them out of the region and what China calls the "first island chain."[1679] For this purpose and other regional contingencies, China has deployed short and medium-range missile in its northern region, close to South Korea, where the THAAD system is deployed. China is concerned that forward-based THAAD radars make it 51st Base, which hosts as many as six missile units, and most of these units carry DF-21D carrier killers, vulnerable to the US and its allies.[1680] China's deployments reflect that it is aware that the THAAD provides the US with a greater ability to detect and intercept its ballistic missiles in a future Cross-Strait Crisis, and therefore vehemently opposed the introduction of the THAAD in South Korea. [1681]

China also sees THAAD as a key part of the regional missile defense system and one part of the US global BMD system that the US is building against China. The range of THAAD radar can also be increased from 1,000km to 2,000km in four- to eight-hour long procedures involving changes to its operating program.[1682] According to some Chinese experts, this could negatively impact strategic stability as, during peacetime, THAAD radars could be used to accumulate data on China's missiles further inland from the coast. Tong Zhao writes that,

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Hu Jintao Era: Doctrine and Capabilities" in Roy Kamphausen, David Lai and Travis Tanner, eds. "Assessing the People's Liberation Army in the Hu Jintao Era," (Strategic Studies Institute and U.S. Army War College), April 2014, http://ssi.armywarcollege.edu/pdffiles/pub1201.pdf; Roger Cliff, Mark Burles, Michael S. Chase, Derek Eaton, Kevin L. Pollpeter, "Entering the Dragon's Lair: The Implications of Chinese Anti-access Strategies,) *RAND*, accessed November 19, 2020, https://www.rand.org/content/dam/rand/pubs/monographs/2007/RAND_MG524.pdf; "South China Sea: China media warn the US over 'confrontation'," *BBC News*, January 13, 2017, accessed November 19, 2020, https://www.bbc.com/news/world-asia-china-38607235

[1678] Full Text of 2019 Defense White Paper: "China's National Defense in the New Era" (English & Chinese Versions), July 24, 2019, accessed November 19, 2020, https://www.andrewerickson.com/2019/07/full-text-of-defense-white-paper-chinas-national-defense-in-the-new-era-english-chinese-versions/

[1679] Yves-Heng Lim, "Expanding the Dragon's Reach: The Rise of China's Anti-Access Naval Doctrine and Forces," *Journal of Strategic Studies*, Vol. 40, No. 1-2, 146-168; Thomas G. Mahnken, "China's anti-access strategy in historical and theoretical perspective. *Journal of Strategic Studies*," Vol. 34, No. 3, (2011), 299-323

[1680] Sean O'Connor, "PLA Second Artillery Corps," *Air Power Australia*. December 2009, Updated April 2012, accessed November 20, 2020, http://www.ausairpower.net/APA-PLA-Second-Artillery-Corps.html

[1681] Goh, "The United States' deployment of THAAD," 563

[1682] Missile Defense Project, "Terminal High Altitude Area Defense (THAAD)," *Missile Threat*, Center for Strategic and International Studies, June 14, 2018, last modified June 15, 2018, accessed November 20, 2020, https://missilethreat.csis.org/system/thaad/.

> …many Chinese experts believe the radar undercuts China's nuclear deterrence: during peacetime, the radar monitors China's missile tests and collects data on the warheads and decoys of Chinese ICBMs. During wartime, THAAD updates real-time warhead and decoy monitoring information for American homeland missile defense systems deployed in Alaska and California; such information is then analysed and compared with previous data to ensure that interceptor directly hit the real warheads without being confused by decoys, increasing the success rate of interception. The odds are further improved by the advantageous location of the radar. Based in South Korea, it is close enough to enable early detection and warning, which contributes to increased response time for more than one intercept attempt.[1683]

THAAD may give the US military an advantage in the South and the East China Sea and effectively countervail part of China's force modernization. Steven Hildreth, a specialist in the US and Foreign National Security Programs for the Congressional Research Service, explains that "the focus of our rhetoric is North Korea (…) the reality is that we're also looking longer term at the elephant in the room, which is China."[1684] Though South Korea agreed with China not to deploy more batteries of THAAD under Chinese economic pressure in 2017, the US in 2021 upgraded the existing THAAD system.[1685] The deployment of THAAD in South Korea has increased its strategic importance to the US. Increased importance, in turn, increases the US' assurance to South Korea over the credibility of US extended deterrence.

The common threat and asymmetry of military capability between South Korea and the US have put the alliance in an asymmetric position; being a client state, South Korea has to be flexible and adapt to the broader strategic interests of the US. The US, in its efforts to deter and defend against North Korean and Chinese missiles, strongly encouraged South Korea to join it by deploying THAAD given it has a common interest in the same goal. South Korean policymakers, displaying a nuanced understanding of the alliance security dilemma, took a strategic decision to deploy THAAD because the costs of being entrapped in adversarial relations with China were lesser than being abandoned by the US from the alliance. Wedged next to a belligerent nuclear North Korea and China, the

[1683] Tong Zhao, "Perception Gap in the THAAD Dispute: Causes and Solutions," accessed November 20, 2020, https://carnegieendowment.org/files/Perception_Gap_in_the_THAAD_Dispute.pdf
[1684] Adam Entous and Julian E. Barnes, "U.S. Plans New Asia Missile Defenses." *The Wall Street Journal*, August 23, 2012, accessed November 20, 2020, https://www.wsj.com/articles/SB10000872396390444812704577605591629039400
[1685] Elizabeth Shim, "Report: U.S. seeking improvements to THAAD systems, including Korea," *UPI News*, April 30, 2021, accessed October 8, 2021, https://www.upi.com/Top_News/World-News/2021/04/30/South-Korea-THAAD-US-upgrade/7151619786084/

abandonment of South Korea by the US would be the worst outcome for South Koreans.[1686]

The US also sees security cooperation with Japan as vital to mitigate the China threat. In a conflict with China, the cooperation of the US and South Korea would also support Japan's position (irrespective of the political tensions that flare up between Tokyo and Seoul from time to time). Despite there being little chance of a US nuclear strike while providing extended deterrence to Japan (something that experts continue to admit)[1687], the latter remains connected to the alliance, under which the extended deterrence provides reassurance, contributing to extended deterrence. The chapter now turns its attention to considering the implications of China's ongoing nuclear force modernization for Japan; a state that also enjoys US extended nuclear deterrence.

7.7 The durability of the US-South Korea Alliance and China's Pressure

After decades of ups and downs, the US-South Korea alliance has proven its resilience. However, mounting regional security challenges from North Korea and China, and the Trump administration's criticism of allied free-riding in the region, including South Korea in terms of defense cost-sharing, could generate unpredictable results in the long term. As one South Korean analyst asserted in 2019, "if these trends continue, a nuclear South Korea is a question of 'when,' not 'if'."[1688] Some western nuclear non-proliferation analysts argued that South Korea might go nuclear, despite having strong non-proliferation credentials.[1689] The alarmist prophecy may become true if provocation from

[1686] Jennifer Lind and Daryl G. Press, "Should South Korea Build Its Own Nuclear Bomb?" *The Washington Post*, October 7, 2021, accessed February 5, 2022, https://www.washingtonpost.com/outlook/should-south-korea-go-nuclear/2021/10/07/a40bb400-2628-11ec-8d53-67cfb452aa60_story.html; Michael J. Mazarr, Gian Gentile, Dan Madden, Stacie L. Pettyjohn and Yvonne K. Crane, *The Korean Peninsula: Three Dangerous Scenarios* (Santa Monica, CA: RAND Corporation, 2018), https://www.rand.org/pubs/perspectives/PE262.html; William Gallo, "How the Afghanistan Withdrawal Looks from South Korea, America's Other 'Forever War,'" *VoA*, August 20, 2016, accessed February 5, 2022, https://www.voanews.com/a/usa_how-afghanistan-withdrawal-looks-south-korea-americas-other-forever-war/6209777.html; Chung Min Lee, "South Korea Is Caught Between China and the United States," *CEIP*, October 21, 2020, accessed February 5, 2022, https://carnegieendowment.org/2020/10/21/south-korea-is-caught-between-china-and-united-states-pub-83019

[1687] Gregory Kulacki, "The Nuclear Deterrence Strategy of the US-Japan Alliance is Failing but Can Be Fixed," *Journal For Peace And Nuclear Disarmament*, Vol. 4, No. 2, (2021), 222-234

[1688] Byong-Chul Lee, "Don't be surprised when South Korea wants nuclear weapons," *Bulletin of Atomic Scientists*, October 23, 2019, accessed November 22, 2020, https://thebulletin.org/2019/10/dont-be-surprised-when-south-korea-wants-nuclear-weapons/

[1689] Lind and Press, "Should South Korea Build Its Own Nuclear Bomb?" Morten Soendergaard Larsen, "Talk of a Nuclear Deterrent in South Korea," *Foreign Policy*, February 28, 2019, accessed February 5, 2022, https://foreignpolicy.com/2021/09/09/south-korea-nuclear-deterrent-north-korea/; Toby Dalton and Ain Han, "Elections, Nukes, and the Future of the South Korea–U.S. Alliance," *CEIP*, October 26, 2020,

North Korea or the threat from China increases, leading the US to withdraw its troops and abandon the alliance. The Biden administration has already issued a statement that it would not support the redeployment of TNWs in South Korea. It is important to note here that South Korea's Deputy National Security Advisor, Cho Tae-yong, visited the US in 2016 and requested the secret redeployment of tactical nuclear weapons.[1690] The request, however, was turned down because of the Obama administration's policy over nuclear weapons proliferation.[1691] Since the former conservative administration's request is no longer a secret, such a request may come again, but this time publically and from a future president. Based on realist self-help and alliance-building approaches, South Korea's two-vector security policy reflects its threat perception that China's nuclear force modernization is severe and growing.

Though South Korean officials appear aware that they are stuck in a grand dilemma; the security dilemma with China and the alliance dilemma with the US, they want to antagonize neither their largest trading partner China nor the US, given it is its security guarantor vis-a-vis China. If US security guarantees appear weak, there is a chance that South Korea may begin to pursue its independent nuclear weapons program. According to some analysts, if South Korea plans to go nuclear, it would take only few months.[1692] A nuclear South Korea would have a domino effect on the region by potentially motivating Japan to go nuclear.[1693]

How far the US will go to uphold the alliances is another question, the answer to which is yet unclear.[1694] However, according to the US 2018 NPR, the US is planning to achieve a limited nuclear warfighting capability suitable for the Indo-Pacific region. This might

accessed February 5, 2022, https://carnegieendowment.org/2020/10/26/elections-nukes-and-future-of-south-korea-u.s.-alliance-pub-83044

[1690] Toby Dalton and Ain Han, "Elections, Nukes, and the Future of the South Korea–U.S. Alliance," October 26, 2020, accessed November 22, 2020, https://carnegieendowment.org/2020/10/26/elections-nukes-and-future-of-south-korea-u.s.-alliance-pub-83044

[1691] Ibid

[1692] Ibid

[1693] "Graham T. Allison: The congenital optimist," *Bulletin of the Atomic Scientists*, Vol. 66, No. 5 (2010), 1-8; Kurt M. Campbell, Robert J. Einhorn, and Mitchell B. Reiss, eds., *The Nuclear Tipping Point: Why States Reconsider Their Nuclear Choices* (Washington, D.C.: Brookings Institution Press, 2004); Ashton B. Carter, Gordon Oehler, Michael Anastasios, Robert Monroe, Keith B. Payne, Robert Pfaltzgraff, William Schneider, and William Van Cleave, "Report on Discouraging a Cascade of Nuclear Weapons States" (Washington, D.C.: International Security Advisory Board, U.S. Department of State, October 19, 2007); Joseph Cirincione, "Asian Nuclear Reaction Chain," *Foreign Policy*, No. 118, (2000), 120-136;

[1694] "Extended Deterrence in the U.S.-ROK Alliance," Interview with Mira Rapp-Hooper, *The National Bureau of Asian Research*, April 28, 2020, accessed February 5, 2022, https://www.nbr.org/publication/extended-deterrence-in-the-u-s-rok-alliance/

help the US maintain deterrence in the region, independent of allies, making deterrence more credible.

7.8 Future of Alliances: South Korea, Japan, and the US

How China's nuclear force modernization affects nuclear and conventional deterrence has become a significant issue in Japan and South Korea. President Trump's rhetoric increased allies' concerns, even though his administration appeared aware of the importance of the US and allies to each other. The 2018 NPR is the cornerstone of the Trump administration, highly appreciated by its allies. The Biden administration has continued with the decisions taken in the 2018 NPR, even though it is not in favor of the first-use nuclear policy, and may revisit it. If revisited, the US allies may take alternative steps; most likely acquiring military capabilities of greater operational independence and potentially aligning their policies to suit China's preferences. At worst, they might even abandon their US alliances.

The following could also transpire. Firstly, states such as Japan and South Korea may demand from the US an announcement that its nuclear deterrent protects them against conventional attack. Secondly, regional allies may call on the US to maintain some kind of nuclear weapons presence, either tactical or strategic, on US military platforms in the allies' territory to signal to China Washington's credibility. South Korean defense minister demanded such deployment in 2017, stating that "it was worth reviewing the redeployment of American tactical nuclear weapons to the Korean Peninsula," and though his comments focused on North Korea, the same missiles would be of immense concern to China given their proximity.[1695] An article in the US National Defense University research journal *Joint Force Quarterly* also argued that the US should share tactical nuclear weapons with South Korea and Japan.[1696] Any such deployment would certainly have implications for China. The development of low-yield nuclear weapons and the

[1695] Anna Fifield, "South Korea's defense minister suggests bringing back tactical U.S. nuclear weapons," *Washington Post*, September 4, 2017, accessed October 9, 2021, https://www.washingtonpost.com/world/south-koreas-defense-minister-raises-the-idea-of-bringing-back-tactical-us-nuclear-weapons/2017/09/04/7a468314-9155-11e7-b9bc-b2f7903bab0d_story.html

[1696] Ryan W. Kort, Carlos R. Bersabe, Dalton H. Clarke, and Derek J. Di Bello, "Twenty-First Century Nuclear Deterrence Operationalizing the 2018 Nuclear Posture Review," *Joint Force Quarterly 94*, 3rd Quarter 2019, 78-79; Kim Dong-hyun, "Article Suggests Nuclear Sharing with Japan, S. Korea to Deter N. Korean Threat," *VOA*, July 30, 2019, accessed October 9, 2021, https://www.voanews.com/a/east-asia-pacific_article-suggests-nuclear-sharing-japan-s-korea-deter-n-korean-threat/6172946.html

development of a new SLCM, according to the 2018 NPR, is perhaps a step in this direction.

Thirdly, there might be a surge in the development of missile defense systems and conventional precision strike capabilities of Japan and South Korea to defend and punish China if it launches a conventional attack. For instance, South Korea is planning to build an Israeli-style Iron Dome BMD system.[1697] On the other hand, Japan signed a $287 million contract for SM-3 Block IIA interceptor missiles in 2021, which was initially part of Japan's canceled Aegis Ashore project.[1698] Currently, Japan operates eight Aegis BMD ships.[1699] Japan is considering the development of what it calls "enemy base strike" capability, and South Korea is operating an indigenous KAMD system.[1700]

Lastly, if they lose faith in US extended deterrence's credibility, Japan or South Korea could launch their indigenous nuclear weapons program, as both states are technologically "latent nuclear powers."[1701] According to some estimates, South Korea can build nuclear weapons in 6 months to 3 years.[1702] Japan can also build nuclear weapons in 6 months to 2 years.[1703] Any such development would undoubtedly have far-reaching consequences for the US; the US-led Indo-Pacific security arrangement, in which Japan and South Korea are major pillars, could collapse. Other small allies in the region might fall prey to domino effects and nuclearize themselves, preferring to center

[1697] Sarah Jeong, "South Korea's Defense Capabilities and Acquisition Programs," *Wilson Center*, August 31, 2021, accessed February 14, 2022, https://www.wilsoncenter.org/blog-post/south-koreas-defense-capabilities-and-acquisition-programs

[1698] Takahashi, "Japan signs USD287 million contract for SM-3 Block IIA interceptor missiles"

[1699] "Navy Aegis Ballistic Missile Defense (BMD) Program: Background and Issues for Congress," *CRS Report*, Updated September 30, 2021, accessed October 10, 2021, https://sgp.fas.org/crs/weapons/RL33745.pdf

[1700] Reif, "U.S. and Allied Ballistic Missile Defenses in the Asia-Pacific Region"

[1701] Brad Roberts, *The Case for U.S. Nuclear Weapons in the 21st Century*, (Stanford, Calif.: Stanford University Press, 2016); also see M. Taylor Fravel and Evan Medeiros, "China's Search for Assured Retaliation: The Evolution of Chinese Nuclear Strategy and Force Structure," *International Security*, Vol. 35, No. 2, (2010) 48-87.

[1702] Zachary Keck and Leon Whyte, "Can South Korea Build a Nuclear Bomb in 6 Months?" *The National Interest*, September 22, 2017, accessed September 23, 2020, https://nationalinterest.org/blog/the-buzz/can-south-korea-build-nuclear-bomb-6-months-22437; also see Rachel Oswald, "If It Wanted To, South Korea Could Build Its Own Bomb," *Pulitzer Center*, April 10, 2018, accessed September 23, 2020, https://pulitzercenter.org/reporting/if-it-wanted-south-korea-could-build-its-own-bomb#:~:text=Hwang%20estimates%20it%20would%20take,including%20building%20some%20necessary%20infrastructure.

[1703] Mark Fitzpatrick, "How Japan Could Go Nuclear," *Foreign Affairs*, October 3, 2019, accessed September 24, 2020, https://www.foreignaffairs.com/articles/asia/2019-10-03/how-japan-could-go-nuclear; also see Patrick Winn, "Japan has plutonium, rockets and rivals. Will it ever build a nuke?" March 14, 2019, accessed September 23, 2020, https://interactive.pri.org/2019/03/japan-nuclear/index.html#:~:text=Estimated%20time%20for%20Japan's%20scientists,bomb%3A%206%20%2D%2012%20months.

their security relations on Japan or South Korea rather than the US. Japan and South Korea, because of their bilateral disputes over the sovereignty of the group of islets called Takeshima in Japanese and Dokdo in Korean, could begin to challenge each other, and amidst these tensions, regional states could be tempted to join China if they felt the US alliance system was in disarray.[1704] A glimpse of this occurred in November 2021, when the dispute "derailed a scheduled joint conference between US, South Korean and Japanese officials in Washington, DC.[1705] Any such scenario will reduce the influence of the US in important sub-regions of the Pacific.

However, if the US further enhances its commitment to allies and extended deterrence by deploying nuclear capability in the allies' territory, it would further deteriorate US-China relations and undermine global nuclear disarmament and nuclear non-proliferation efforts as per realist explanations. According to neoclassical realists, this process of modernization, driven by China's threat perception based on the external strategic environment and China's internal factors, exacerbates the security dilemma in the region. In making itself more secure, China is making itself less secure by alternative the strategy environment for other states that raises their threat perception and compels them to make with force modernization and policy changes that, in turn, make China more vulnerable. Moreover, deteriorating US-China relations would potentially put US and Chinese interests, security, and survival at stake, as discussed in Chapter Six.

7.9 Conclusion

This chapter examined the implications of China's nuclear force modernization for South Korea and Japan. China's ongoing nuclear force modernization has negatively impacted strategic stability, exacerbated security dilemmas, and induced an arms race in the region. As per the realists' framework, both South Korea and Japan, treaty allies of the US, rely on self-help and alliance with the US to balance against China's nuclear threat.

South Korea is modernizing and expanding its indigenous KAMD system. Recently, it successfully tested a SLBM; the only country without nuclear weapons having an SLBM. It is also interested in SSNs and nuclear weapons and enjoys domestic political support for them. Japan is also considering procuring an offensive strike capability after

[1704] "Japan, South Korea territorial dispute derails US press event," *Aljazeera,* November 18, 2021, accessed February 14, 2022, https://www.aljazeera.com/news/2021/11/18/japan-south-korea-territorial-dispute-derails-us-press-event
[1705] Ibid

discarding plans for the Aegis Ashore BMD system. The pro-nuclear lobby is gradually gaining pace in Japan.

In alliance with the US, South Korea is experiencing a security dilemma. South Korea's territorial disputes are less significant with China, and it requires China's political support against a belligerent nuclear North Korea. However, the US is neither willing to return nuclear weapons to South Korea nor to support South Korea's desire to acquire nuclear-powered submarines. Instead, it commits itself explicitly to its security. South Korea is dependent on the US for its defense. Therefore, being dependent on the US, South Korea fears becoming entrapped in its alliance with the US. Demanding the deployment of nuclear weapons, help to build SSNs, and ongoing acquiring of full wartime operational control of its forces suggest this.

Unlike South Korea, Japan appears to be cautiously continuing with the US alliance so far. It shares common strategic interests with the US, such as maintaining the freedom of navigation in the Indo-Pacific, supporting Taiwan independence, and containment of China. Though Japan's military is also small like that of South Korea, the significant level of military capability sharing, including BMD deployments, and more importantly, similar strategic interests help Japan hedge against entrapment.

China's nuclear force modernization has also induced an arms race in the region, and so far, the nature of the arms race is defensive and conventional in the domain. Until recently, Japan, after cancelling the Aegis Ashore BMD, started considering offensive strike capability. Some political leaders have also shown interest in nuclear-powered submarines in Japan.[1706] South Korea's desire for nuclear submarines and demand from the US to redeploy nuclear weapons also reflect emerging strategic instability and an alliance security dilemma. The US reassurances made to allies for their defense and stopping them from nuclear proliferation make China feel insecure. Conversely, if the US drops nuclear assurances or they appear less credible, the latent nuclear allies may become overt nuclear weapons states, making China again insecure. Therefore, regional strategic stability, an arms race, and nuclear proliferation in the future depend upon the level and

[1706] "South Korea presidential contender vows to seek nuclear-powered submarines, months after Australia's AUKUS deal," *The Guardian*, December 30, 2021, accessed February 14, 2022, https://www.theguardian.com/world/2021/dec/30/south-korea-presidential-contender-vows-to-seek-nuclear-powered-submarines-months-after-australias-aukus-deal

pace of China's nuclear force modernization and its expanding strategic interests and territorial claims.

The next chapter focuses on the remaining two case studies, Taiwan and India. These case studies are unique, as, unlike other regional rivals, India is a nuclear weapons state and shares a disputed border with China. Both states have fought a major war and recently have been involved in severe border skirmishes. On the other hand, Taiwan is considered a rogue province, therefore, it is an 'internal matter' in China's view. While Taiwan has informal security relations with the US, the latter appears committed to its security. The lack of formal security relations reflects an element of ambiguity the US wants to maintain given the need to manage strategic relations with China and avoid a war, although US-Taiwan ties have been deepening since the Trump administration and now under the Biden administration.[1707] Both cases require a critical examination to achieve a fuller picture of China's nuclear weapons program's regional security implications.

[1707] Ben Blanchard, "Taiwan-Biden ties off to strong start with invite for top diplomat," *Reuters*, January 21, 2021, accessed June 4, 2021, https://www.reuters.com/article/us-usa-biden-taiwan-idUSKBN29Q01N

Chapter Eight

Chinese Nuclear Modernization: Implications for India and Taiwan

8.1 Introduction

This chapter examines the implications of China's nuclear forces modernization for India and Taiwan. The chapter first examines the case study of India with two objectives: to consider how China's nuclear modernization has affected India, what measures India is taking, and whether it is exacerbating the security dilemma. The chapter then examines the implications of China's nuclear modernization for Taiwan, which is the primary driver of China's general force modernization as Beijing's reunification with China is viewed as the primary national security objective of China. On this, Xi stated in 2021 that "we make no promise to abandon the use of force and retain the option of taking all necessary measures."[1708] The implications for Taiwan are then examined through the prism of the US-Taiwan relations, even though the US does not recognize Taiwan as an independent state but maintains relations through a special Taiwan Relation Act (TRA).

8.2 Implications for India

India is unique among all four case studies because it is a nuclear weapons state, and its nuclear threat perception dates back many decades to when China tested its first nuclear weapons in 1964, after winning a border war with India in 1962. Pakistan's position in India's threat perception matrix was elevated in 1998 after it tested nuclear weapons, following India's 1998 nuclear weapons tests.[1709] In India's threat perception, Pakistan is secondary to China, as most Indian analysts opine that Pakistan is encouraged to challenge India by China, a strategic partner of Pakistan that helped it build nuclear weapons.[1710]

[1708] Teddy Ng, "China Warns of Military Action against Taiwan to Block Relations with US on Eve of American Visit, *SCMP*, April 14, 2021, February 20, 2021, https://www.scmp.com/news/china/diplomacy/article/3129467/china-warns-military-action-against-taiwan-block-relations-us

[1709] "Pakistan, Nuclear," *NTI*, Last Updated: November, 2019, accessed March 7, 2021, https://www.nti.org/learn/countries/pakistan/nuclear/

[1710] William Burr, "China, Pakistan, and the Bomb: The Declassified File on U.S. Policy, 1977-1997" *National Security Archive*, Electronic Briefing Book No. 114, March 5, 2004, accessed February 13, 2021, https://nsarchive2.gwu.edu/NSAEBB/NSAEBB114/index.htm; Happymon Jacob, "China, India, Pakistan and a Stable Regional Order," *European Council for Foreign* Relations, accessed March 9, 2021,

The Sino-India relationship is generally characterized by political engagements followed by the border dispute and war, and sporadic military confrontations, which have become more frequent in recent years. 1711 The nature of this relationship between the states is explored below. Since April 1, 1950, when India established diplomatic relations with China, their relationship has been fraught.[1712] Initially, the states had cordial relations, as then-PM Jawaharlal Nehru and Premier Zhou Enlai together came up with "Five Principles of Peaceful Coexistence" as guiding principles for their foreign policies towards each other in the 1950s, and slogans such as "Hindi Chini Bhai Bhai" (Indians and Chinese are brothers) were expressed.[1713] However, the two countries soon entered into border disputes owing to the unclear demarcation of their 3,488km of borders.[1714]

The roots of the India-Chinese border dispute can be traced back to China's invasion of Tibet in 1950, which led to significant tensions between China and India as the latter had strategic interests in Tibet.[1715] Some Indian analysts, while expressing India's concerns, wrote, "any strong expansionist power, entrenched in Tibet, holds in its hands a loaded pistol pointed at the heart of India."[1716] Based on such concerns, India provided small arms to support the Tibetan government against China.[1717] It appeared in 1958 that the CIA, Chiang Kai-shek's agents, and India were involved in training, financing, and equipping Tibetan rebels in Indian territory, which led to an uprising against China's rule in Tibet in March of 1959.[1718] On August 25, 1959, Indian troops crossed the McMahon

https://ecfr.eu/special/what_does_india_think//analysis/china_india_pakistan_and_a_stable_regional_order; Harsh V. Pant, "China and India: A Rivalry Takes Shape," *Foreign Policy Research Institute*, June 2011, accessed March 9, 2021, https://www.files.ethz.ch/isn/150894/2011_06_china_india-1.pdf; Maneesh Pandeya, "Rattled China takes the Pak Route to needle India, *Sunday Guardian*, August 15, 2020, accessed March 9. 2021, https://www.sundayguardianlive.com/world/rattled-china-takes-pak-route-needle-india

[1711] Zhiqun Zhu, "China-India Relations in the 21st Century: A Critical Inquiry,: *Indian Journal of Asian Affairs*, Vol. 24, No. 1/2, (2011), 1-16

[1712] Mohan Malik, *China and India: Great Power Rivals* (Boulder, CO and London: 2011); "India-China Relations," *Ministry of External Affairs,* accessed March 9, 2021, https://www.mea.gov.in/Portal/ForeignRelation/India-China_Relations.pdf

[1713] Ibid; "The Five Principles of Peaceful Coexistence, The time-tested guideline of China's policy with neighbours" (From Chinese Consulate General in Karachi) July 30, 2014, accessed March 9, 2021, https://www.fmprc.gov.cn/mfa_eng/wjb_663304/zwjg_665342/zwbd_665378/t1179045.shtml

[1714] India's Home Ministry, accessed January 26, 2021, https://www.mha.gov.in/sites/default/files/BMIntro-1011.pdf

[1715] Xuecheng Liu, *The Sino-Indian Border Dispute and Sino-Indian Relations* (Lanham, MD: University Press of America, 1994), 10-12; Mohan Guruswamy and Zorawar Daulet Singh, *India China Relations: The Border Issue and Beyond*, (New Delhi: Viva Books, 2009), 38

[1716] P.C. Chakravarti, *India–China Relations,* (Calcutta: Firma K.L. Mukhopadhyay, 1961).

[1717] John W. Garver, "China's Decision for War with India in 1962," in *New Directions in the Study of China's Foreign Policy* (eds.) Alastair Johnston and Robert Ross (California, Stanford University Press, 2006), 91

[1718] Garver, "Protracted Contest," 60-62

Line and attacked Chinese frontier guards.[1719] It was the first armed clash between the two countries. Later, in the same year, to quell the rebellion, China's PLA forces, while fighting the rebels, clashed with the Indian Army in 1959 at the Tibet-India border.[1720] In April 1960, China's premier Zhou Enlai visited India for talks with Jawaharlal Nehru on border issues, which failed. As a result, India adopted a more aggressive policy in 1961, establishing a military post in the strategically important, but disputed territory, to cut off China's military supply lines. In October 1962, China launched an attack on Indian posts, which led to a full-fledged war in 1962.[1721] Nehru requested US assistance in the shape of military aid. The first US infantry and light artillery shipments reached India on November 3, 1962. However, Nehru asked for much more, including "the immediate delivery of fourteen squadrons of fighter planes and three squadrons of bombers to protect India's cities and lines of communications in the north."[1722] The total US military aid amounted to $65 million.[1723] On November 19, 1962, President Kennedy also dispatched a US aircraft carrier to the Bay of Bengal to show US' resolve.[1724] However, the US withdrew its support after China unilaterally announced a ceasefire on November 20, 1962, and withdrew its forces behind the McMahon line, a border accepted by India as a formal border with China, but never formally accepted by China.[1725] A month-long war ended in the humiliating defeat of the Indian army at the hands of the PLA. More than 8,000 Indian soldiers were killed, wounded, or captured, whereas China had 2,000 causalities.[1726] Since the 1962 India-China war, the Western sector (Ladakh), the Central Sector (Doklam Plateau), and the Eastern sector (Arunachal Pradesh) have been disputed as each state has claims over the other's territory along the border.

[1719] Larry M. Wortzel, "Concentrating Forces and Audacious Action: PLA Lessons from the Sino-Indian War," in Laurie Burkitt, Andrew Scobell Larry M. Wortzel, eds. *The Lessons of History: The Chinese People's Liberation Army At 75* (Strategic Studies Institute, U.S. Army War College, 2003), 331
[1720] Ibid.: Malone and Mukherjee, India and China: Conflict and Cooperation, 137-158
[1721] T. V. Paul, ed. *The China-India Rivalry in the Globalisation Era* (Washington, DC: Georgetown University Press, 2018); Jeff M. Smith, *Cold Peace: China-India Rivalry in the Twenty-First Century*, (Lanham: Lexington Books, 2014)
[1722] Chester Bowles, *Promises to Keep: My Years in Public Service,* (New York: Harper & Row, 1971), 474
[1723] Theodore C. Sorensen, *Kennedy*, (New York: Harper & Row, 1965), 663-665
[1724] Ibid
[1725] Jacob Abadi, "The Sino-Indian conflict of 1962: A test case for India's policy on non-alignment," *Journal of Third World Studies*, Vol. 15, Issue. 2 (1998), 11-29
[1726] Wortzel, "Concentrating Forces and Audacious Action," 327

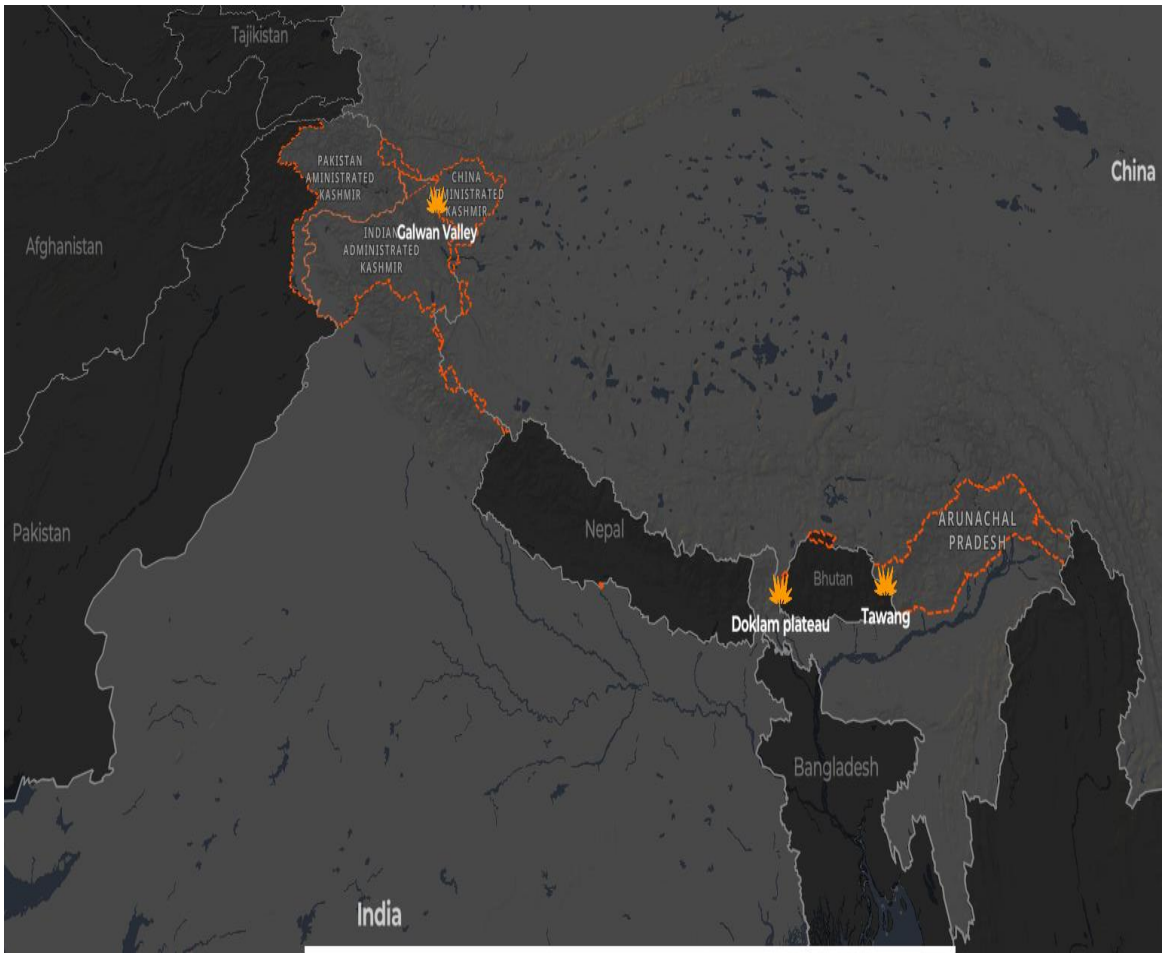

Figure 14: India-China Borders[1727]

Both states had limited border conflicts in 1967 and 1975, but they have generally avoided border clashes since the 1962 truce.[1728] India and China entered into a phase of normalized ties following the peace agreements of 1993 and 1996, allowing them to enhance their bilateral relations.[1729] As a result, bilateral trade between China and India, which was $0.2 billion in 1990, grew to $13.6 billion in 2004.[1730] It further grew to $77.66 billion by 2020, and China overtook the US as India's largest trading partner.[1731]

[1727] "Mapping India and China's Disputed Borders," *Aljazeera*, September 10, 2020, accessed February 15, 2022, https://interactive.aljazeera.com/aje/2020/mapping-india-and-china-disputed-borders/index.html
[1728] "Mapping India and China's Disputed Borders," *Aljazeera*
[1729] Zhang and Li, Sino-Indian Border Disputes, 7
[1730] Swaran Singh, "China-India Bilateral Trade: Strong Fundamentals, Bright Future," *China Perspectives*, Vol. 62, (2005), 2-3
[1731] Sutirtho Patranobis and Rajeev Jayaswal, "Data shows Trade between Beijing, New Delhi grew in 5 Months of 2021, *Hindustan Times*, June 9, 2021, accessed October 16, 2021, https://www.hindustantimes.com/world-news/data-shows-trade-between-beijing-new-delhi-grew-in-5-months-of-2021-101623179540344.html

However, border disputes remain unsettled between them, and both view each other as strategic competitors.[1732]

Border tensions between the states gained momentum once again in June 2017 when China attempted to build a road in Doklam, an area close to the Sino-Indian border disputed by Bhutan and China. This led to the deployment of Indian forces near the border.[1733] The immediate military deployments by the two countries elevated the risks of military confrontations between the two states. In April 2018, Indian Prime Minister Narendra Modi and Chinese President Xi Jinping met in Wuhan, a meeting that inaugurated the "Wuhan Reset" to mitigate border tensions.[1734] Notwithstanding, the summit to improve India and China's relations failed to lead to a broader peace, and in June 2020, a clash occurred between the states at the Ladakh border at the Aksai Chin region. This cost India at least 20 soldiers, and 76 were wounded, whereas China lost four soldiers.[1735] Then in September 6, 2020, a new argument broke out between the states when the Indian army leveled allegations against the PLA for the abduction of five men from an area near the disputed region of Arunachal Pradesh.[1736] More recently, on September 8, 2020, the states accused each other of firing shots, violating the 1996 cease-fire agreement. According to the agreement, neither state shall open fire within 2km of the Line of Actual Control (LAC).[1737] The row at the Pangong Tso Lake, in the Aksai Chin region, was the second incident within a week, followed by a ministerial-level meeting between Indian Defense Minister Rajnath Singh and his Chinese counterpart General Wei Fenghe on the side lines of the Shanghai Cooperation Organisation (SCO)

[1732] Tanvi Madan, "Managing China: Competitive engagement, with Indian characteristics," *Brookings*, February 2020, accessed March 9, 2021, https://www.brookings.edu/research/managing-china-competitive-engagement-with-indian-characteristics/

[1733] Manoj Joshi, "Doklam: To Start at the Very Beginning," *Observer Research Foundation Special Report*, No. 40 (August 2017), https://www.orfonline.org/wp-content/uploads/2017/08/ORF_SpecialReport_40_Doklam.pdf.

[1734] Dhruva Jaishankar, The India–China summit in Wuhan was no reset, *The Interpreter*, May 10, 2018, accessed February 16, 2022, https://www.lowyinstitute.org/the-interpreter/india-china-summit-wuhan-was-no-reset

[1735] Mini Lau, China-India border clash in June left four Chinese dead, one injured, report reveals, *SCMP*, February 19, 2021, accessed March 9, 2021, https://www.scmp.com/news/china/diplomacy/article/3122320/china-india-border-clash-june-left-four-chinese-dead-one

[1736] Amrita Nayak Dutta, Army has contacted Chinese PLA over 'abduction' of 5 men from Arunachal border, says Rijiju, *The Print*, September 6, 2020, accessed February 16, 2022, https://theprint.in/defence/army-has-contacted-chinese-pla-over-abduction-of-5-men-from-arunachal-border-says-rijiju/497193/

[1737] Matt Ho, China, India accuse each other of firing shots in tense border region, *SCMP*, September 8, 2020, accessed September 9, 2020, https://www.scmp.com/news/china/diplomacy/article/3100609/china-accuses-indian-troops-firing-warning-shots-tense-border

Defense Ministers' meeting in Moscow on September 4, 2020.[1738] Later, on September 10, 2020, Indian Foreign Minister Subrahmanyam Jaishankar and Chinese Foreign Minister Wang Yi met on the side lines of the SCO foreign ministers' conference.[1739] A joint statement was issued, saying, "both sides shall abide by the existing agreements and protocol on bilateral boundary affairs, maintain peace and tranquillity in the border areas and avoid any action that could escalate matters". Despite reconciliatory rhetoric, the border situation remained tense and strained. Media reports and satellite images reveal that India and China have increased military activities and troops' deployment. In November 2021, China flew its long-range strategic bomber close to its border with India.[1740] Later India deployed the S-400 air and missile defense system close to its border with China.[1741] This new series of provocations from both nuclear weapons adversaries could increase the chances of war compared to past standalone incidents, such as the 2017 Doklam Standoff.

Table 22. Doklam Standoff Timeline – June-August 2017

Date	Doklam Incident – July – August 2020
June 16	PLA attempts to construct a road in a bottleneck – a think passage that links India with its North-east
June 28	Indian army intervened and stopped the construction
July 6	Xi called off the meeting with Modi at G-20, citing the time being "not right" for it
July 16	PLA holds live-fire drills in Tibet, close to the border with India, at Arunachal
July 19	Indian FM tells parliament if China unilaterally changes the status quo, it poses a threat to India's security
July 24	China's FM accuses India of triggering standoff and calls to withdraw troops

[1738] Raksha Mantri Shri Rajnath Singh meets Chinese Defense Minister at latter's request on the sidelines of SCO meeting in Moscow, Ministry of External Affairs, Government of India, September 5, 2020, accessed September 9, 2020, https://www.mea.gov.in/press-releases.htm?dtl/32940/Raksha+Mantri+Shri+Rajnath+Singh+meets+Chinese+Defense+Minister+at+latters+request+on+the+sidelines+of+SCO+meeting+in+Moscow

[1739] James MacHaffie, "The Shanghai Cooperation Organization's Limited Role In Easing Tensions Between China and India," *James Town Foundation*, China Brief Volume: 20 Issue: 22, https://jamestown.org/program/the-shanghai-cooperation-organizations-limited-role-in-easing-tensions-between-china-and-india/

[1740] Minnie Chan, "China sends Long-Range Bomber to Border with India," *SCMP*, November 16, 2021, accessed February 16, 2022, https://www.scmp.com/news/china/military/article/3156258/china-sends-long-range-bomber-border-india

[1741] Liam Gibson, "India deploys Russian-made S-400 Missile Defense System to guard against China," *Taiwan News*, December 21, 2021, accessed February 16, 2022, https://www.taiwannews.com.tw/en/news/4383519

July 29	Xi addressing a military parade, stated, "we will never allow any people, organization or political party to split any part of Chinese territory out of the country at any time, in any form."
August 8	Beijing rejected India's offer for mutual withdrawal
August 15	PM Modi, on Indian independence day, stated India as being capable of thwarting any security challenges
August 16	• The US urged China and India to resolve the dispute mutually • China (Xinhua) released a video of the clash, humiliating India
August 20	China conducts military drills near the Himalayan border with India
August 28	India agreed with China on an "expeditious disengagement" and troop withdrawal. Beijing insists on continued military patrols

The timeline above highlights the course of events that unfolded during the Doklam standoff. It shows how China responded by conducting military exercises in other areas close to the Indian border and how China's political leadership was resistant to de-escalating the standoff early. The situation escalated again in May 2020, when in the Galwan Valley, a sudden fight turned into a brutal clash, leaving 20 Indian and four Chinese soldiers dead. Though both sides retreated to the positions behind the LAC, the Galwan Valley clash led to the region's militarization.[1742] Since the Galwan Valley clash, both sides, have in total, deployed approximately 50,000 to 55,000 troops, including support forces such as engineers and helpers, each along the LAC. This is an approximately fivefold increase on the previous numbers.[1743] These trends reflect that the security situation is precarious between the two states. Amidst such a security environment, China's ongoing nuclear force modernization may significantly affect bilateral relations. The next section explores the possible implication of China's nuclear force modernization for India.

[1742] Stephen P. Westcott, "Seizing a Window of Opportunity? The Causes and Consequences of the 2020 Sino-Indian Border Stand-off," *Journal of Asian Security and International Affairs*, Vol. 8, No. 1, (2021) 7-32

[1743] Ibid; Henry Boyd and Meia Nouwens, "Understanding the military build-up on the China–India border," *International Institute for Strategic Studies*, June 18, 2020, accessed February 16, 2022, https://www.iiss.org/blogs/analysis/2020/06/china-india-border

Table 23. China vs. India Defense Expenditure[1744]

China vs. India Defense Expenditure in $US B.					
State	**Year**				
	2000	2005	2010	2015	2020
China	43.07	79.91	143.93	213.52	244.93
India	28.97	37.77	51.67	54.29	73.00

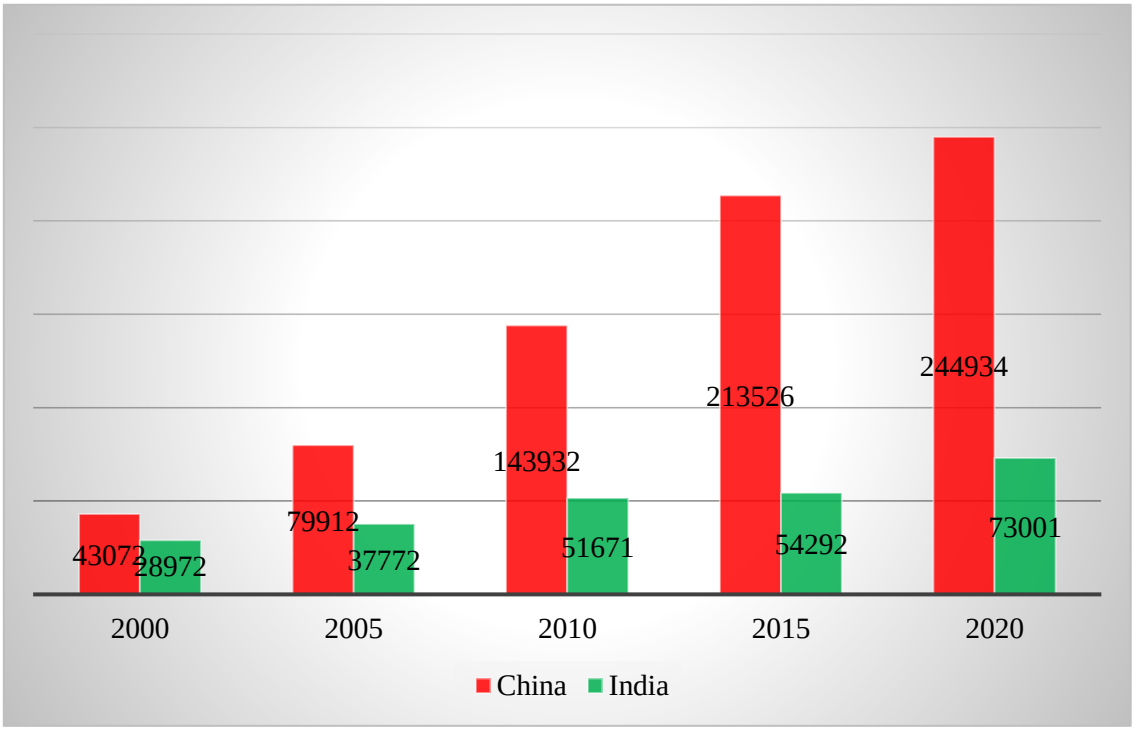

Figure 15: China vs. India Defense Expenditure 2000-2020

8.3 Nuclear China and Implications for India

China's conventional and nuclear force modernization will continue to influence India's threat perceptions. There is consensus among scholars that India's security concerns about China were the most critical factor that led New Delhi to develop nuclear weapons.[1745] In 1974, India demonstrated its nuclear capability for the first time by a so-called "peaceful nuclear explosion."[1746] In May 1998, India conducted more tests with

[1744] "Military expenditure by country, in constant (2019) US$ m., 1988-2020" © SIPRI 2021, accessed October 16, 2021, https://sipri.org/sites/default/files/Data%20for%20all%20countries%20from%201988%E2%80%932020%20in%20constant%20%282019%29%20USD%20%28pdf%29.pdf

[1745] Harsh V. Pant, "The India–US–China Triangle from New Delhi: Overcoming the 'Hesitations of History,'" *India Review*. Vol. 18, Issue 4, (2019), 386-406; John W. Garver, *Protracted Contest: Sino-Indian Rivalry in the Twentieth Century* (Seattle and London: University of Washington Press, 2001)

[1746] Bhumitra Chakma, "Toward Pokhran II: Explaining India's Nuclearization Process," *Modern Asian Studies*, Vol. 39, No. 1, 189-236

clear statements saying their decision to develop a nuclear deterrent was a necessary and prudent security response to changes in the "nuclear environment in India's neighborhood."[1747] At that time, the only overt nuclear weapons state in India's neighborhood was China, whose military influence in the region was growing.[1748] According to former Indian Defense Minister George Fernandes, the Indian Prime Minister wrote a letter to the Group of Eight (G-8) explaining that India's tests were a response to China's program. Prime Minister Atal Bihari Vajpayee made this explicit, saying: "We have an overt nuclear weapons state on our borders, a state which committed armed aggression against India in 1962."[1749] Following the May 1998 nuclear test, former Chairman of the Atomic Energy Commission, P.K. Iyengar, asserted that India had become "on par with China."[1750] In other words, Indian officials believed they had to acquire and enhance their nuclear forces to establish a strategic balance with China. To some, the nuclearization of India was part of the broader security dilemma between India and China.[1751]

Similarly, India has continued to justify its military force modernization efforts by referencing Chinese nuclear force modernization.[1752] India, historically, had a significant concern over its delivery systems; India deemed its nuclear deterrent to be lacking credibility until the country had developed capable delivery systems. India released an intelligence report after its 1998 tests saying China possessed nearly 450 nuclear warheads.[1753] However, Indian estimates appeared exaggerated since, even as of today (2021), there are estimates that China possesses 350 nuclear warheads.[1754] However, it is important to note that 2021 estimates do not include the possible number of warheads

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[1747] "Indian Government Statement on Nuclear Tests," May 11, 1998, https://www.atomicarchive.com/resources/documents/deterrence/india-statement.html
[1748] Ibid
[1749] John F. Burns, "India's New Defense Chief Sees Chinese Military Threat," *New York Times*, May 5, 1998, A6
[1750] *Deccan Herald*, "Indian Expert: Test Deterrent against China," May 16, 1998, <http://wnc.eastview.com/wnc/article?id=41038947>
[1751] Lora Saalman, ,"Divergence, Similarity and Symmetry In Sino-Indian Threat Perceptions," *Journal of International Affairs*, Vol. 64, No. 2, (2011), 169-194
[1752] Prem Shankar Jha, "Why India Went Nuclear," *World Affairs: The Journal of International Issues*, Vol. 2, No. 3 (1998), 80-96; Meredith Roaten, "SPECIAL REPORT: India Manages Diverse Arms Sources for Military Modernization," *National Defense*, September 12, 2021, accessed February 17, 2022, https://www.nationaldefensemagazine.org/articles/2021/12/9/india-manages-diverse-arms--sources-for-military-modernization; "How India is ramping up efforts to bolster military capability," *DW*, January 5, 2022, accessed February 16, 2022, https://www.dw.com/en/how-india-is-ramping-up-efforts-to-bolster-military-capability/a-60336292; Chietigj Bajpaee, "China-India: Regional Dimensions of the Bilateral Relationship," *Strategic Studies Quarterly*, Vol. 9, No. 4 (2015), 108-145
[1753] S.R. Valluri, "Lest We Forget," *Current Science*, Vol. 76, No. 9, (1999), 1, 182
[1754] :Chinese Nuclear Forces 2020," *Bulletin of the Atomic Scientists 2020*," Vol. 76, No. 6, 443-457

China may require for its newly discovered missile silo fields, as discussed in Chapter Six. China did not release any official document at the time (1998) detailing its nuclear arsenal size. This Chinese policy of opacity, therefore, can lead to misperceptions about its nuclear deterrent, as seen in India's seemingly exaggerated estimate of China's program. The Indian Standing Committee on Defense asserted that China's nuclear force could be directed against India in any event. Therefore, India must develop delivery systems capable of reaching China.[1755] Under the recommendations, India developed the Agni-II surface-to-surface ballistic missile. [1756] Similarly, India developed other extended-range Angi missiles based to increase its strike range inside China.[1757] The table below shows a comparison between China and India based on their strategic capabilities. China has an operational nuclear triad, while India lacks strategic bombers in its nuclear inventory. However, India does have fighter jets for the tactical role of delivering nuclear weapons, albeit at short range: a capability more suitable against the enemy on its western border, Pakistan.

Table 24. Chinese vs. Indian Nuclear Forces – A Comparison[1758]

China-India Strategic Capabilities		
	China	**India**
Land-based ballistic missiles	280 (350+ newly found silos based)	70
Submarine-launched ballistic missiles	6 SSBNs, each carrying 12 SLBMs; Total: 72	14 launchers / 16 warheads
Bombers	20	-

[1755] "India to Test Fire Agni-II Missile in 'Very Near' Future," *Deccan Herald*, September 5, 1998, http://wnc.eastview.com/wnc/article?id=41039509>; "Capability of New Agni Missile 'Guarded Secret,'" *The Pioneer*, August 20, 1998, http://wnc.eastview.com/wnc/article?id=41036631

[1756] Rahul Datta: "India Plans 6,000-km Range Agni-IV Missile," *Times of India*, December 13, 2007, https://timesofindia.indiatimes.com/india/India-plans-6000-km-range-Agni-IV-missile/articleshow/2618413.cms; *The Pioneer*, "Agni Test Fired Successfully," May 8, 2008, http://wnc.eastview.com/wnc/article?id=30887070; "Agni-V to Be Test-Fired by Year-End," *Political and Defense Weekly*, July 7, 2011, <http://wnc.eastview.com/wnc/article?id=32782103; "India Considering Proposal to Develop 10,000 km-range ICBMs," *The Pioneer*, June 19, 2011, http://wnc.eastview.com/wnc/article?id=39841884>

[1757] Ibid

[1758] Hans M. Kristensen and Matt Korda, "Chinese Nuclear Forces," *Bulletin of the Atomic Scientists 2020*, Vol. 76, No. 6, (2020), 443-457, https://www.tandfonline.com/doi/pdf/10.1080/00963402.2020.1846432?needAccess=true; Hans M. Kristensen and Matt Korda, "Indian nuclear forces, 2020," *Bulletin of the Atomic Scientists 2020*, Vol. 76, No. 4, (2020), 217-225

Similarly, India continues to justify its sea-based nuclear deterrent with regard to the Chinese threat.[1759] Both India's military and government officials claim that India required a sea-based nuclear force to counter Chinese nuclear-armed submarines and deter the overall Chinese conventional and nuclear threat.[1760] Indian military officials have claimed that Chinese forces in the Indian Ocean and the asymmetry between Chinese and the Indian naval capabilities have heightened India's threat perception.[1761] While expressing concern over China's SLBMs, Indian military affairs experts noted that the Chinese JL-2 SLBM and growing missile asymmetry posed a direct threat to India.[1762] The intense threat perception from the Chinese sea-based nuclear deterrent made it inevitable for India to develop a reliable nuclear deterrent to survive a potential first strike.[1763]

8.3.1 Contemporary India-China Security Dilemma

Currently, India finds itself locked in rivalry with China, leading to a security dilemma situation.[1764] Rivalry implies that India does not see China's military buildup as benign, and its defensive-claimed force modernization is generating waves of insecurity, felt in Delhi.[1765] States with disputes make it relatively easy to justify their own military buildup against their rival's 'innate' hostility and aggression. Indian officials are apprehensive of

[1759] Ramesh Thakur, "India's Submarine Rivalry with China in the Second Nuclear Age," *ASPI*, February 15, 2019, https://www.aspistrategist.org.au/indias-submarine-rivalry-with-china-in-the-second-nuclear-age/; Nathan Powell, "The Arihant-Class SSBN and the Advent of Sea-Based Nuclear Forces in India, China, and Pakistan," (ed.) Mark Cancian, *Project on Nuclear Issues: A Collection of Papers from the 2017 Conference Series and Nuclear Scholars Initiative*, 136-146

[1760] Yogesh Joshi, "Angles and Dangles: Arihant and the Dilemma of India's Undersea Nuclear Weapons," *War on The Rocks*, January 14, 2019, accessed February 17, 2022, https://warontherocks.com/2019/01/angles-and-dangles-arihant-and-the-dilemma-of-indias-undersea-nuclear-weapons/; S.N. Sachadeva, "China's Nuke Buildup," *Daily Excelsior*, May 8, 2008, http://wnc.eastview.com/wnc/article?id=30887591

[1761] Ibid; S.N. Sachadeva, "China's Nuke Buildup," *Daily Excelsior*, May 8, 2008, http://wnc.eastview.com/wnc/article?id=30887591

[1762] Neha Kumar, "Engaging China's Nuclear and Missile Threat," *India Quarterly*, Vol. 65, No. 1 (2009), 37-53; Thangavel K. Balasubramaniam and Ashok Kumar Murugesan, "China's Rising Missile and Naval Capabilities in the Indo-Pacific Region: Security Implications for India and Its Allies," *Journal of Indo-Pacific Affairs*, US Air University, June 8, 2020, accessed February 17, 2022, https://www.airuniversity.af.edu/JIPA/Display/Article/2210972/chinas-rising-missile-and-naval-capabilities-in-the-indo-pacific-region-securit/

[1763] Ibid

[1764] Rajesh Basrur, Anit Mukherjee, and T.V. Paul eds, *India–China maritime competition: the security dilemma at sea*, (Routledge: London, 2019), 192; "The Security Dilemma and India–China Relations," *Asian Security*, Vol. 15, No. 1 (2019), 60-72; John W. Garver, "The security dilemma in Sino-Indian relations," *India Review*, Vol. 1, No. 4 (2002), 1-38; : Yogesh Joshi and Anit Mukherjee, From Denial to Punishment: The Security Dilemma and Changes in India's Military Strategy towards China, *Asian Security*, Vol. 15, No. 1 (2019), 25-43; Alexey D. Muraviev, Dalbir Ahlawat and Lindsay Hughes, "India's Security Dilemma: Engaging Big Powers while Retaining Strategic Autonomy," *International Politics* (2021) (Online)

[1765] Ibid

China's nuclear force modernization. Some claim that it is only a matter of time until China acts as a regional hegemon.[1766] India's struggle for sea-based deterrence also suggests that it is trying to match China's emerging sea-based capabilities to and ensure a strategic balance and a credible second-strike capability. Additionally to the Chinese nuclear capabilities, there is a significant debate in India regarding Chinese intent.[1767] India's perception of China's intent is primarily based on historical events. Some analysts explain that the Sino-India War of 1962 did not end with conclusive results, and the border issue is still a stalemate, which China seeks to settle in its favor eventually.[1768] The 2017 Doklam incident and the Galwan Valley clash along the LAC in May 2020 have further strengthened these perceptions. According to some analysts, recent clashes are the byproduct of China's growing conventional and nuclear advantage over India.[1769] This is giving Beijing greater confidence and freedom of military action, leading Indian and western analysts to fear China may engage India in a protracted low-intensity conflict in the future.[1770] And some believe that a low-intensity confrontation with China may escalate to a full-fledged war in the future.[1771]

[1766] Arun Kumar Singh, "India: Navy, Coast Guard Must Get More Funds, Powers," *Asian Age*, June 2, 2008, http://www.srilankaguardian.org/2008/06/india-navy-coast-guard-must-get-more.html; Rahul Bedi, "Indian Army Chief Plans Nuclear-Proof, Hi tech Force," *Asian Age*, January 16, 2001, <http://wnc.eastview.com/wnc/article?id=36704558>; Gurmeet Kanwal, "India's Borders," *Force*, January 1, 2008, <http://wnc.eastview.com/wnc/article?id=30670583>

[1767] "China and India's Nuclear Posture and Practice," Carnegie Moscow, June 02, 2011, accessed February 17, 2022, https://carnegiemoscow.org/2011/06/02/china-and-india-s-nuclear-posture-and-practice-event-3353; Koh Swee Lean Collin, "China-India Rivalry at Sea: capability, trends, and challenges," in Basrur, Mukherjee, and Paul eds, *India–China Maritime Competition;* "Editorial Sees PRC Strategy to Undermine Security," *The Pioneer*, October 23, 1996, http://wnc.eastview.com/wnc/article?id=40890064

[1768] Ibid

[1769] Arzan Tarapore, "The Crisis After The Crisis: How Ladakh Will Shape India's Competition With China," *Lowy Institute*, May 6, 2021, accessed February 17, 2022, https://www.lowyinstitute.org/publications/crisis-after-crisis-how-ladakh-will-shape-india-s-competition-china; Yusuf Unjhawala, "A New Chinese Threat Warrants a Review of NFU Policy," *Live Mint*, September 6, 2018, www.livemint.com/Opinion/PAWKKFNEQgg2gdLPpgxLXO/Opinion--A-newChinese-threat-warrants-a-review-of-NFU-poli.html

[1770] Ibid; Lt. General VK Ahluwalia, "China's Adventurism in Eastern Ladakh - A Strategic Miscalculation," *Wilson Center*, July 20, 2020, accessed February 18, 2022, https://www.wilsoncenter.org/article/chinas-adventurism-eastern-ladakh-strategic-miscalculation; Christopher Rossi, "Interstitial Space and the High Himalayan Dispute between China and India," *Harvard International Law Journal*, Vol. 62, No 2 (2021); Mohan Malik, "Distant Dream," *Force*, October 1, 2007, http://wnc.eastview.com/wnc/article?id=32164160; Arvind Gupta, "China's Defense White Paper 2013: Lessons for India," *Political and Defense Weekly*, April 30, 2013, http://wnc.eastview.com/wnc/article?id=30005798>; Bertil Lintner, "Not a border dispute," *India Today*, January 22, 2018, accessed February 17, 2022, https://www.indiatoday.in/magazine/cover-story/story/20180122-india-china-boder-dispute-doklam-standoff-sikkim-border-1131376-2018-01-12

[1771] Daniel S. Markey, "Preparing for Heightened Tensions Between China and India," *CFR*, April 19, 2021, accessed February 16, 2022, https://www.cfr.org/report/preparing-heightened-tensions-between-china-and-india; Tarapore, "Mitigating the Risk of a China–India Conflict"; Chietigj Bajpaee, "New Normal In Sino-Indian Ties," *War on the Rocks*, April 21, 2021, accessed February 17, 2022,

In rhetoric, China remains committed to its NFU policy in the nuclear realm, pledging to use its nuclear weapons only to retaliate against a nuclear first strike. This provides China with the 'moral high-ground.'[1772] However, owing to the growing asymmetry between the Indian and Chinese nuclear forces, the supposed moral underpinning of China's NFU policy does not influence India's threat calculation, with worst-case scenario planning taking place.[1773] Some Indian nuclear pessimists opine that China might adopt a more aggressive posture once it achieves absolute advantage (a state's ability to produce or procure arms at a higher quality and a faster rate) over India in the nuclear and conventional domain.[1774] They believe that China might also use the condition NFU against non-nuclear weapons states only once it achieves rough parity with the US.[1775] Some believe that Beijing's newfound aggressive territorial posture with India is linked to its emerging nuclear weapons force modernization; as its nuclear weapons capabilities expands, China's leaders feel more comfortable in asserting Beijing's power as other states may be more loathe to challenge it given they face a more potent nuclear-armed China.[1776] This is one possible reason India is participating in the QUAD and doing joint naval exercises in the Indo-Pacific with other QUAD states and states such as the UK and France, signaling an emerging coalition against China's growing military capabilities.[1777]

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https://warontherocks.com/2021/04/china-and-india-de-escalation-signals-new-normal-rather-than-a-return-to-the-status-quo/

[1772] Yusuf Unjhawala, "A New Chinese Threat Warrants a Review of NFU Policy," *Live Mint*, September 6, 2018, www.livemint.com/Opinion/PAWKKFNEQgg2gdLPpgxLXO/Opinion--A-newChinese-threat-warrants-a-review-of-NFU-poli.html

[1773] Mohan Malik, "Distant Dream," *Force*, October 1, 2007, http://wnc.eastview.com/wnc/article?id=32164160

[1774] Arvind Gupta, "China's Defense White Paper 2013: Lessons for India," *Political and Defense Weekly*, April 30, 2013, http://wnc.eastview.com/wnc/article?id=30005798>

[1775] Pravin Sawhney, "Different Nuclear Doctrines," *The Pioneer*, June 3, 2004, http://wnc.eastview.com/wnc/article?id=35675755; Gurmeet Kanwal, "China Poses Long-Term Strategic Challenge to India," *Political and Defense Weekly*, July 5, 2011, http://wnc.eastview.com/wnc/article?id=32775232; Vice Admiral Vijay Shankar, "India–Pakistan and Tactical Nuclear Weapons: A Step Closer to the Abyss," *Institute of Peace and Conflict Studies* Online, November 30, 2013, http://wnc.eastview.com/wnc/article?id=37807949; *Institute of Peace and Conflict Studies* Online, "Delhi Article Urges India to Discard Nuclear Doctrine of 'Unacceptable Damage,'" October 30, 2009, http://wnc.eastview.com/wnc/article?id=39690512; Ali Ahmed, "Nuclear Implication of the Two-Front Formulation," *Institute for Defense Studies and Analyses*, January 29, 2010, https://idsa.in/idsacomments/NuclearImplicationsoftheTwoFrontFormulation_aahmed_290110; Bhumitra Chakma, (eds.) The Politics of Nuclear Weapons in South Asia (Farnham, UK: Ashgate, 2011), p 103

[1776] Jyotishman Bhagawati, China's Grand Strategy in Asia, *Vivekananda International Foundation*, December 21, 2016, www.vifindia.org/article/2016/december/21/china-s-grand-strategy-in-asia; Subhash Kapila, "China Generates Strategic Polarisation in Asia," *Political and Defense Weekly*, July 24, 2012, http://wnc.eastview.com/wnc/article?id=30363233

[1777] Kiran Sharma and Mailys Pene-Lassus, France to lead Quad naval drill in Indo-Pacific challenge to China, *Nikkei Asia*, April 2, 2021, accessed June 5, 2021, https://asia.nikkei.com/Politics/International-relations/Indo-Pacific/France-to-lead-Quad-naval-drill-in-Indo-Pacific-challenge-to-China

Additionally, China is trying to make inroads in the Indian Ocean Region (IOR).[1778] The region has gained strategic importance over time. In 2020, more than 75 percent of global maritime trade and more than 50 percent of global daily oil transportation took place through IOR.[1779] IOR is the center stage where China and India strategic competition is unfolding as China, to secure its SLCs, has expanded its regional outreach under the so-called 'String of Pearls' strategy.[1780] This strategy has led China to increase its economic, military, diplomatic, and political clout in the IOR.[1781] China's strategic relations with IOR states, such as Pakistan and Sri Lanka, have made India feel its strategic encirclement by Beijing.[1782] To increase its presence in the Indian Ocean, China's Type 091 nuclear-powered submarine made its first debut in 2014 at Colombo Port, Sri Lanka. In the same year, China informed India that a Type-093 nuclear-powered attack submarine would also traverse the Indian Ocean region.[1783] These developments have pushed India to develop its own string of pearls strategy, which it started by building dual-use facilities in Mauritius and the Seychelles in 2015. An Indian attempt to rebalance China's move to secure the SLCs, reflects the growing security dilemma, leading to a net decrease in the security of both states.[1784] Moreover, India increased the pace of its SSBNs program. In November 2018, the Indian government announced that INS Arihant, an SSBN, commissioned in 2016, had made its maiden deterrent patrol.[1785] However, it is unclear whether nuclear weapons were on board during 20 days of deterrent patrol.[1786] The INS Arihant can carry up to 12 nuclear-capable K-15 SLBMs.[1787] The K-15 has a range of

[1778] Don McLain Gill, Between the Elephant and the Dragon: Examining the Sino-Indian Competition in the Indian Ocean, *Journal of the Indian Ocean Region* (2020)
[1779] Priyanjoli Ghosh, India's Indian Ocean Region Strategy, *Journal Of Indo-Pacific Affairs*, Fall 2020 (online), 146-147
[1780] Zhou Bo, "The String of Pearls and the Maritime Silk Road," *China-US Focus*, February 11, 2014, accessed February 17, 2022, https://www.chinausfocus.com/foreign-policy/the-string-of-pearls-and-the-maritime-silk-road
[1781] "String of Pearls and China's Emerging Strategic Culture," *Strategic Studies*, Vol. 37, No. 4 (2017), 166-181
[1782] Saurabh Singh, "China's Strategic Relations with Sri Lanka," *South Asian Voices*, July 10, 2020, accessed February 18, 2022, https://southasianvoices.org/chinas-strategic-relations-with-sri-lanka/
[1783] Zachary Keck, "India has Reason to Fear China's Submarines in the Indian Ocean," *The National Interest*, September 21, 2019, accessed February 1, 2021, https://nationalinterest.org/blog/buzz/india-has-reason-fear-chinas-submarines-indian-ocean-82301
[1784] Basrur, Mukherjee, and Paul eds., India-China maritime competition, 2
[1785] Aqeel Akhtar, "Nuclear Submarines Shift Strategic Balance of Indian Ocean," *IISS*, January 29, 2019, accessed March 10, 2021, https://www.iiss.org/blogs/analysis/2019/01/nuclear-submarines-indian-ocean
[1786] Kristensen and Korda, "Indian nuclear forces, 2020," 222
[1787] Missile Defense Project, "Sagarika/Shaurya," *Missile Threat*, Center for Strategic and International Studies, August 11, 2016, last modified June 29, 2020, accessed March 9, 2021, https://missilethreat.csis.org/missile/sagarika-shaurya/.

700km.[1788] India began the development of its second SSBN INS Arighat in November 2017, which is expected to be commissioned in 2022.[1789] India is also testing the long-range K-4 SLBM, with an expected 3500km range.[1790] The K-4 SLBM is reportedly ready for serial production.[1791] The INS Arihant and upcoming INS Arighat would be able to carry up to 12 K-15s or four nuclear-capable K-4s.[1792] India is building two new submarine bases, which appear as part of a project that includes funding for six SSNs in the next 15 years.[1793] In addition to the SLBMs, India's sea-based nuclear missile inventory includes the dual-capable Brahmos SLCM.[1794] It also operated 15 diesel-electric submarines (SSKs).[1795]

Table 25. China vs. India Submarines Capabilities[1796]

Types of Submarines	China	India
Ballistic Missile Submarines (SSBNs)	6	1(+1 in 2022)
Nuclear-powered attack submarines (SSNs)	6	1(+3 in 2022)
Diesel-electric attack submarines (SSKs)	50	15
Air-independent propulsion (AIP) enabled	17/60	0
Total Submarines	60	16

The table above shows a significant relative difference in the strategic maritime capabilities weighted against India. However, the gap is likely to shrink once India operationalizes two additional S4 and S4* SSBNs by 2025 and six SSNs (the plan is with

[1788] Missile Defense Project, "Nirbhay," *Missile Threat*, Center for Strategic and International Studies, August 11, 2016, last modified November 27, 2018, accessed March 10, 2021, https://missilethreat.csis.org/missile/nirbhay/.
[1789] Shishir Gupta, "Is AUKUS Pact a Signal to India to go for Nuclear Attack Submarines?" *The Hindustan Times*, September 18, 2021, accessed February 18, 2022, https://www.hindustantimes.com/india-news/is-aukus-pact-a-signal-to-india-to-go-for-nuclear-attack-submarines-101631944254552.html
[1790] Kristensen and Korda, "Indian nuclear forces, 2020," 222
[1791] Rajat Pandit, "Arihant's N-capable Missile 'Ready to Roll' *Times of India*, Updated January 25, 2020, accessed February 18, 2022, https://timesofindia.indiatimes.com/india/india-successfully-test-fires-k-4-submarine-launched-missile/articleshow/73589861.cms
[1792] Indian Submarine Capabilities, *NTI*, February 18, 2021, accessed march 10, 2021, https://www.nti.org/analysis/articles/india-submarine-capabilities/
[1793] Akhtar, "Nuclear Submarines Shift Strategic Balance of Indian Ocean"
[1794] Ibid
[1795] Krishn Kaushik, "Explained: India's Submarine Strength," *The Indian Express*, Updated November 9, 2021, accessed February 19, 2022, https://indianexpress.com/article/explained/simply-put-indias-submarine-strength-7613847/
[1796] "India Submarine Capabilities," *NTI*; "China Submarine Capabilities," *NTI*, February 17, 2021, accessed March 10, 2021, https://www.nti.org/analysis/articles/china-submarine-capabilities/; Commodore Lalit Kapur, "Whither India's Submarines," *Dehli Policy Group*, May 27, 2021, accessed February 18, 2022, https://www.delhipolicygroup.org/publication/policy-briefs/whither-indias-submarines.html

the cabinet committee on security for approval) in a decade.[1797] India's threat perception of China is growing. The induction of trans-domain weapons, such as the DF-26, DF-21, and DF-17, capable of carrying conventional and nuclear warheads, are viewed as critical capabilities by the strategic community.[1798] Furthermore, China's development of hypersonic delivery systems has prompted India to become involved in a hypersonic weapons race.[1799] India conducted its first hypersonic demonstrator test in September 2020.[1800] Indian analysts consider the development of hypersonic weapons by China as destabilizing for two reasons; one, these weapons could carry both conventional and nuclear warheads and it is hard to identify or differentiate in-flight as to which payload they carry; and two, these weapons are difficult to detect because of their high speed and low trajectory.[1801] The analysts consider the missile's hypersonic speed as destabilizing because such weapons reduce the time for decision-making and response.[1802] In this regard, Indian analysts consider that if India does not compete with China in hypersonic missile technologies, it will be in a disadvantageous position.[1803] In other words, India is being forced to respond even though the tit-for-tat cycle is perceived to be undermining both sides' security by increasing their insecurity.[1804] The action-reaction is leading to a net decrease in security, and analysts such as Richard Fisher explain that "it is very likely

[1797] Sandeep Unnithan, "India's Nuclear Sharks," *India Today*, Updated; April 23, 2021, accessed February 18, 2022, https://www.indiatoday.in/magazine/defence/story/20210426-india-s-nuclear-sharks-1791817-2021-04-17; Zia Mian, M.V. Raman, and A.H. Nayyar, "Nuclear Submarines in South Asia: New Risks and Dangers," *Journal for Peace and Nuclear Disarmament*, Vol. 2, No. 1 (2019), 184-202

[1798] James M. Acton, Thomas D. MacDonald and Pranay Vaddi, *Reimagining Nuclear Arms Control*, (CEIP, 2021), 95; Masahiro Kurita, "China-India Relationship and Nuclear Deterrence," *NIDS Journal of Defense and Security*, No. 19 (2018), 40-43; Bill Gertz, "China Unveils New Nuke Missile," *The Washington Free Beacon*, March 7, 2012, accessed February 18, 2022, https://freebeacon.com/issues/china-unveils-new-nuke-missile/

[1799] Kelley M. Sayler, "Hypersonic Weapons: Background and Issues for Congress," (Washington, DC: Congressional Research Service, December 1, 2020, https://fas.org/sgp/crs/weapons/R45811.pdf.

[1800] Lt. Gen. Prakash Menon, "China's Hypersonic Missile Test got US, India Racing," *The Print*, November 2, 2021, accessed February 19, 2022, https://theprint.in/opinion/chinas-hypersonic-missile-test-got-us-india-racing-it-exposes-bmd-vulnerability/760091/

[1801] "Hypersonic Weapons and Strategic Stability," *Strategic Comments*, Vol. 26, Comment 4, https://www.iiss.org/publications/strategic-comments/2020/hypersonic-weapons-and-strategic-stability.

[1802] Ibid; Menon, "China's Hypersonic Missile Test got US, India Racing

[1803] Dinakar Peri, "Explained: The Arms Race Towards Hypersonic Weapons," *The Hindu*, December 8, 2021, accessed February 18, 2022, https://www.thehindu.com/sci-tech/technology/explained-the-arms-race-towards-hypersonic-weapons/article37874968.ece; Srikanth Kondapalli, "China has taken the arms race to a different level," *Deccan Herald*, December 4, 2021, accessed February 18, 2022, https://www.deccanherald.com/opinion/china-has-taken-the-arms-race-to-a-different-level-1057727.html; Menon, "China's Hypersonic Missile Test got US, India racing,"

[1804] Yogesh Joshi and Anit Mukherjee, "From Denial to Punishment: The Security Dilemma and Changes in India's Military Strategy towards China," *Asian Security*, Vol. 15, No. 1 (2019), 25-43; John W. Garver, "The security dilemma in Sino-Indian relations," *India Review*, Vol. 1, No. 4 (2002), 1-38; Erik Herejk Ribeiro, "The Flaring Sino-Indian Security Dilemma: Is Conventional Deterrence Eroding?" *E-International Relations*, January 11, 2020, accessed March 23, 2021, https://www.e-ir.info/2020/01/11/the-flaring-sino-indian-security-dilemma-is-conventional-deterrence-eroding/

that, to the degree that China has aided North Korea's new hypersonic glide vehicle (HGV) missile warhead, it has or will similarly assist a Pakistani HGV, or simply sell the DF-17."[1805]

India military officials also consider growing Chinese cyber-warfare capabilities as destabilizing for strategic stability.[1806] In a recent National Cyber Power Index 2020, published by the *Belfer Center for Science and International Affairs* at Harvard Kennedy School, China was identified as the second most powerful cyber power out of 30 states, while India came in at twenty first.[1807] As cyber-attacks might be used against nuclear deployments, command and control facilities, and early warning systems, the challenge to India is severe due to the complexities related to the identification of the attacker involved in cyber-attacks.[1808] India's fear of losing a retaliatory capability to China's offensive cyber capabilities followed by first conventional precision strikes could lead to a significant shift in Indian nuclear strategy: a shift from a non-deployed posture to a launch-on-warning posture for nuclear weapons. Some analysts have argued that India is on this track; India is changing its nuclear use policy, which initially retained the nuclear use option in case of a major biological or chemical attack against it.[1809] These arguments are strengthened by Indian officials referring to nuclear doctrine as "evolving" and repeatedly emphasizing that future NFU commitments "depend on the circumstances."[1810] The first use in case of a cyber-attack would help India deter large-

[1805] Usman Ansari, "Can Pakistan counter India's new S-400 air defense system?" *Defense News*, January 17, 2022, accessed February 18, 2022, https://www.defensenews.com/global/asia-pacific/2022/01/16/can-pakistan-counter-indias-new-s-400-air-defense-system/

[1806] Prabhjote Gill, "The Chinese Cyber Threat is Real: and India's Best Defence Right Now is to Keep Its Outage Time Limited," *Business Insider*, April 9, 2021, accessed February 19, 2022, https://www.businessinsider.in/defense/news/the-chinese-cyber-threat-is-real-and-indias-best-defence-right-now-is-to-keep-its-outage-time-limited/articleshow/81981886.cms; Meredith Roaten, "Mumbai Incident Spotlights China's Cyber Capabilities," *National Defense*, March 3, 2021, accessed February 19, 2022, https://www.nationaldefensemagazine.org/articles/2021/3/3/mumbai-incident-spotlights-chinas-cyber-capabilities

[1807] Julia Voo et al., *National Cyber Power Index 2020*, (Cambridge, MA: Belfer Center for Science and International Affairs, 2020), 11

[1808] Pulkit Mohan, "Ensuring Cyber Security in India's Nuclear Systems," *Observer Research Foundation*, New Delhi, Issue Brief No. 412, October 2020, https://www.orfonline.org/wp-content/uploads/2020/10/ORF_IssueBrief_412_Cyber-Nuclear-Security.pdf

[1809] Ministry of External Affairs, "The Cabinet Committee on Security Reviews Operationalization of India's Nuclear Doctrine, January 4, 2003," accessed February 20, 2022, https://mea.gov.in/press-releases.htm?dtl/20131/The_Cabinet_Committee_on_Security_Reviews_perationalization_of_Indias_Nuclear_Doctrine+Report+of+National+Security+Advisory+Board+on+Indian+Nuclear+Doctrine; C. Clary and V. Narang, "India's Counterforce Temptations: Strategic Dilemmas, Doctrine, and Capabilities", *International Security*, Vol. 43, No. 3 (2019), 7-52

[1810] Ministry of External Affairs, Speech by NSA Shri Shivshankar Menon at NDC on 'The Role of Force in Strategic Affairs', October 21, 2010, https://www.mea.gov.in/Speeches-Statements.htm?dtl/798/Speech+by+NSA+Shri+Shivshankar+Menon+at+NDC+on+The+Role+of+Force

scale cyber-attacks against India's critical infrastructure, such as power stations, railways, banks, and conventional and nuclear command and control systems; whereas launch on warning would enable India to launch the first attack or retaliate in a short time, reducing the vulnerability to cyber-attackers. There exists evidence of Indian vulnerability to Chinese hackers. In 2017, a high-profile video meeting organized via satellite communication through the most sophisticated and secure link was compromised.[1811]

However, first use and launch-on-warning would further decrease the strategic stability as India would be encouraged to decentralize nuclear weapons control amidst its expanding and emerging SSBNs fleet. The threat is so real that the US in the 2018 NPR has explicitly mentioned that a cyber attack on US NC3 would constitute a "non-nuclear strategic attack" of a degree enough to justify the nuclear response; India may very well have the same view.[1812] Meanwhile, the Chinese conventional and nuclear force modernization and cyber capabilities could also push Indian policy-makers to reconsider their NFU pledge.[1813] The threshold for changes in Indian nuclear policy is not yet clear, but some nuclear experts have argued that India has already nearly given up the nuclear policy of NFU.[1814] Christopher Clary and Vipin Narang write, "the leadership in Delhi appears to be developing a nuclear arsenal that extends beyond the country's declared policy of credible deterrence and no first use of nuclear weapons."[1815] The changes in Indian nuclear policy are in response to China's nuclear weapons force modernization and will make China feel more insecure, inviting a reaction against India.

+in+Strategic+Affairs; Wan Wilfred, Andraz Kastelic and Eleanor Krabill, "The Cyber–Nuclear Nexus: Interactions and Risks, *Nuclear Risk Reduction*," (UNIDIR) Friction Points Series No. 2 (2021) 13; S. Miglani, "India Says Committed to 'No First Use' of Nuclear Weapons for Now", Reuters, 16 August 2019, https://www.reuters.com/article/us-india-nuclear-idUSKCN1V613F

[1811] Yatish Yadav, "Hackers from China Break into Secret Indian Government Video Chat," *New Indian Express*, November 19, 2017, accessed December 20, 2020, http://www.newindianexpress.com/nation/2017/nov/19/hackers-from-china-break-into-secret-indian-government-video-chat-1705010.html; Todd Harrison et al., "Space Threat Assessment 2019," *CSIS*, 2019, accessed February 20, 2022, https://aerospace.csis.org/wp-content/uploads/2019/04/SpaceThreatAssessment2019-compressed.pdf

[1812] Michael T. Klare, "Cyber Battles, Nuclear Outcomes? Dangerous New Pathways to Escalation," *Arms Control Association*, November 2019, accessed March 11, 2021, https://www.armscontrol.org/act/2019-11/features/cyber-battles-nuclear-outcomes-dangerous-new-pathways-escalation

[1813] David C. Gompert and Martin Libicki, "Cyber War and Nuclear Peace, *Survival*, Vol. 61, Issue 4, (2019), 45-62

[1814] Harsh V. Pant and Yogesh Joshi, "Is India Overturning Decades of Nuclear Doctrine?" *Foreign Policy*, October 23, 2020, accessed March 10, 2021, https://foreignpolicy.com/2020/10/23/india-nuclear-no-first-use-strike-china-pakistan/; Clary and Narang, "India's Counterforce Temptations," 7-52

[1815] Christopher Clary and Vipin Narang, "India's Counterforce Temptations: Strategic Dilemmas, Doctrine, and Capabilities," *International Security*, Vol. 43, No. 3, (2019), 7-52

Indian policy changes will also make Pakistan vulnerable, which already has a first use policy towards India because of its relative conventional asymmetry. This reflects a classical security dilemma principle wherein a state's move to secure itself makes it less secure, dragging it and other states into a vicious cycle; in this case, it is a nuclear security dilemma. A security dilemma in the nuclear realm may involve a state's nuclear weapons building, advancement and/or policy changes in its nuclear weapons use policy inducing changes in the policy of another state, which feels compelled to build, advance or expand and introduce new nuclear policy and capabilities to balance the growing nuclear threat (or surmount it).

The following sections deal with the second case study of this chapter, Taiwan. Taiwan, unlike India, is a peculiar case study because China considers Taiwan part of mainland China, whereas Taiwan presents itself as an independent state and different nation. The US does not recognize Taiwan as an independent state yet maintains robust unofficial relations. Given the recent increase in China-Taiwan and China-US tensions, Taiwan is emerging as a major potential flashpoint.[1816]

8.4 China's Nuclear Force Modernization and Implications for Taiwan

According to the US Defense Intelligence Agency (DIA), Taiwan is one of the most significant drivers behind China's PLA's training, restructuring, and modernization, which has significant security implications for Taiwan.[1817] China has been deploying short and long-range ballistic missiles and other military capabilities aimed at Taiwan to impede US forces from intervening should Beijing ever invade the island.[1818] In his 2019 New Year address, President Xi Jinping issued a threat to Taiwan, stating, "we make no promise to abandon the use of force and retain the option of taking all necessary measures."[1819] The threat was also aimed implicitly at the US, as he commented that

[1816] "U.S. Relations With Taiwan," Bureau of East Asian and Pacific Affairs, U.S. Department of State, August 31, 2018, accessed June 5, 2021, https://www.state.gov/u-s-relations-with-taiwan/
[1817] Oriana Skylar Mastro, "China's Military Modernization Program," *American Enterprise Institute*, September 4, 2019, accessed November 29, 2020, https://www.uscc.gov/sites/default/files/Panel%20II%20Mastro_Written%20Testimony.pdf
[1818] *China Military Power: Modernizing a Force to Fight and Win* (Washington, DC: Defense Intelligence Agency, 2019), 33
[1819] Teddy Ng, "China warns of Military Action against Taiwan to Block Relations with US on Eve of American Visit, *SCMP*, April 14, 2021, February 20, 2021, https://www.scmp.com/news/china/diplomacy/article/3129467/china-warns-military-action-against-taiwan-block-relations-us

China might resort to military force to forestall "external intervention."[1820] President Xi's remarks highlight the threat that China poses to the security of Taiwan. Moreover, "all necessary measures" reflect that China has kept its options open, including the use of nuclear weapons. Such a threat appears credible as China simulates an attack on Taiwan by carrying out large-scale military exercises and provoking bomber flights around Taiwan.[1821] The 2019 Defense White Paper of China notes,

> China adheres to the principles of 'peaceful reunification' and 'one country, two systems' […]. The PLA will resolutely defeat anyone attempting to separate Taiwan from China and safeguard national unity at all costs.[1822]

President Xi, in early 2019, stated that Taiwan "must and will be reunited" with mainland China.[1823] However, the people of Taiwan are culturally and politically different from China, and that is why 67 percent of respondents in a 2020 poll identified themselves as Taiwanese, and only 2.4 percent identified themselves as Chinese.[1824] Another poll showed that more than 80 percent of the respondents rejected the notion of "one country, two systems."[1825] Now that China has introduced a strict national security law in June 2020 in Hong Kong, leading to the increased exodus of protesters and human rights activists to China, it has added to increased anti-China sentiments in Taiwan.[1826] Furthermore, Taiwan's President Tsai ing-wen calls Taiwan "a sovereign independent country."[1827] However, China views it as its thirty-fourth province.[1828]

[1820] Ben Blanchard and Yimou Lee, "China's Xi Threatens Taiwan with Force but Also Seeks Peaceful 'Reunification,'" Reuters, January 2, 2019, accessed November 28, 2020, https://www.reuters.com/article/us-china-taiwan/chinas-xi-threatens-taiwan-with-force-but-also-seeks-peaceful-reunification-idUSKCN1OW04K

[1821] James E. Fannell, "Asia Rising: China's Global Naval Strategy and Expanding Force Structure," *Naval War College Review*, Vol. 72, No. 1, 8; also see Derek Grossman et al., *China's Long-Range Bomber Flights: Drivers and Implications* (Santa Monica, CA: RAND, 2018), 20-24

[1822] Full Text of 2019 Defense White Paper: "China's National Defense in the New Era" (English & Chinese Versions), July 24, 2019, accessed November 28, 2020, Full Text of 2019 Defense White Paper: "China's National Defense in the New Era" (English & Chinese Versions)

[1823] "Xi Jinping says Taiwan 'must and will be' reunited with China," *BBC News*, January 2, 2019, accessed November 28, 2020, https://www.bbc.com/news/world-asia-china-46733174

[1824] Wu Po-hsuan and William Hetherington, "Record Number Identify as 'Taiwanese,' Poll Finds," *Taipei Times*, July 5, 2020, https://www.taipeitimes.com/News/front/archives/2020/07/05/2003739375

[1825] "More Than 80 Percent of Taiwanese Reject China's 'Unification' Plan," *Radial Free Asia*, January 9, 2019, accessed November 28, 2020, https://www.rfa.org/english/news/china/more-than-80-percent-of-taiwanese-01092019115150.html

[1826] Cindy Sui, "As China tightens its grip on Hong Kong, people are leaving for Taiwan," *NBCN News*, July 3, 2020, accessed February 20, 2022, https://www.nbcnews.com/news/asia/hong-kongers-say-possible-china-repression-spurring-exodus-taiwan-n1232743

[1827] John Sudworth, "China needs to show Taiwan respect, says president," *BBC*, January 14, 2020, accessed June 17, 2021, https://www.bbc.com/news/world-asia-51104246

[1828] Alan W. Dowd, "Defending Taiwan and Deterring China," *Real Clear Defense*, September 15, 2020, accessed November 28, 2020,

The table below shows how China's defense budget has grown exponentially over the last two decades, whereas Taiwan appears to be struggling to increase its defense budget.

Table 26. China vs. Taiwan Defense Expenditure[1829]

China vs. Taiwan Defense Expenditure in Billions 2000-2020					
States	**Years**				
	2000	**2005**	**2010**	**2015**	**2020**
China	43.07	79.91	143.93	213.52	244.93
Taiwan	10.93	9.90	10.42	10.78	11.59

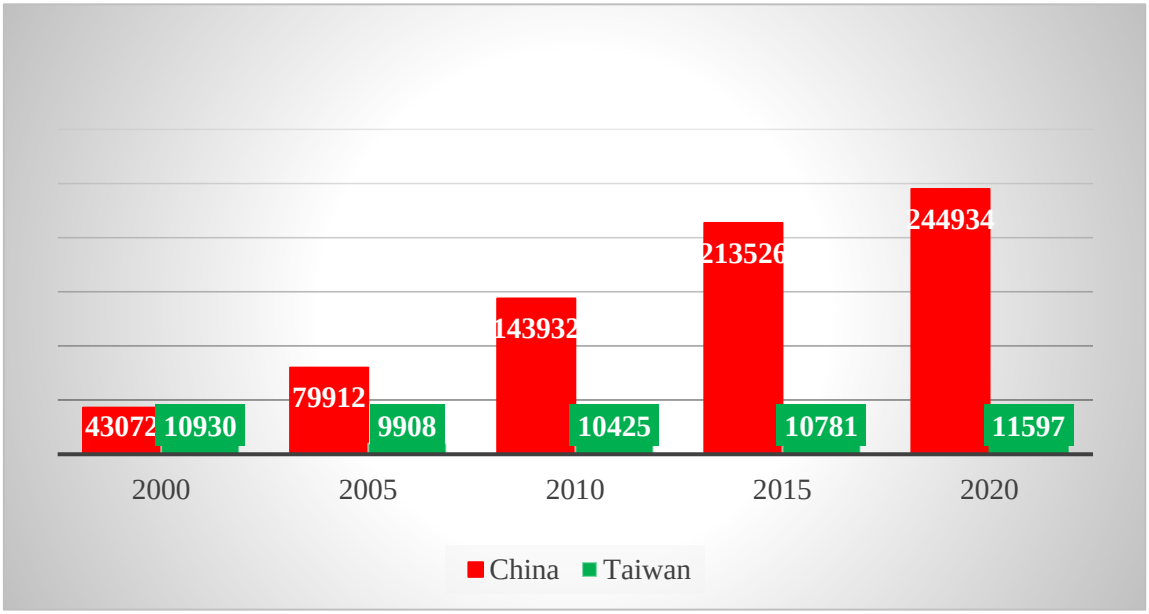

Figure 16: China vs. Taiwan Defense Expenditure 2000-2020

8.5 US and Taiwan Relations

Of all the US treaties and security relations, its treaty with Taiwan is distinctive. The US neither officially recognizes nor has formal diplomatic relations with Taiwan. The US embassy in Beijing is responsible for maintaining its relation with Taiwan via a nominally private institute known as the American Institute in Taiwan, the de-facto embassy of the

https://www.realcleardefense.com/articles/2020/09/15/defending_taiwan_and_deterring_china_577452.html

[1829] "Military expenditure by country, 1988-2019," *SIPRI, 2020*, accessed March 2, 2021, https://www.sipri.org/sites/default/files/Data%20for%20all%20countries%20from%201988%E2%80%932019%20in%20constant%20%282018%29%20USD.pdf

US in Taiwan.[1830] This makes US relations with Taiwan unique, as the latter has a security partnership with the former without having any official diplomatic relations.

Taiwan and the US, from 1954 to 1979, maintained the US-ROC Mutual Defense Treaty (MDT).[1831] The Jimmy Carter administration abolished the treaty in 1979 as a condition for establishing formal diplomatic relations with China. However, the US continued to sustain its treaty obligations under the Taiwan Relations Act (TRA), formulated in 1979 to replace the MDT.[1832] The US could not have an MDT with a state it does not recognize, so it needed an extraordinary arrangement like the TRA. The act, which after the approval of Congress is law, is legally binding and notes that,

> The Congress finds that the enactment of this Act is necessary – to help maintain peace, security, and stability in the Western Pacific; and to promote the foreign policy of the United States by authorizing the continuation of commercial, cultural, and other relations between the people of the United States and the people on Taiwan.[1833]

The US is a key element in Taiwan's security strategy, which goes back to the Taiwan Strait Crises of the 1950s discussed in Chapter Two. The TRA provides Taiwan with some level of confidence that the US will help the latter in its hour of need, even after abolishing the MDT. For the US, concerns for Taiwan's security have a special importance because Taiwan has always enjoyed political support from successive US administrations since 1979. China has felt discouraged from invading Taiwan for the past four decades because of possible US intervention.[1834] The TRA notes it is US policy,

> To consider any effort to determine the future of Taiwan by other than peaceful means, including by boycotts or embargoes, a threat to the peace and security of the Western Pacific area and of grave concern to the United States; to provide Taiwan with arms of a defensive character; and to maintain the capacity of the United States to resist any resort to force or

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[1830] "Our Relationship," The American Institute in Taiwan, accessed February 20, 2022, https://www.ait.org.tw/our-relationship/; Richard Bush, "The United States Security Partnership with Taiwan," *The Brookings Institution*, July 13, 2017, https://www.brookings.edu/wp-content/uploads/2016/11/fp_20160713_taiwan_alliance.pdf

[1831] Hsiao-Ting Lin, "U.S.-Taiwan Military Diplomacy Revisited," *Diplomatic History*, Vol. 37, No. 5 (2013), 971-994; Cal Clark, "The Taiwan Relations Act and the U.S. Balancing Role in Cross-Strait Relations," *American Journal of Chinese Studies*, Vol. 17, No. 1 (2010), 3-18

[1832] "Taiwan Relations Act," *American Institute in Taiwan*, January 1, 1979, accessed November 28, 2020, https://www.ait.org.tw/our-relationship/policy-history/key-u-s-foreign-policy-documents-region/taiwan-relations-act/

[1833] Ibid

[1834] Robert D. Blackwill and Philip Zelikow, "The United States, China, and Taiwan: A Strategy to Prevent War," *CFR*, Council Special Report No. 90, February 2021, accessed February 20, 2022, https://cdn.cfr.org/sites/default/files/report_pdf/the-united-states-china-and-taiwan-a-strategy-to-prevent-war.pdf; Harry Harding, *A Fragile Relationship: The United States and China since 1972*, (Washington, D.C.: Brookings Institution, 1992), 13-16, 82-87

> other forms of coercion that would jeopardize the security, or the social or economic system, of the people on Taiwan.[1835]

On the other hand, according to the state department website, the US, in the 1979 US-PRC joint communique, acknowledged China's position that there is one China and Taiwan is part of China, does not support Taiwan's independence, and supports peaceful resolution of cross-Strait differences.[1836] The US policy seeks to maintain the status quo on the Taiwan issue. However, the US has never mentioned how it would respond to an attempt by either side to challenge the status quo as, according to some analysts, it has maintained strategic ambiguity.[1837]

Another important element of post-1979 US-Taiwan relations was the sales of advanced military equipment to Taiwan. For instance, in 2020 the Trump administration approved $2.4 billion worth of arms sales to Taiwan.[1838] In the first term of the Obama administration, the US sold over $12 billion in military equipment.[1839] Before that, the Bush administration sold approximately $5 billion worth of arms to Taiwan.[1840] Apart from the US military equipment sold to Taiwan, one other factor that kept Taiwan safe from China's invasion was the relatively obsolete Chinese military equipment.[1841]

With the rise in China's power, some scholars have argued that the US should replace its policy of strategic ambiguity with a policy of strategic clarity, ensuring that the US would intervene if China invades Taiwan.[1842] Others have argued for a policy of dual deterrence focused on two factors.[1843] First, Taiwan should be cautioned to refrain from taking any step that may unnecessarily provoke military action by Beijing. In return, Taiwan should be assured that the US will keep supporting Taiwan. The second aspect involves

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[1835] "Taiwan Relations Act," *American Institute in Taiwan*,
[1836] "U.S. Relations with Taiwan, Bilateral Relations Fact Sheet," Bureau of East Asian and Pacific Affairs, August 31, 2018, accessed February 20, 2022, https://www.state.gov/u-s-relations-with-taiwan/
[1837] Michael O'Hanlon, "Can China Conquer Taiwan?" *International Security* Vol. 25, No. 2, (2000), 51-86; Richard Bush, "The United States Security Partnership with Taiwan"
[1838] Ellen Mitchell, "Trump Administration Approves $2.37B Arms Sale to Taiwan," *The Hill*, October 26, 2020, December 27, 2020, https://thehill.com/policy/defense/522861-trump-administration-approves-237b-arms-sale-to-taiwan
[1839] "Taiwan: Issues for Congress," *CRS*, Updated October 30, 2017, accessed February 20, 2022, https://crsreports.congress.gov/product/pdf/R/R44996
[1840] Ibid
[1841] Michael E. O'Hanlon, "What the Pentagon's New Report on China means for US strategy: Including on Taiwan, *Brookings*, September 4, 2020, accessed December 28, 2020, https://www.brookings.edu/blog/order-from-chaos/2020/09/04/what-the-pentagons-new-report-on-china-means-for-u-s-strategy-including-on-taiwan/
[1842] Richard Haass and David Sacks, "American Support for Taiwan Must Be Unambiguous," *Foreign Affairs*, September 2, 2020, accessed February 20, 2022, https://www.foreignaffairs.com/articles/united-states/american-support-taiwan-must-be-unambiguous
[1843] Richard Bush, "The United States Security Partnership with Taiwan"

cautioning China to refrain from invading Taiwan. In return, China should be assured that the US will not support the independence of Taiwan.[1844]Some have argued that both strategic clarity and the dual deterrence policy should be pursued together.[1845]

Since President Xi came to power in 2013, China has been trying to convince Taiwan to support China's longer-term objective of reunification or even an initial step such as engaging in political dialogue in that direction. However, China faces two critical problems. Firstly, Taiwan appears to have the will to resist any attempt made by China to reunify, and secondly, in the near term, China's threat has limited capacity to conduct integrated operations in this regard.[1846] Some senior US officials believe China will attempt to reunify Taiwan in the coming decade, whereas some analysts see reunification as further off.[1847] Some, like Oriana Skylar Mastro, assert that,

> The biggest threat [to Taiwan] is the day that Xi Jinping becomes confident that his military can take it successfully. At that point, it will be very difficult to deter him. But the good news is that before that point, the United States and other allies have much more room to maneuver.[1848]

Perhaps that is why Xi has set 2049 as the deadline for complete reunification because he knows that current conditions are not favorable.[1849]

According to the US DoD, military landings on the islands are "the most complicated and difficult" as they require air and maritime superiority over the adversary, a "rapid build-up," and logistics sustainability.[1850] Rugged terrain, uncertain weather, and Taiwan's

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[1844] Ibid

[1845] David Keegan, "Strengthening Dual Deterrence on Taiwan: The Key to US-China Strategic Stability," *Stimson*, July 6, 2021, accessed February 20, 2022, https://www.stimson.org/2021/strengthening-dual-deterrence-on-taiwan-the-key-to-us-china-strategic-stability/

[1846] Scott L. Kastner, Is the Taiwan Strait Still a Flash Point? Rethinking the Prospects for Armed Conflict Between China and Taiwan, *International Security*, Vol. 40, No. 3, 54-92

[1847] Hearing of Admiral Davidson, the Commander of the United States Indo- Pacific Command, Committee on Armed Services United States Senate Hearing to Receive Testimony on United States Indopacific Command in Review of the Defense Authorization Request for Fiscal Year 2022 and the Future Years Defense Program, March 9, 2021, accessed February 20, 2022, https://www.armed-services.senate.gov/imo/media/doc/21-10_03-09-2021.pdf; David Sacks, Why a Cross-Strait Crisis Will Be Averted in 2021, *CFR*, February 18, 2021, accessed February 21, 2022, https://www.cfr.org/blog/why-cross-strait-crisis-will-be-averted-2021

[1848] Breaking Down Assumptions about China's Taiwan Strategy, Stanford Freeman Spogli Institute for International Studies, *FSI News*, March 12, 2021, accessed February 21, 2022, https://fsi.stanford.edu/news/breaking-down-assumptions-about-chinas-taiwan-strategy-oriana-skylar-mastro-aspi

[1849] Full text of Xi Jinping's report at 19th CPC National Congress, *China Daily*, November 4, 2017, accessed February 21, 2022, https://www.chinadaily.com.cn/china/19thcpcnationalcongress/2017-11/04/content_34115212.htm

[1850] Annual Report to Congress: Military and Security Developments Involving the People's Republic of China 2021 (Washington, DC: Office of the Secretary of Defense, 2021), 117

defensive deployments, and China's limited sealift capabilities compound the problems it may face.[1851] However, in less than two decades, China's relative force capabilities have improved significantly. For instance, recently, in October 2020, China conducted "large-scale joint amphibious landing drills off the Chinese mainland's south-eastern coast."[1852] It was a cross-service multidimensional exercise involving state-of-the-art, amphibious, surface, and air, and land forces.[1853] Likewise, in 2002 China had approximately 350 short-range ballistic missiles (SRBMs) capable of reaching Taiwan. Now it possesses around 750-1500 SRBMs.[1854] The increasing number of SRBMs would lead to a situation favoring China, despite Taiwan's investments in BMD systems such as Patriot. Also, Taiwan's military defense expenditure has fluctuated around the same figure over the past two decades, compared to significant increases in China's defense expenditures, leading to an asymmetry in military capabilities, as shown in the table below.

Table 27. China vs. Taiwan Military Balance[1855]

China			**Taiwan**
Categories	Total	Eastern and Southern Theatres (Taiwan Strait Area)	Total
Ground Forces			
Total Ground Force Personnel (Active)	1,040,000	416,000	88,000
Tanks	6,300		800
Artillery Pieces	7,000		1,100
Naval Forces			
Aircraft Carriers	2	1	0

[1851] Michael E. O'Hanlon, Why China Cannot Conquer Taiwan, *International Security*, Vol. 25, No. 2, 57-69; For more details, please see Ian Easton, The Chinese Invasion Threat: Taiwan's Defense and American Strategy in Asia (Arlington, VA: Project 2049 Institute, 2017); Michael J. Lostumbo et al., Air Defense Options for Taiwan: An Assessment of Relative Costs and Operational Benefits (Santa Monica, CA: RAND, 2016), 202-206; Bernard D. Cole, "The Military Instrument of Statecraft at Sea: Naval Options in an Escalatory Scenario Involving Taiwan, 2007–2016," in Assessing the Threat: The Chinese Military and Taiwan's Security (eds.) Michael D. Swaine et al. (Washington, DC: Carnegie Endowment for International Peace, 2007), 187-189

[1852] Liu Xuanzun, "PLA holds amphibious landing drills to 'show firm will against Taiwan secessionists', "*Global Times*, October 10, 2020, accessed January 1, 2021, https://www.globaltimes.cn/content/1203126.shtml

[1853] Ibid

[1854] Missile Defense Project, "Missiles of China," *Missile Threat*, Center for Strategic and International Studies, June 14, 2018, last modified July 16, 2020, accessed December 31, 2020 https://missilethreat.csis.org/country/china/.

[1855] *Including fighter trainers; Office of the Secretary of Defense, "Annual Report to Congress: Military and Security Developments Involving the People's Republic of China, 2021," accessed March 10, 2021, https://media.defense.gov/2020/Sep/01/2002488689/-1/-1/1/2020-DOD-CHINA-MILITARY-POWER-REPORT-FINAL.PDF

Cruisers	1	0	0
Destroyers	32	21	4
Frigates	48	41	22
Corvettes	51	34	0
Diesel Attack Submarines	56	33	2
Nuclear Attack Submarines	9	2	0
Ballistic Missile Submarines	6	4	0
Coastal Patrol (Missile)	86	68	44
Air Force			
Fighters	1,600 (2,800)*	700 (800)*	400 (500)*
Bombers/Attack	450	250	2
Transport	400	20	30
Special Mission Aircraft	150	100	30

According to Daniel Davis, one reason for Taiwan's low defense spending is "the expectation that Americans will intervene [in case of conflict with China] in any case."[1856] However, some hold that Taiwan does not need the military capability to defeat China, rather, it needs to convince China that the price of invasion would be fearsome and that resistance would continue even if Beijing captures the island.[1857] However, China's force modernization and the 2019 DWP reflects that China aims to "resolutely defeat anyone attempting to separate Taiwan from China."[1858] The next section examines China's military-strategic guidelines, including primary and secondary strategic directions for the PLA involving Taiwan – the primary contingency.[1859]

8.6 China's Military Strategic Guidelines and Primary Contingency

China's Military Strategic Guidelines,[1860] (a military strategy document reviewed periodically), provides general guidance to the PLA on modernization and objectives such as PLA force structure, operation planning, and arms procurement and acquisition. According to David Finkelstein, the guidelines include two types of assessment; first, the

[1856] Mike Yeo, "What's preventing Taiwan from preparing for potential war?" *Defense News*, March 2, 2021, accessed February 21, 2022, https://www.defensenews.com/global/asia-pacific/2021/03/01/whats-preventing-taiwan-from-preparing-for-potential-war/; Doug Bandow, "Why Is Taiwan Only Spending 2.1 Percent of Its GDP on Its Defense?" *CATO Institute*, October 26, 2022, accessed February 21, 2022, https://www.cato.org/commentary/why-taiwan-only-spending-21-percent-its-gdp-its-defense
[1857] Bandow, "Why Is Taiwan Only Spending 2.1 Percent of Its GDP on Its Defense?"
[1858] The State Council Information Office, "China's National Defense in the New Era 2019"
[1859] Maizland, "Why China-Taiwan Relations Are So Tense."
[1860] David M. Finkelstein, "China's National Military Strategy: An Overview of the 'Military Strategic Guidelines" in *Right Sizing the People's Liberation Army: Exploring the Contours of China's Military* eds. Roy Kamphausen and Andrew Scobell (Carlisle, PA: Strategic Studies Institute, 2007), 132. Also see M. Taylor Fravel, *Active Defense: China's Military Strategy Since 1949,* (Princeton: Princeton University Press, 2019)

capability-based assessment of the PLA's operational concepts and weapons the PLA requires to meet external challenges, and second, the crisis-based assessment of challenges that are the prerequisites for the PLA to address, taking into consideration major threats and emerging changes in the geostrategic environment.[1861] China's military-strategic guidelines, further, have primary and secondary strategic directions. The primary strategic directions are related to strategically important issues and serve as worst-case scenarios, and secondary directions are related to less strategically important issues.[1862]

In terms of the crisis-based assessment, Taiwan since 1990 has been posed as the primary strategic concern of China.[1863] In the 1990s, Taiwan's political system began to undergo gradual liberalization and it saw a rise of nationalist politics. In 1996, the Taiwanese people elected a president through the popular vote for the first time, despite missile threats from China just before the election, which led to the deployment of a US aircraft carrier in the region.[1864] Taiwan became a strategically important issue primarily because of the rise of nationalists in Taiwan and the emerging trend there that sought to cement its political autonomy. Lastly, US-Taiwan defense cooperation was expanded, leading to large-scale arms sales to Taiwan during the George W. Bush administration.[1865] As then-President Bush stated in April 2001, the US would do "whatever it took to help Taiwan defend herself" and "yes, we do, [have an obligation], and the Chinese must understand that…."[1866]

Several recent developments have made Taiwan China's top strategic priority.[1867] This includes the 2016 national elections of Taiwan and the success of the pro-independence

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[1861] Ibid

[1862] Finkelstein, "China's National Military Strategy," 92; Mark Cozad, "The PLA and Contingency Planning," in *The People's Liberation Army and Contingency Planning in China*, eds. Andrew Scobell et al. (Washington, DC: NDU Press, 2015), 18-21.

[1863] M. Taylor Fravel, "Shifts in Warfare and Party Unity: Explaining China's Changes in Military Strategy," *International Security*, Vol. 42, No. 3, 50, 73-74; Edmund J. Burke and Arthur Chan, "Coming to a (New) Theater Near You: Command, Control, and Forces," in *Chairman Xi Remakes the PLA: Assessing Chinese Military Reforms*, ed. Phillip C. Saunders et al. (Washington, DC: NDU Press, 2019), 251

[1864] "Timeline: Taiwan's road to democracy," *Reuters*, December 13, 2011, accessed February 21, 2022, https://www.reuters.com/article/us-taiwan-election-timeline-idUSTRE7BC0E320111213

[1865] Lawrence E. Grinter, "Handling the Taiwan Issue: Bush Administration Policy Toward Beijing and Taipei," *Asian Affairs: An American Review*, Vol. 29, No.1, (2002), 6; Joel Wuthnow, "System Overload: Can China's Military Be Distracted in a War over Taiwan?" *China Strategic Perspective*, No 15, https://ndupress.ndu.edu/Portals/68/Documents/stratperspective/china/china-perspectives-15.pdf; T.Y. Wang, "Taiwan's Foreign Relations Under Lee Teng-hui's Rule, 1988–2000," *American Asian Review*, Vol. 20, No. 1, (2018), 71-106

[1866] David E. Sanger, "U.S. Would Defend Taiwan, Bush Says," *New York Times*, April 26, 2001, accessed December 1, 2020, https://www.nytimes.com/2001/04/26/world/us-would-defend-taiwan-bush-says.html

[1867] Wuthnow, "System Overload", 7

Democratic Progressive Party (DPP), in which their candidate, Tsai Ing-wen, was elected and subsequently re-elected in the 2020 elections.[1868] Moreover, the weakening of general support for unification with China in Taiwan, the failure of the pro-China Kuomintang (KMT) party, and KMT's next-generation of leaders' rising anti-China views, and the growth of China's military power relative to Taiwan have reduced China's tendency to believe it can reunify Taiwan peacefully.[1869] According to the Taiwanese Public Opinion Foundation (TPOF), 56 percent of Taiwanese support independence, 23 percent the status quo, and 12.5 percent favor unification with China.[1870] Additionally, according to the National Chengchi University survey 2020, more than 64 percent of Taiwanese identified themselves as Taiwanese, 30 percent identified as both Taiwanese and Chinese – a percentage that has reduced by 10 percent over a decade. Only approximately 3 percent called themselves Chinese.[1871] Under such circumstances, the chances of peaceful unification appear to be diminishing, and the possibility of military intervention by China to reunify Taiwan with the mainland has been growing, in turn raising the prospect of a US-China clash over the island.

In a 2020 interview, John Mearsheimer said, "I believe the United States will fight to defend Taiwan if China invades Taiwan. In my opinion, it's unthinkable that the United States would stand by and allow China to conquer Taiwan."[1872] Some analysts, such as Patrick Porter and Michael Mazarr believe that the US should clarify that aggression is unacceptable, but those who are emphasizing a more substantial US security commitment to Taiwan overstate the strategic outcome of China's successful invasion. Porter and Mazarr maintain that "the stakes are not so high as to warrant an unqualified US pledge to go to war."[1873] Nonetheless, based on the assumption that the US may go to war over Taiwan, China's military doctrinal development focuses on the types of military campaigns necessary for such an eventuality. These include joint strikes on Taiwan's

[1868] "Taiwan Election: Tsai Ing-wen wins Second Presidential Term, *BBC News*, January 11, 2020, accessed February 21, 2022, https://www.bbc.com/news/world-asia-51077553
[1869] Ibid
[1870] Huang Tzu-ti, "Poll shows Highest Ever Support for Taiwan Independence," *The Taiwan News*, June 22, 2020, accessed February 21, 2022, https://www.taiwannews.com.tw/en/news/3951560
[1871] Maizland, "Why China-Taiwan Relations Are So Tense"
[1872] Kenji Minemura, "INTERVIEW/ John Mearsheimer: U.S.-China rift runs real risk of escalating into a nuclear war," *The Asahi Shimbun*, August 17, 2020, accessed November 28, 2020, http://www.asahi.com/ajw/articles/13629071
[1873] Patrick Porter And Michael Mazarr, "Countering China's Adventurism over Taiwan: A Third Way," *Lowy Institute Analysis*, May 2021, accessed February 21, 2022, https://www.lowyinstitute.org/sites/default/files/PORTER%20MAZARR%20Taiwan%20Third%20Way%20COMPLETE%20PDF%20V1.pdf

critical infrastructure, a naval blockade, large-scale Island invasion to compel Taiwan to submit to China's proposal "one country, two systems" policy.[1874] To support these campaigns, China is rapidly modernizing its military forces, particularly those relevant to campaigns against Taiwan, such as short-range ballistic and cruise missiles, advanced aircraft, and amphibious operation units and deploying them in the region with proximity to Taiwan.[1875] Balancing and countering the ability of the US to intervene in different scenarios is an inherent part of Beijing's strategy, and China's military force modernization, including nuclear force modernization, underscores how these capabilities could be used to deter US intervention.[1876]

8.6.1 **Current Situation**

China, since September 2020, has increased its provocative actions in and around the Taiwan Strait more than at any time in the past 25 years. According to one report, since September 9, 2020, "about 30 incursions by PLA Air Force planes and seven by Navy vessels were detected in an area southwest of Taiwan…, with Chinese planes entering Taiwan's ADIZ for at least 21 times."[1877] The median line between China and Taiwan is subject to continuous breaches, which was mutually respected for decades until 2019.[1878] With the mounting uncertainty and growing tension across the Taiwan Strait, an increasing number of US policymakers[1879] and analysts[1880] have been calling on the US to make an explicit pledge to Taiwan's security. The basis of these calls is several bipartisan laws enacted in the last two years to strengthen US support for Taiwan.[1881] In 2018, the US Congress approved two laws: the "Taiwan Travel Act," allowing government-level exchanges between the US and Taiwan; and the "Taiwan International Participation Act," advocating for Taiwan's participation in international

[1874] Wuthnow, System Overload, 7-8
[1875] Dennis J. Blasko, *The Chinese Army Today: Tradition and Transformation for the 21st Century*, (New York: Routledge, 2012), 185-190
[1876] The Science of Military Strategy 2013; *The Science of Campaigns* English Translation (Beijing, National Defense University, 2006); Wuthnow, System Overload, 8
[1877] Micheal Mazza, "Signaling from Chinese Military Exercises around Taiwan," *Global Taiwan Institute*, October 7, 2020, accessed December 3, 2020, https://www.aei.org/articles/signaling-from-chinese-military-exercises-around-taiwan/
[1878] Ibid
[1879] H.R.7855 - Taiwan Invasion Prevention Act, 16th Congress (2019-2020), accessed December 3, 2020, https://www.congress.gov/bill/116th-congress/house-bill/7855?s=1&r=7
[1880] Richard Haass and David Sacks, "American Support for Taiwan Must Be Unambiguous," *Foreign Affairs*, September 2, 2020, accessed December 3, 2020, https://www.foreignaffairs.com/articles/united-states/american-support-taiwan-must-be-unambiguous
[1881] Ralph Jennings, "Why US Lawmakers Introduce Bill After Bill to Help Taiwan," *VOA*, August 4, 2020, accessed December 3, 2020, https://www.voanews.com/east-Indo-Pacific/why-us-lawmakers-introduce-bill-after-bill-help-taiwan

organizations.[1882] In 2019, the US Congress passed "the Taiwan Allies International Protection and Enhancement Initiative Act" to strengthen Taiwan's diplomatic relations with US allies in the Indo-Pacific.[1883]

Compared with China, the Taiwan military is 1/10th the size, as indicated in Table 27 above. China's PLA Air Force (PLAAF) is the largest in Asia, and its army, navy, and conventional missile force are the largest in the world, respectively dwarfing the size of Taiwan's forces.[1884] China has air defense capabilities that can intercept aircraft inside Taiwanese airspace. China's PLA Rocket Force (PLARF) and PLAAF could probably eliminate Taiwan's air force and navy, but the question is how quickly it could do this; could it do it in time to prevent a rapid US intervention?[1885] It also can target US military bases in East Asia, such as Guam, and bases in South Korea and Japan.[1886] China is investing heavily in the navy, and since 2015, its Navy has become larger than the US Navy. In 2020, China's PLAN had battle forces of 350 ships, whereas the US had approximately 293.[1887] In short, the asymmetry in military power across the Taiwan Strait is growing in favor of China.[1888]

In the nuclear realm, Taiwan is a latent nuclear power, and according to some estimates, it would take Taiwan between eight and ten years to develop a complete nuclear warhead if it follows a systemic approach as India and Pakistan have, but if Taiwan embarks upon a crash course, it would be able to produce a crude device in two years.[1889] It has two nuclear power plants that could produce plutonium. In 1970, Taiwan enriched weapons-

[1882] Ibid
[1883] Ibid
[1884] Office of the Secretary of Defense, "Military and Security Developments Involving the People's Republic of China, 2020 Annual Report to Congress," accessed December 3, 2020, https://media.defense.gov/2020/Sep/01/2002488689/-1/-1/1/2020-DOD-CHINA-MILITARY-POWER-REPORT-FINAL.PDF
[1885] Michael Beckley, "In Future Wars, the U.S. Military Will Have Nowhere to Hide," *Foreign Policy*, November 20, 2019, accessed December 3, 2020, https://foreignpolicy.com/2019/11/20/russia-china-increasingly-able-attack-united-states-bases-networks-war/
[1886] Ibid
[1887] Michael E. O'Hanlon, "What the Pentagon's New Report on China means for US Strategy: including on Taiwan," *Brookings*, September 4, 2020, accessed January 3, 2021, https://www.brookings.edu/blog/order-from-chaos/2020/09/04/what-the-pentagons-new-report-on-china-means-for-u-s-strategy-including-on-taiwan/
[1888] "Monitoring the Cross-Strait Balance Taiwan's Defense and Security," *Annual Taiwan Democracy and Security Project Workshop Report*, September 2019, accessed December 1, 2020, https://www.kharistempleman.com/uploads/1/5/8/5/15855636/monitoring_the_cross-strait_balance.pdf
[1889] Mark Fitzpatrick, "Taiwan, Asia's latent nuclear powers: Japan, South Korea and Taiwan," *Adelphi Series*, Vol. 55, Issue 455, 142; Taiwan Overview, *NTI*, may 27, 2015, accessed February 22, 2022, https://www.nti.org/analysis/articles/taiwan-overview/

grade plutonium for nuclear weapons but later gave it up under US pressure.[1890] However, Taiwan kept a nuclear weapons program covert until the 1980s.[1891] Certainly, a nuclear-armed Taiwan would raise the costs of a Chinese invasion hugely. Perhaps, that is why some analysts suggest the US help Taiwan acquire nuclear weapons.[1892] It is important to mention here that the US has no formal commitment to Taiwan to provide extended nuclear deterrence, unlike its commitment to South Korea and Japan. However, the US maintains strategic ambiguity deliberately over its involvement in a possible Taiwan Strait Crisis, which has its own strategic utility.[1893] The situation could lead to a Cuban Missile Crisis scenario, with both sides deploying nuclear weapons and standing "eyeball to eyeball" against each other.[1894] China would have strong conventional superiority over Taiwan because of their geographical proximity (as the US had over Cuba).[1895] And, also, the popular support in China due to the notion that Taiwan's fate is a "core interest" for China (like the US had popular support at home against communist Cuba).[1896] Therefore, there is a possibility of a reversed Cuban Missile Crisis, wherein the US (like Russia) is forced to abandon Taiwan after as its commitment crashes against the harsh reality of MAD.

China is conducting military exercises across the strait to prepare PLA to deal with any eventuality involving Taiwan and the US. The PLAAF conducted simulation attacks on the US air force base in Guam in 2020; an area strategically important for the US to provide logistical and military support for Taiwan.[1897] The PLAAF conducted another

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[1890] Alex Littlefield and Adam Lowther, "Would a Nuclear-Armed Taiwan deter China?" *ASPI*, December 24, 2020, accessed June 5, 2021, https://www.aspistrategist.org.au/would-a-nuclear-armed-taiwan-deter-china/; Doug Bandow, "Should We go to War for Taiwan?" *CATO Institute*, April 15, 2021, accessed June 5, 2021, https://www.cato.org/commentary/should-we-go-war-taiwan

[1891] Ibid

[1892]Ibid; Bradley Bowman and Andrea Stricker, "Arm Taiwan: But Skip the Nukes," *Foreign Policy*, August 4, 2020, accessed December 2, 2020, https://foreignpolicy.com/2020/08/04/taiwan-military-aid-nuclear-weapons/

[1893] Richard C. Bush, "Thoughts on the Taiwan Relations Act," *Brookings*, April 21, 2009, accessed January 4, 2021, https://www.brookings.edu/opinions/thoughts-on-the-taiwan-relations-act/

[1894] James M. Lindsay, "TWE Remembers: Eyeball to Eyeball and the Other Fellow Just Blinked (Cuban Missile Crisis, Day Nine)," *CFR*, October 24, 2012, accessed February 22, 2022, https://www.cfr.org/blog/twe-remembers-eyeball-eyeball-and-other-fellow-just-blinked-cuban-missile-crisis-day-nine

[1895] Lyle J. Goldstein, "Storm Clouds are Gathering over the Taiwan Strait," *The National Interest*, July 18, 2018, accessed February 22, 2022, https://nationalinterest.org/feature/storm-clouds-are-gathering-over-taiwan-strait-26146

[1896] Ibid

[1897] Thomas Newdick, "Chinese Air Force Video Depicting Bombers Attacking Guam Steals Scenes from Transformers, *The Drive*, September 21, 2020, accessed December 5, 2020, https://www.thedrive.com/the-war-zone/36598/chinese-air-force-video-depicting-bombers-attacking-guam-steals-scenes-from-transformers

simulation attack on USS Theodore Roosevelt (carrier strike group) in 2021 by intruding into Taiwan's ADIZ with 28 fighter aircraft, including eight H-6 bombers.[1898] Former US State Department top official under President Obama, Daniel Russel, is convinced that "the strongest driver of increased Chinese assertiveness is the conviction that the Western system, and the U.S. in particular, is in decay."[1899]

Such views are based on China's military capabilities growing faster than expected by many, including the Pentagon. China's successful nuclear-capable HGV test also included an unprecedented launch of a separate missile from the HGV in mid-flight over the SCS, flying at five times the speed of sound.[1900] Also, China launched four medium-range ballistic missiles into the South China Sea in a military exercise in August 2020.[1901] According to *SCMP*, the DF26 and the DF-21D (the 'carrier-killer') were test-fired during this time.[1902] According to the *Global Times*, the exercise involved coordinated saturated attacks based on missiles fired from different directions at a target and a system that involves detecting, tracking, and target-lock on enemy ships.[1903] The missile system "possibly consists of reconnaissance aircraft, radar, satellites and warships among others, [that] can direct and coordinate missiles to find moving maritime targets, so they can adjust their trajectories when initiating the final attacks after re-entry."[1904] The DF-21D, according to recent research and analysis, is a "multi-purpose" missile, with a

[1898] Peter Suciu, "China's H-6 Bombers Simulate Attack on U.S. Air Force Base," *The National Interest*, December 29, 2021, accessed February 22, 2022, https://nationalinterest.org/blog/reboot/chinas-h-6-bombers-simulate-attack-us-air-force-base-198325

[1899] Samson Ellis, "Here's What Could Happen If China Invaded Taiwan," *Bloomberg*, October 8, 2020, accessed February 22, 2022, https://www.bloomberg.com/news/features/2020-10-07/here-s-what-could-happen-if-china-invaded-taiwan

[1900] Demetri Sevastopulo, "Chinese hypersonic weapon fired a missile over South China Sea," *FT*, November 22, 2021, accessed February 22, 2022, https://www.ft.com/content/a127f6de-f7b1-459e-b7ae-c14ed6a9198c

[1901] Liu Zhen, "Why China brought out the 'Aircraft-Carrier Killer' to flex its Military Muscle," *SCMP*, August 28, 2020, accessed January 4, 2021, https://www.scmp.com/news/china/military/article/3099157/why-china-brought-out-aircraft-carrier-killer-flex-its-military; Ankit Panda, "Closer Look at the PLARF's DF-26," *The Diplomat*, May 19, 2020, accessed December 6, 2020, https://thediplomat.com/2020/05/a-closer-look-at-the-plarfs-df-26/; Joshua H. Pollack and Scott LaFoy, "China's Df-26: A Hot-Swappable Missile?" *Arms Control Wonk*, May 17, 2020, accessed December 6, 2020, https://www.armscontrolwonk.com/archive/1209405/chinas-df-26-a-hot-swappable-missile/; P.W. Singer and Ma Xiu, "China's ambiguous missile strategy is risky," *Popular Science*, May 11, 2020, accessed December 6, 2020, https://www.popsci.com/story/blog-network/eastern-arsenal/china-nuclear-conventional-missiles/

[1902] Liu Xuanzun, "Reported PLA Anti-Ship Ballistic Missile Launches 'show Saturated Attack Capability'," *Global Times*, August 27, 2020, accessed June 5, 2021, https://www.globaltimes.cn/content/1199110.shtml

[1903] Ibid

[1904] Liu Xuanzun, "Reported PLA Anti-Ship Ballistic Missile Launches 'show Saturated Attack Capability'," *Global Times*, August 27, 2020, accessed June 5, 2021, https://www.globaltimes.cn/content/1199110.shtml

maneuverable warhead and accuracy of 20m CEP.[1905] It is capable of carrying "at least four types of warhead (nuclear, conventional sub-munitions, conventional penetrator, and thermobaric)" and with "hot-swappable" capability; a feature that enables a quick replacement of payload attached to the ready-to-launch missile.[1906] Moreover, the US 2021 DoD report on China notes that the H-6J bomber (a maritime derivative of H-6K) can carry six supersonic anti-ship cruise missiles (ASCMs), allowing the PLAN to carry out saturated attacks on the US Navy in the South China Sea.[1907]

Top decision-makers and senior officials of the Trump administration, such as former National Security Advisor John Bolton (2018-2019), wanted the administration to recognize Taiwan's independence to show resolve and commitment.[1908] Richard Haass and David Sacks have also argued that the US should openly declare it would intervene to deter a Chinese invasion of Taiwan. Moreover, they view that a failed attempt to unify Taiwan is a risk that President Xi is not likely to take, as it will put China's prestige and power in danger.[1909] Therefore, the invasion of Taiwan in the short term is unlikely so long as the US commits to Taiwan security with strategic clarity. In a crisis where a US military intervention would be imminent, China would be under immense pressure to lean on nuclear deterrence to offset the US involvement and prevent a worst-case scenario of having to back down in a crisis of conflict given it would place the Chinese Communist Party at risk of losing power.

Since 2005, China has been trying to convince the US that in conflict over Taiwan, it is prepared to escalate to the nuclear level if necessary.[1910] In that scenario, China's DF-17, a dual-capable hypersonic ballistic missile, the DF-16, DF-21, and DF-26 medium-range missiles signal China's determination to establish intra-war deterrence in the Taiwan Strait. Moreover, China's recently discovered missile silos fields are a force multiplier. Though there is a collaboration between the US and Taiwan at multiple levels, it is unclear whether the US would directly involve itself in a cross-Strait crisis as it did in the mid-1990s when China was relatively military weak. If US policymakers are convinced that

[1905] "DF-21," in *IHS Jane's Weapons: Strategic 2015-2016*, ed. James C. O'Halloran (United Kingdom: IHS, 2015), 15-17
[1906] Ibid
[1907] Secretary of Defense, "Annual Report to Congress 2021," 81
[1908] K. G. Chan, "US should diplomatically recognize Taiwan: Bolton," *Asia Times*, July 9, 2020, accessed December 6, 2020, https://asiatimes.com/2020/07/us-should-diplomatically-recognize-taiwan-bolton/
[1909] Richard Haass and David Sacks, "American Support for Taiwan Must Be Unambiguous"
[1910] Paul Dodge, "China's Naval Strategy and Nuclear Weapons: The Risks of International and Inadvertent Nuclear Escalation," *Comparative Strategy*, Vol. 24, No. 5, (2005), 415

direct involvement is in their interests, they might prepare for a regional nuclear contingency. It is likely that against this backdrop, the US 2018 NPR focuses on regional nuclear warfighting scenarios and proposes building new capabilities and modernizing nuclear weapons and delivery means.

The Biden administration has signaled that it will carry forward the Trump administration's great power competition policy, but with greater emphasis on a multilateral approach that actively consults allies and partners.[1911] In April 2021, President Biden and Japanese PM Yoshihide Suga highlighted the significance of peace and stability across the Taiwan Strait in a joint statement following the US-Japan leadership summit.[1912] It was the first such reference to Taiwan in the summit since the 1972 normalization of China and Japan diplomatic ties.[1913] Japan's Defense Minister has called for democratic countries "to defend Taiwan as a democratic country."[1914]

China's nuclear and conventional force modernization has increased insecurity in Northeast Asia, raised the chance of nuclear conflict in the region, and triggered the US to react by increasing its support for Taiwan and other regional allies. Policymakers in the US cannot ignore the notion that if US' strategic ambiguity fails and a nuclear crisis and escalation scenarios occurs, Washington could expose itself to a nuclear crisis. Ultimately, we do not know how the US would respond until a crisis or conflict broke out over Taiwan; even US leaders themselves may not know, and their reaction will be contingent upon the specific context.

8.7 Conclusion

China's nuclear weapons force modernization has significant strategic implications for the Indo-Pacific region, particularly for states with strategic importance for China, such as India and Taiwan. Disputes with both states are more than half a decade old. The unification of Taiwan with mainland China is the primary national objective of China; at worst, for China, Taiwan could declare independence and/or station US military forces

[1911] Fareed Zakaria, "TV Program GPS," *CNN*, accessed January 4, 2021, https://edition.cnn.com/videos/tv/2021/01/03/exp-gps-0103-sullivan-on-his-personal-life-and-outlook.cnn
[1912] "The Taiwan Factor in US–Japan Alliance Relations," *East Asia Forum*, September 6, 2021, accessed October 17, 2021, https://www.eastasiaforum.org/2021/09/06/the-taiwan-factor-in-us-japan-alliance-relations/
[1913] Ibid
[1914] Anthony Kuhn, "After Being Silent For Decades, Japan Now Speaks Up About Taiwan: And Angers China," *NPR*, August 2, 2021, accessed February 23, 2022, https://www.npr.org/2021/07/26/1020866539/japans-position-on-defending-taiwan-has-taken-a-remarkable-shift

on its territory. Similarly, India is another contentious front China must deal with, and if relations between China, the US, and its allies were to deteriorate to the point of conflict, India could play a major role in helping support a US-alliance. China would be likely to find itself outmatched if it had to fight on multiple fronts, and India could be one of those fronts.

India and Taiwan are aligned under the US security framework for the region. Each of these states has a unique status, and their geographical locations form layers of defense against China. Taiwan forms the innermost layer, covering the South China Sea, whereas India, along with the US, covers the outermost layer, which could be controlling China's access to the Indian Ocean region.

China's military modernization in general and nuclear force modernization, in particular, can destabilize the Indo-Pacific region and could lead to the outbreak of nuclear proliferation throughout the region. This and the previous chapters have explained that South Korea, Japan, and Taiwan are latent nuclear powers. Given the inherent limitations of US extended nuclear deterrence and its increasing vulnerabilities, China's military advancements, and decreasing security of the regional states, there is a growing chance that states with nuclear latency may go nuclear and states with nuclear weapons capability may reduce the nuclear use threshold. Such changes are visible in the region, as discussed above in the case of India. It appears that China's nuclear weapons force modernization, which may be based on what it views as defensive intentions, is generating a security dilemma and intensifying competition, generating an arms race and undermining strategic stability.

Conclusion

With the advent of nuclear weapons in 1945, the fundamental nature of conflict and war between nuclear-armed powers was transformed and states came to be highly concerned about the nuclear capabilities of their rivals. As such, the changes in the nuclear weapons use policy, doctrine, and force of a major nuclear-armed state has implications that can be regional and even global: this especially applies to China as an emerging superpower. The primary research question of this thesis asked: What accounts for the emergence of China's nuclear program, what has propelled it since its inception, and what are the implications of its evolution for regional and global security? Using neoclassical realism as a framework of analysis, the scholarship argues that China's nuclear weapons program was initially driven by fears and threats derived from its external strategic environment. The US nuclear threat and blackmail during the Korean War and Cross-Strait Crises in the 1950s shaped China's initial nuclear threat perception and led it to build nuclear weapons. This was identified in Chapter Two which outlined the historical evolution of China's nuclear weapons program. China tested nuclear weapons in 1964; however, China's first IRBM/ICBM, the DF-4 with a range of 4500-5500km, entered into service in 1980, and the DF-5 with 13,000km range entered into service in 1981.[1915] The US and the USSR's intense bipolar security competition, which reduced China's threat perception given the superpowers prioritized one another in their strategic calculations, led to the late development of strategic missile delivery vehicles by China. The 1967-1978 Cultural Revolution also significantly hampered the development of China's nuclear weapons program.[1916] In other words, there was not a sufficient external or structural threat to China for many years, and internal factors held China back from developing a full-scale nuclear weapons program.

What propelled China's nuclear weapons force modernization (the second aspect of the primary question) after the end of the Cold War? The research finds this was related to both structural and internal factors, discussed in Chapters Three and Four. The end of the Cold War brought China more squarely onto the world stage. The Tiananmen Square

[1915] Missile Defense Project, "DF-4 (Dong Feng-4 / CSS-3)," *Missile Threat*, Center for Strategic and International Studies, October 26, 2017, last modified November 26, 2019, accessed March 10, 2021, https://missilethreat.csis.org/missile/df-4/; Missile Defense Project, "DF-5 (Dong Feng-5 / CSS-4)," *Missile Threat,* Center for Strategic and International Studies, August 12, 2016, last modified November 18, 2019, accessed March 10, 2021, https://missilethreat.csis.org/missile/df-5-ab/

[1916] Michael S. Minor, "China's Nuclear Development Program," *Asian Survey*, Vol. 16, No. 6 (1976), 571-579

incident was a blow to its diplomatic and economic relations, which had implications for its economic growth, but this passed as China's economic growth exploded, and it became the largest trade partner for many states.

Since the economic reforms of 1979 to 2018, China's economy grew through the following decades at an average of approximately ten percent annually, although it has begun to slow in recent years (5.95% in 2019 and 2.2%, in 2020; however in the last quarter of 2021 it grew to 8.1%).[1917] China's fast-growing economy was seemingly vulnerable to the sole superpower whose military superiority it witnessed during the First Gulf War; the US, presumably had it wanted to, Washington could have greatly constrained China's economic rise by limiting its options. However, the US elected to pursue a policy of engagement with Beijing in the expectation that as China liberalized its economy, democracy would follow. Indeed, US policy and strategy facilitated Beijing's rise, as it paved the way for China to join the WTO.[1918] China's fast-growing economy provided a financial base for its military modernization, particularly for expensive ICBMs and SSBNs that are maturing now. Apart from the economy, internal factors, such as bureaucratic/organizational politics and particularly idiosyncratic political leaders' approaches, such as President Xi's *China Dream*, have placed China's comprehensive nuclear force modernization on the fast-track and made it part of national reforms to regain China's 'lost' international prestige (from what it called the century of humiliation).[1919]

China is comprehensively modernizing its nuclear weapons forces and may be altering its retaliatory nuclear doctrine to one shifting closer to nuclear warfighting, though it remains more limited for the time being. The examination of the impact of its modernization in this thesis shows that with this level of nuclear force modernization, particularly the emergence of sea-based nuclear forces, China could give up its longstanding NFU for a launch-on-warning posture because SSBNs would require the delegation of authority in the nuclear missile launching decision-making process, as

[1917] Jonathan Cheng, "China GDP Grew 8.1% in 2021, Though Momentum Slowed in Fourth Quarter," *The Wall Street Journal*, January 16, 2022, https://www.wsj.com/articles/china-gdp-grew-8-1-in-2021-though-momentum-slowed-in-fourth-quarter-11642386349#:~:text=The%208.1%25%20growth%20figure%20for,expansion%20in%20coronavirus%2Dravaged%202020.

[1918] Hongyi Harry Lai, "Behind China's World Trade Organization Agreement with the USA," *Third World Quarterly*, Vol. 22, No. 2, (2001), 237-255

[1919] "Xi Focus: Xi stresses racing against time to reach Chinese Dream," *Xinhua Net*, January 23, 2020, accessed March 20, 2021, http://www.xinhuanet.com/english/2020-01/23/c_138729706.htm

China operates a fleet of six SSBNs, (see Chapter Five).[1920] And according to some Chinese experts, giving up NFU for a launch-on-warning is still consistent with NFU.[1921] China is building an entirely new fleet of next-generation SSBNs (Type-96) and SLBMs (JL-3), which will have significant strategic implications.[1922] The development of new missile silos fields also puts pressure on China's NFU policy.

The primary research question also inquires about the implication of China's nuclear weapons force modernization for international and regional nuclear security and strategic stability. The research found it has manifold implications. China's comprehensive nuclear force modernization under Xi is a compelling reason to believe the purely defensive nature of China's nuclear doctrine and force is changing, leading to what Jervis calls offense dominance in a security dilemma. He writes "[w]hen there are incentives to strike first, a successful attack will usually so weaken the other side that victory will be relatively quick, bloodless, and decisive."[1923] Stephen Van Evera also holds that when the offense has an advantage over the defense, "aggression brings larger rewards at lower cost."[1924] Glaser and Chaim Kaufmann and other scholars believe that under an offense dominance scenario "war will be quick and decisive and therefore profitable."[1925] Jervis also holds that "because wars are expected to be both frequent and short, there will be incentives for high levels of arms, and quick and strong reaction to the other's increases in arms."[1926] Therefore, understanding these emerging changes in China's nuclear weapons program is important as it has significant ramifications for international peace and security, as this thesis explored in Chapters Six, Seven, and Eight.

The opening up and reforms introduced by Deng in the late 1970s led to China's economic growth and rise as a major power. The emergence of a unipolar world order that resulted

[1920] Kristensen and Korda, "Chinese Nuclear Force," 444
[1921] Author discussion with Chinese analyst
[1922] Funaiole, Bermudez Jr. and Hart, "A Glimpse of Chinese Ballistic Missile Submarines," Michael Schuman, "China Now Understands What a Nuclear Rivalry Looks Like," *The Atlantic*, February 17, 2022, accessed February 23, 2022, https://www.theatlantic.com/international/archive/2022/02/china-russia-nuclear-weapons/622089/
[1923] Jervis, "Cooperation under the Security Dilemma," 189
[1924] Stephen Van Evera, *Causes of War: Power and the Roots of Conflict*. (Ithaca, NY: Cornell University Press, 1999), 123
[1925] Charles L. Glaser and Chaim Kaufmann. "What is the Offense-Defense Balance and Can We Measure It?" *International Security*, Vol. 22, No. 44 (1998), 48; Ivan S. Bloch, The Future of Wars (New York, NY: Double day and McClure, 1899), xxx-xxxi; Basil Liddell Hart, "Aggression and the Problem of Weapons," *The English Review*, Vol. 55, No. 71 (1932), 72-74; Robert Gilpin, *War and Change in World Politics* (Cambridge: Cambridge University Press, 1981), 60-63; George H. Quester, *Offense and Defense in the International System* (New York: John Wiley, 1977), 9-10
[1926] Jervis, "Cooperation under the Security Dilemma," 189

from the USSR collapse, the US swift military victory in the 1991 Gulf War, and the Tiananmen Square incident were significant incidents that pushed China towards military modernization. Though China has been increasing and modernizing its military for the past three decades, nuclear weapons force modernization has risen in importance since 2015, coinciding with a period of increased assertiveness by China.[1927] As analyzed in Chapter Five, President Xi Jinping has catalyzed China's nuclear force modernization by making it part of national reforms, helping him avoid internal criticism. His national rejuvenation dream has seemingly accelerated China's pace towards becoming a power capable of fighting and winning major wars.[1928]

China's Nuclear Strategy

According to official documents, China's nuclear weapons use policy is based on the nuclear deterrent role of nuclear weapons associated with its NFU pledge, development of lean and effective nuclear forces emphasizing the sufficiency of nuclear weapons to retaliate against a nuclear attack, and centralized nuclear command and control.[1929] China's nuclear inventory is based on a small number of nuclear weapons, though it is growing fast. China's nuclear weapons inventory increased from 240 to 320 between 2012 to 2020.[1930] According to the 2006 DWP, China maintains a self-defensive nuclear strategy.[1931] The objective is to deter adversaries from carrying out a nuclear attack against China and to stop states from nuclear blackmailing or coercing China, using the

[1927] China Power Team. "How is China Modernizing its Nuclear Forces?" *China Power*. December 10, 2019. Updated October 28, 2020. Accessed March 19, 2021. https://chinapower.csis.org/china-nuclear-weapons/

[1928] Xinhua, "China Focus: "'Be ready to win wars",' China's Xi orders reshaped PLA," *Xinhua Net*, August 1, 2017, accessed February 14, 2021, http://www.xinhuanet.com//english/2017-08/01/c_136491455.htm

[1929] Sun Xiangli, "China's Nuclear Strategy: Nature and Characteristics," *World Economics and Politics*, No. 9, 28, (2006); Yao Yunzhu, "China's Perspective on Nuclear Deterrence," *Air & Space Power Journal* No. 23, No. 4, 9-11; Li Bin, "Identifying China's Nuclear Strategy," *World Economics and Politics*, No. 9, 16-22(Spring 2010); Gao Yan, "From Local War Under the High-Tech Conditions to the Assured Destruction Under Nuclear Situation: China's Current Military Strategy Should Turn to the Comprehensive Nuclear Deterrence," *Tianya Forum*, July 2004, http://bbs.tianya.cn/post-worldlook-101455-1.shtml.; State Council Information Office, "China's National Defense in the New Era," *White Paper*, July 24, 2019, accessed January 26, 2020, http://www.scio.gov.cn/zfbps/32832/Document/1660314/1660314.htm, also see "China Strategic Missile Force Encyclopedia 2012," 10-11; and China's State Council Information Office, "China's Nuclear Defense Strategy, Beijing, December 2006"

[1930] "SIPRI Yearbook 2020, Nuclear weapon modernization continues but the outlook for arms control is bleak: New SIPRI Yearbook out now", June 15, 2020, accessed February 15, 2021, https://www.sipri.org/media/press-release/2020/nuclear-weapon-modernization-continues-outlook-arms-control-bleak-new-sipri-yearbook-out-now

[1931] Information Office of the State Council of the People's Republic of China, "China's National Defense in 2006," December 2006, accessed December, 11, 2021, http://en.people.cn/whitepaper/defense2006/defense2006.html

threat of nuclear weapons as examined in Chapter Two. China's nuclear weapons strategy centers on deterrence via assured retaliation. The doctrine of assured retaliation allows China to keep nuclear forces on a low level of alertness, keeping nuclear warheads and missiles in a de-mated position.

China's defensive nuclear weapons use strategy is consistent with its NFU pledge, which has been a part of China's strategy since 1964, when it first tested nuclear weapons. The 2006 DWP, which is the most comprehensive paper of its kind, and the 2019 DWP, reiterate China's long-held stance that it will not use or threaten nuclear weapons against non-nuclear state or nuclear-weapons-free-zones (NWFZ), and China will not enter into a nuclear arms race. China maintains unconditional NFU; however, a critical examination of China's nuclear strategy, which is also one of the main objectives of the thesis, shows that many analysts are skeptical of China sustaining its NFU. They fear that China may not follow NFU in specific scenarios, such as if Chinese forces fail to defend a large-scale invasion, a conventional attack on nuclear bases and infrastructure poses a significant threat to its strategic nuclear forces, and if achieving China's national objectives, which includes reunification with Taiwan, are threatened.[1932] Such a situation creates ambiguity about China's nuclear threshold, that is, what circumstances would provoke a nuclear response from China. Moreover, the recent DoD report on Military and Security Developments Involving the People's Republic of China (2021) and the newly discovered silo fields make it clear that China is racing to catch up to the US. So, a new arms race may be in the offing. These changes and capabilities make more sense as China intends to build what Mathew Kroenig calls a "robust nuclear force."[1933]

The 2019 DWP of China contains significant changes from the previously released DWPs. It has departed from using the term "limited development of nuclear weapons" to now stating China will seek a "minimum level of nuclear capabilities." This change highlights two crucial aspects, as evaluated critically in Chapter Five. The 2019 Defense White Paper focuses on nuclear capabilities, including the building of miniaturized nuclear

[1932] Nan Li, "China's Evolving Nuclear Strategy: Will China Drop "'No First Use?'", *China Brief*, Vol. 18, Issue: 1, (2018) https://jamestown.org/program/chinas-evolving-nuclear-strategy-will-china-drop-no-first-use/; For a summary of anti-NFU views, see Major General Jin Yi'nan's (金一南) lecture at https://www.youtube.com/watch?v=cYpj3OsoOSw; Joseph Kahn, "Chinese General Threatens Use of A-Bombs if US Intrudes," *New York Times*, July 15, 2005, accessed June 2, 2021, https://www.nytimes.com/2005/07/15/washington/world/chinese-general-threatens-use-of-abombs-if-us-intrudes.html; Zhao Xijun, *Intimidation Warfare: A Comprehensive Discussion of Missile Deterrence* (Beijing: National Defense University Press, 2005), 2-3

[1933] "The Logic of American Superiority," 4

weapons for SLBMs, ALCMs, ALBMs, and hypersonic glide vehicles, such as the DF-17. To support this argument, one official report released by China's government and reviewed by *South China Morning Post* notes that China, between September 2014 to December 2017, carried out around 200 tests to simulate nuclear blasts.[1934]

The second aspect is related to the change in nuclear policy. The *limited development of nuclear weapons* is based on acquiring counterforce warfighting capabilities solely to deter.[1935] In contrast, the emphasis on *the minimum level of nuclear capabilities*, which concurs with the classic notion of minimum deterrence, relates to the concept that nuclear weapons have "the single function of threatening adversary cities to deter nuclear use."[1936]

Also, unlike in 2006, the 2019 DWP lacks reference to lean and effective nuclear forces, which refers to the importance of a limited but effective nuclear weapons capability. The ongoing nuclear weapons force modernization requires a significant increase in nuclear weapons to, if necessary, fight and win great wars. In contrast, the 2013 *Science of Military Strategy* notes, "the existence of the device itself is a deterrent."[1937] It appears Beijing has concluded that the existence of a small number of nuclear devices is no longer sufficient to guarantee deterrence and support its growing interests and ambitions. This generates suspicion over China's intentions, how China's nuclear weapons policy will evolve in the years to come, and, ultimately increases concerns that China's recent assertion, salami slicing, and expansion of its interests will continue as nuclear weapons capability continues to increase. Beijing's leaders may feel more confident in further expanding their ambitions and territorial claims.

China's Existing Nuclear Weapons Force Capabilities

One of the primary objectives of this thesis is to analyze the change in the nuclear weapons doctrine of China against the backdrop of its nuclear modernization. Historically,

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[1934] Stephen Chen, "China Steps Up Pace in New Nuclear Arms Race with US and Russia as Experts Warn of Rising Risk of Conflict, May 28, 2018, accessed March 13, 2020, https://www.scmp.com/news/china/society/article/2147304/china-steps-pace-new-nuclear-arms-race-us-and-russia-experts-warn

[1935] James Mulvenon, "Chinese and Mutually Assured Destruction: Is China Getting "MAD? "in ed. Henry D. Sokolski *Getting MAD: Nuclear Mutual Assured Destruction, Its Origins and Practice,* (Carlisle, PA: Strategic Studies Institute (SSI) of the U.S. Army War College, November 2004), 241.

[1936] Liping Xia, China's Nuclear Doctrine: Debates and Evolution, June 30, 2016, accessed March 13, 2020, https://carnegieendowment.org/2016/06/30/china-s-nuclear-doctrine-debates-and-evolution-pub-63967; James Mulvenon et al., *Chinese Responses to U.S. Military Transformation and Implications for the Department of Defense* (Santa Monica, CA: RAND Corporation, 2006), 97

[1937] China Focus: "'Be ready to win wars,' China's Xi orders reshaped PLA"; *Science of Military Strategy*, 172-173

land-based ICBMs have played the role of a primary force, ensuring China's nuclear deterrence is credible. By the early 2000s, China began to field road-mobile ICBMs to supplement silo-based DF-5s. The DF-5 has three variants, all with the same range but different payload capacities. The DF-5A can carry a single warhead, the DF-5B is capable of carrying three warheads, and the DF-5C is capable of carrying ten warheads.[1938] Later in 2006, the land-based road-mobile DF-31 and its variant, the DF-31A in 2007, were fielded with ranges of 8,000km and 11,700km, respectively.[1939] China also fields DF-21D and DF-26 anti-ship missiles, (carrier killers). China also has 18 deployed DF-41 missiles capable of carrying 10 MIRV-ed warheads and of reaching the continental US.[1940] More DF-41s are in the development phase. Recently, new missile silo fields have been discovered that are capable of holding more than 300 additional missiles, and experts believe that China may have more silo fields yet to be detected.[1941] According to some experts, the silos are likely to hold the DF-41.[1942]

Table 28. China's Nuclear Forces 2021[1943]

Chinese Land-based Nuclear Forces					
Type/Designation	**No of launchers**	**Year deployed**	**Range (KM)**	**Warhead x yield1 (kilotons)**	**No of warheads**
DF-4	5	1980	5,500+	1 x 3,300	6
DF-5A	10	1981	12,000	1 x 4,000-5,000	10
DF-5B	10	2015	13,000	5 x 200-300	50
DF-5C	n.a.	(2020)	13,000	MIRV	--
DF-15	?	1990	600	1 x ?	--
DF-17	(18)	(2021)	1,800+	1xHGV	--
DF-21 A/E	40	2000, 2016	2,100+	1 x 200-300	40
DF-26	100	2016	4,000	1 x 200-300	20
DF-31	6	2006	7,200	1 x 200-300	6
DF-31A	36	2007	11,200	1 x 200-300	36
DF-31AG	36	2018	11,200	1 x 200-300	36

[1938] Missile Defense Project, "DF-5 (Dong Feng-5 / CSS-4)," *Missile Threat*, Center for Strategic and International Studies, August 12, 2016, last modified November 18, 2019, accessed February 16, 2021, https://missilethreat.csis.org/missile/df-5-ab/.
[1939] Missile Defense Project, "DF-5 (Dong Feng-5 / CSS-4)," *Missile Threat*, Center for Strategic and International Studies, August 12, 2016, last modified November 18, 2019, https://missilethreat.csis.org/missile/df-5-ab/.
[1940] Missile Defense Project, "DF-41 (Dong Feng-41 / CSS-X-20)," *Missile Threat*, Center for Strategic and International Studies, August 12, 2016, last modified October 8, 2019, accessed February 16, 2021, https://missilethreat.csis.org/missile/df-41/.
[1941] Kristensen and Korda, "Nuclear Notebook: Chinese nuclear forces," 2021
[1942] Shannon Bugos and Julia Masterson, "New Chinese Missile Silo Fields Discovered," *Arms Control Association*, September 2021, accessed October 17, 2021, https://www.armscontrol.org/act/2021-09/news/new-chinese-missile-silo-fields-discovered
[1943] Kristensen and Korda, "Nuclear Notebook: Chinese nuclear forces," 2021

DF-41	18	2021	12,000	3x200-300	54
Subtotal	280				258
Chinese Submarine-launched Ballistic Missiles					
JL-2	6/72	2016	7000+	1 x 200–300	72
JL-3		2025	9000+	MIRV-capable	
Chinese Strategic Bomber					
H-6	20	1965/2009	3100+	1 x bomb (1 x ALBM)	20

The table above, show Hans Kristensen and Matt Korda's very conservative calculation of China's Nuclear Forces in 2021 which concluded that China has approximately 350 nuclear warheads. For instance, it is said that the DF-41 can carry ten warheads, but they have accounted for only three warheads each, and the rest are attributed to being seven for decoys and penetration aids.[1944] It can be asked why China would risk employing three warheads when a missile can carry ten warheads, which will increase the level of destruction and reduce the probability of interception? A worst-case scenario suggests that China's proven inventory of DF-41 (18) would carry 180 warheads, 126 warheads more than the 350 suggested above, making a total of 476.

Table 29. China's Missile Silo Fields Capability[1945]

Type/Designation	No of launchers	Year deployed	Range (KM)	Warhead x yield1 (kilotons)	No of warheads
New Silo Fields (DF-41)	300+		12,000	3x200-300 – 10x200-300	900-3,000

The discoveries of missile silos noted in the table above are in addition to these capabilities. Moreover, China is trying to acquire full-spectrum deterrence, which involves deterrence against threats ranging from sub-conventional to the strategic level (adding nuclear rungs to the escalation ladder), engaging both counter-value and counterforce targets, as discussed in Chapter Five.

Similarly, they have not considered the warheads required for the JL-3 SLBM, which was tested four times in 2018 and 2019.[1946] The JL-3, according to Chinese state media, is

[1944] Kristensen and Korda, "Nuclear Notebook: Chinese nuclear forces," 2021
[1945] Ibid
[1946] Sebastien Roblin, "China Touts New Submarine-Launched Nukes In Quest For More Survivable Deterrence," *Forbes*, May 13, 2020, accessed February 16, 2021, https://www.forbes.com/sites/sebastienroblin/2020/05/13/china-touts-new-submarine-launched-nukes-in-quest-for-more-survivable-deterrence/?sh=622638c81755

equivalent to the French M51, which is capable of carrying 4-6 warheads.[1947] Also, according to different reports, the Type-96 SSBN would be ready for deployment by the mid-2020s, and each may carry between 16-24 JL-3 SLBMs. Additionally, a simple increase in the number of missiles such as DF-41, DF-5C or JL-3, would have a multiplier effect on the number of warheads. The H-20, China's strategic bomber, will also be ready by 2025 for operational deployment with a possible range of 8,500km.[1948] A realist worst-case scenario analysis would suggest that the number of nuclear warheads, in reality, could be higher than the numbers shown in Table 29. According to this research, the estimated nuclear warheads of China might be around 476. This total is based on the calculation that China's ICBMs are loaded with warheads to their maximum capacity.

Table 30. Estimated Nuclear Warheads - A Worst-Case Scenario

Total	**Number of Launchers**	**Warheads**
Kristensen and Korda, 2021		
Total	372	350
This study		
Total	372 (DF-41 18 [10x200-300])	350 + 126
	300+ DF-41 (10x200-300)	9,000
Total with the new silos		9,476

Some anticipated the increase in China's nuclear weapons inventory long before recent developments. For example, in May 2019, the director of the Defense Intelligence Agency (DIA) Lt. Gen. Robert P. Ashley, Jr. stated, "Over the next decade, China is likely to at least double the size of its nuclear stockpile in the course of implementing the most rapid expansion and diversification of its nuclear arsenal."[1949] However, the US 2021 DoD report on China notes that the total number of warheads could increase to 1,000 by 2030. On the contrary, once the missile silos fields are operational, certainly before 2030, the number of nuclear warheads could increase 19 times as per the nature and type of ICBM (likely DF-41). This estimate does not include the warheads required for SLBM JL-3 and

[1947] Kristensen and Korda, "Chinese Nuclear Forces 2020," 443-457

[1948] Kristin Huang, "Why the New H-20 Subsonic Stealth Bomber could be a Game Changer for China," *SCMP*, October 21, 2018, accessed February 16, 2021, https://www.scmp.com/news/china/military/article/2169472/why-new-h-20-subsonic-stealth-bomber-could-be-game-changer-china

[1949] Lt. Gen. Robert P. Ashley, Jr., Director Defense Intelligence Agency Russian and Chinese Nuclear Modernization Trends, *Remarks at the Hudson Institute*, May 29, 2019, accessed February 17, 2021, https://www.dia.mil/News/Speeches-and-Testimonies/Article-View/Article/1859890/russian-and-chinese-nuclear-modernization-trends/

new missile bases under construction for road-mobile missile launchers.[1950] Moreover, the 2019 DWP notes that,

> In line with the strategic requirements of having both nuclear and conventional capabilities and deterring wars in all battlespaces, the PLARF is enhancing its credible and reliable capabilities of nuclear deterrence and counterattack, strengthening intermediate and long-range precision strike forces, and enhancing strategic counter-balance capability, so as to build a strong and modernized rocket force.[1951]

The reference above to all battlespaces suggests China seeks full-spectrum deterrence, and the second reference to enhancing strategic counter-balance capability reflects China's aims to enhance its strategic capabilities to a level where it can counter-balance adversaries. This highlights that PLARF's strategic requirements are closely connected to the strategic capabilities of Beijing's adversaries, especially the US.

Drivers of Change

According to neoclassical realists, the systemic incentives/factors are primary drivers of state behavior compared to internal factors, which are secondary.[1952] Based on these assumptions, China's large-scale military modernization, particularly its nuclear weapons force modernization, is primarily driven by external factors. However, internal factors have also played an important yet secondary role, as discussed critically in Chapter Four.

External Drivers

External drivers mainly involve the US, as China perceives nuclear threats to come primarily from the US. China's threat perception, after the Korean War and Cross-Strait Crises, was elevated again after the Cold War. It initiated general military modernization after it witnessed the US decisive victory in the First Gulf War. And while the post-George H. W. Bush administrations until Obama did not abandon the China engagement policy, assuming that China would eventually democratize internally. Things began to change during Obama's second term. The military modernization in China gained momentum after the Obama administration's rebalancing strategy in 2011 was announced and it initiated a series of steps to expand and intensify the already significant role of the

[1950] Kristensen and Korda, "Nuclear Notebook: Chinese Nuclear Forces," 2021
[1951] The State Council Information Office of the People's Republic of China, "China's National Defense in the New Era," July 2019 accessed February 17, 2021, http://www.china-un.ch/eng/dbtyw/cjjk_1/cjjzzdh/t1683060.htm
[1952] Gideon Rose, "Neoclassical Realism and Theories of Foreign Policy," *World Politics*, Vol. 51, No. 1, (1998), 154

US in the Indo-Pacific region.[1953] With President Xi in office from 2013, nuclear weapons force modernization became part of China's comprehensive national reforms; reforms that Xi views as critical to his legacy and the rise of China to superpower status.

The US maintains a nuclear inventory of 1650 strategic warheads and a diverse delivery platform based on ICBMs, SSBNs, and strategic bombers.[1954] It also possesses some 180 TNWs at overseas bases. The US is currently pursuing a comprehensive nuclear force upgrade and modernization plan estimated at a cost of $1.7 trillion over the next 30 years, starting from 2017 and running to 2046.[1955] This is being spent on the nuclear weapons delivery systems of the triad, nuclear command and control systems, and nuclear warheads. It is important to note that the 2018 NPR also intends to develop several new nuclear weapons capabilities, such as the near-term development of low-yield SLBMs, long-term development of a new nuclear SLCM, and a new nuclear role for F-35.[1956] These new developments suggest a greater tactical role for US nuclear arms, aimed at limited nuclear warfighting, in accordance with the first-use nuclear policy of the US. The US can deploy these forces in the Indo-Pacific region, from Guam and Hawaii, and its sea-based platforms, without any support from regional allies, can confront China.[1957] The US is also pressing its allies, such as South Korea and Japan, to deploy US' medium and intermediate-range missiles to add another layer of missiles.[1958]

[1953] Mark E. Manyin, Stephen Daggett, Ben Dolven, Susan V. Lawrence, Michael F. Martin, Ronald O'Rourke and Bruce Vaughn, "Pivot to the Pacific? The Obama Administration's "Rebalancing" Toward Asia," *CRS*, March 28, 2012, accessed February 7, 2022, https://sgp.fas.org/crs/natsec/R42448.pdf

[1954] Hans M. Kristensen & Robert S. Norris "United States Nuclear Forces, 2018," *Bulletin of the Atomic Scientists*, Vol. 74, No. 2, (2018), 120-131

[1955] Ibid

[1956] Office of the Secretary of Defense, "Nuclear Posture Review 2018," accessed February 17, 2021, https://media.defense.gov/2018/Feb/02/2001872886/-1/-1/1/2018-NUCLEAR-POSTURE-REVIEW-FINAL-REPORT.PDF

[1957] Christopher P. Twomey, "Chinese-U.S. Strategic Affairs: Dangerous Dynamism," *Arms Control Association*, accessed March 17, 2021, https://www.armscontrol.org/act/2009-01/features/chinese-us-strategic-affairs-dangerous-dynamism; Jen Judson, "Congress makes Moves to fund Additional Terminal-Phase Missile Defense Battery, *Defense News*, November 10, 2020, accessed March 17, 2021, https://www.defensenews.com/pentagon/2020/11/10/congress-makes-moves-to-fund-additional-terminal-phase-missile-defense-battery/

[1958] Park Chan-kyong, "US arms control envoy presses South Korea on missile deployment to counter China," *SCMP*, September 28, 2020, accessed February 23, 2022, https://www.scmp.com/week-asia/politics/article/3103380/us-arms-control-envoy-presses-south-korea-missile-deployment; Jeffrey W. Hornung and Scott W. Harold, "Japan's Potential Acquisition of Ground-launched Land-attack Missiles"; Jesse Johnson, "The U.S. wants Japan's help to close its 'Missile Gap' with China. Is Tokyo up for it?" *The Japan Times*, August 25, 2019, accessed February 24, 2022, https://www.japantimes.co.jp/news/2019/08/25/national/politics-diplomacy/u-s-wants-japans-help-close-missile-gap-china-tokyo/

Other than the US nuclear force threat, China also feels threatened by the US BMD system and the Precision Guided Strike (PGS) system. In November 2020, the US Missile Defense Agency (MDA) announced that a Standard Missile 3 (SM-3) Block IIA interceptor had successfully engaged an ICBM in a test for the first time.[1959] Such a capability has serious implications for strategic stability and future arms race dynamics. Driven in part by North Korea's ICBM capability demonstrated in 2017, the MDA initially suggested that the SM-3 Block IIA would be capable of engaging ICBMs. However, after a successful test against an ICBM on November 16, 2020, the agency explicitly denied that the interceptor was designed to defend the US against ICBMs.[1960]

The China and Russian threat perception emanates from the forty-four Ground-Based Midcourse Defense GMD interceptors deployed by the US, but now, after the successful SM-3 Block IIA test, the US plans to increase the number of interceptors up to sixty-four by 2023.[1961] This would pose a serious threat to China's relatively limited ICBM capabilities. In a worst-case scenario, China can lose only 48 out of its 92 ICBMs in a first strike, as the remaining forty four could be intercepted by the US BMD systems before they reached the US.[1962] Even China's SSBNs with the JL-2 cannot target the US as they are considered to operate in designated areas (bastion sea – as part of a strategy to secure a strike option by keeping SSBNs close to China's coastal waters to keep them safe from adversary's ASW capabilities, guarded by attack submarines), and it would need to move deep into the Pacific given the JL-2 has a range of 7000km.[1963] China's SSBNs have to transit through the choke-points (extending through the Ryukyus, a chain of islands scattered along the north and south of Taiwan, or through the Bashi Channel, a waterway between Taiwan and the Philippines)[1964] to operate in the Pacific, making them

[1959] "U.S. successfully conducts SM-3 Block IIA Intercept Test against an Intercontinental Ballistic Missile Target," US Department of Defense, November 17, 2020, accessed February 18, 2021, https://www.defense.gov/Newsroom/Releases/Release/Article/2417334/us-successfully-conducts-sm-3-block-iia-intercept-test-against-an-intercontinen/

[1960] Ankit Panda, "A New U.S. Missile Defense Test may have increased the Risk of Nuclear War," *CEIP*, November 19, 2020, accessed February 18, 2021, https://carnegieendowment.org/2020/11/19/new-u.s.-missile-defense-test-may-have-increased-risk-of-nuclear-war-pub-83273

[1961] "Current U.S. Missile Defense Programs at a Glance," *Arms Control Association*, August 2019, accessed March 16, 2021, https://www.armscontrol.org/factsheets/usmissiledefense

[1962] Hans M. Kristensen and Matt Korda, "China's Nuclear Forces," *Bulletin of the Atomic Scientists 2020*, Vol. 76, No. 6, (2020), 444

[1963] Ibid; Tong Zhao, *Tides of Change: China's Nuclear Ballistic Submarines and Strategic Stability* (Washington, DC: Carnegie Endowment for International Peace, 2018); Owen Cote, "Invisible Nuclear-Armed Submarines, or Transparent Oceans? Are Ballistic Missile Submarines still the Best Deterrent for the United States?" *Bulletin of the Atomic Scientists*, Vol. 75, No. 1, (2021), 30-35

[1964] Zhao, Tides of Change, 36

detectable and vulnerable to the US and Japanese ASW systems.[1965] Similarly, the US intention and effort to develop a Conventional Prompt Strike (CPS) capability, which is not yet mature, inform China's threat perception. Official US documents have discussed CPS as seeking to achieve four objectives: preventing an emerging/rogue nuclear weapons state from launching a nuclear attack; neutralizing anti-satellite weapons (ASAT); challenging anti-access/area-denial capabilities (A2/AD) of the adversary; and eliminating high-value non-state-actors and disrupting their operations.[1966] Aditionally, the US is developing Long-Range Hypersonic Weapon (LRHW) systems and Hypersonic Attack Cruise Missiles (HACM), which will be ready for development by 2023.[1967] Together, these capabilities inform China's nuclear threat perception. However, with the operationalization of missile silo fields and the next generation of SSBNs, China should be able to overcome the US BMD challenge. China has responded by developing the world's most advanced HGV. According to some reports, on July 27, 2021, China has tested a nuclear-capable HGV that circled the globe before striking the target.[1968] It was launched by a 'Long-March' (space rocket) fractional orbital bombardment system (FOBS).[1969] According to General Mark A. Milley the HGV test was "very close" to a Sputnik moment (a moment that shocked the US establishment into realizing that in the area of a potentially game-changing technology, here hypersonic missile technology, the

[1965] Toshi Yoshihara and James R. Holmes, China's New Undersea Nuclear Deterrent: Strategy, Doctrine, and Capabilities, *Joint Forces Quarterly*, Vol. 50, No. 3 (2008); Zhao, Tides of Change, 35-37

[1966] U.S. Department of Defense, Nuclear Posture Review Report (Washington, DC: US Department of Defense, April 2010), x, accessed January 25, 2020, http://www.defense.gov/npr/docs/2010%20Nuclear%20Posture%20Review%20Report.pdf. Also, see David Alexander and Andrea Shalal, 'Experimental U.S. hypersonic weapon destroyed seconds after launch', *Reuters*, August 25, 2014, accessed January 25, 2020, http://www.reuters.com/article/2014/08/25/us-usa-military-hypersonic-idUSKBN0GP1ED20140825.
Also, see U.S. Department of Defense, Military and Security Developments Involving the People's Republic of China 2014, Annual Report to Congress (Washington, DC: Office of the Secretary of Defense, 2014), 30-32, accessed January 25, 2020, http://www.defense.gov/pubs/2014_DoD_China_Report.pdf. Also, see The 2012 Joint Operational Access Concept (JOAC), which stressed the important of capability to target deep inside adversary's territory including targets such as logistics, command and control nodes, and strategic and operational reserves. U.S. Department of Defense, Joint Operational Access Concept (JOAC), Version 1.0, 24. January 10, 2012, accessed January 25, 2020, http://www.defense.gov/pubs/pdfs/JOAC_Jan%202012_Signed.pdf. Also, see US Department of Defense, Time Critical Strike from Strategic Standoff, Report of the Defense Science Board Task Force (Washington, DC: 2009), 2, accessed January 25, 2020, http://www.acq.osd.mil/dsb/reports/ADA498403.pdf

[1967] Hypersonic Weapons: background and Issues for Congress, 9

[1968] Shannon Bugos, China Tested Hypersonic Capability, U.S. Says, *Arms Control Today*, November 2021, accessed December 12, 2021, https://www.armscontrol.org/act/2021-11/news/china-tested-hypersonic-capability-us-says#:~:text=China%20has%20tested%20a%20nuclear,sources%20told%20the%20Financial%20Times.

[1969] Demetri Sevastopulo and Kathrin Hille, "China tests New Space Capability with Hypersonic Missile," *FT*, October 16, 2021, accessed February 23, 2022, https://www.ft.com/content/ba0a3cde-719b-4040-93cb-a486e1f843fb.

US may very well be behind China).[1970] Earlier, China used ballistic missiles to launch HGVs. But the Long-March-based nuclear-capable HGV capability provides China with a space-based global-strike capability.[1971] China's HGV program represents its own nascent CPS capability, the US is striving to deploy this CPS capability by 2028.[1972]

In China's threat perception, India is second to the US. Though China maintains an edge over India in the nuclear domain, researchers in China are apprehensive about the strategic partnership India has with the US, which could be a game-changer in the region. The Indo-US civil-nuclear deal, which violates the NPT and US support for India to access the Nuclear Suppliers Group (NSG) to access dual-use nuclear technologies through a country-specific wavier without IAEA comprehensive safeguards in place, shows the US' commitment to supporting nuclear India against China.[1973] This allows India to redirect its existing uranium stockpiles and dual-use goods to its military program.[1974] The strategic partnership also includes military agreements, such as the Logistic Support Agreement 2016, allowing both states to use each other's military facilities, the Communications Compatibility and Security Agreement 2018 to increase interoperability through secure and encrypted communication and, recently, they signed the Basic Exchange and Cooperation Agreement 2020, allowing both states to share all kinds of military intelligence, such as, "geomagnetic and gravity data, maps, nautical and aeronautical charts, commercial and other unclassified imagery."[1975] Moreover, with the

[1970] Sanne Verschurenoctober, "China's Hypersonic Weapons Tests don't have to be a Sputnik Moment," *War on the Rocks*, October 29, 2021, accessed January 14, 2022, https://warontherocks.com/2021/10/chinas-hypersonic-missile-tests-dont-have-to-be-a-sputnik-moment/

[1971] Greg Hadley, "Kendall: China has Potential to Strike Earth from Space," *Air Force Magazine*, September 20, 2021, accessed February 24, 2022, https://www.airforcemag.com/global-strikes-space-china-frank-kendall/.

[1972] "Hypersonic Weapons: Background and Issues for Congress," 9

[1973] Ian Stewart and Adil Sultan, "India, Pakistan and the NSG," *News Centre King's College,* June 10, 2019, accessed March 16, 2021, https://www.kcl.ac.uk/news/india-pakistan-and-the-nsg; Article I, The nuclear Non-Proliferation Treaty (NPT), states "Each nuclear-weapon State Party to the Treaty undertakes not to transfer to any recipient whatsoever nuclear weapons or other nuclear explosive devices or control over such weapons or explosive devices directly, or indirectly; and not in any way to assist, encourage, or induce any non-nuclear-weapon State to manufacture or otherwise acquire nuclear weapons or other nuclear explosive devices, or control over such weapons or explosive devices." Treaty on the Non-Proliferation of Nuclear Weapons (NPT), Officer of the Disarmament Affairs, UN, https://www.un.org/disarmament/wmd/nuclear/npt/

[1974] Mansoor Ahmed, "India's Nuclear Exceptionalism: Fissile Materials, Fuel Cycles and Safeguards, Discussion Paper, Managing the Atom Project," *Belfer Centre for Science and International Affairs*, Harvard Kennedy School, May 2017, accessed February 126, 2021, https://www.belfercenter.org/sites/default/files/files/publication/India%27s%20Nuclear%20Exceptionalism.pdf

[1975] Snehesh Alex Philip, "The 3 Foundational Agreements with US and what they mean for India's Military Growth," *The Print*, October 27, 2020, accessed march 16, 2021, https://theprint.in/defense/the-3-foundational-agreements-with-us-and-what-they-mean-for-indias-military-growth/531795/

QUAD in place, India will have greater access to ISR capabilities and other resources, enhancing its operational capabilities and capacity. With these agreements in place, Indian naval forces can operate with greater freedom in the South China Sea and at entry routes between the South China Sea and the Indian sea. India, as such, would be likely to contribute to US naval efforts to blockade and fight China in the event of a major naval clash. The Indian navy can now refuel from US platforms, can access secure communications in joint military exercises with the US, Japan, and Australia, and its land and air forces have access to real-time satellite-based intelligence and surveillance of China's forces deployed on its border region. In return, the US now has access to India's military bases to facilitate its operations in the Indian Ocean, a region of strategic importance for China's SLC and for its trade and energy imports.

After recent border clashes with China in July 2020, India carried out as many as ten missile tests from September 2020 to October 14, 2020.[1976] It continues to modernize its nuclear inventory to operationalize its nascent nuclear triad. India has approximately 150 nuclear weapons.[1977] However, according to International Panel on Fissile Material 2018, India has produced approximately 600 kilograms of weapon-grade plutonium, which is enough to meet the needs of around 150-200 nuclear warheads.[1978]

India operates between three to four squadrons of the Mirage 2000H, and the Jaguar IS fighter aircraft for nuclear strike purposes. India also possesses a range of missiles capable of targets inside China, such as Agni-II with a range of 2000km deployed in Northern India and Agni-III with a range of 3,200km, if deployed in the northeastern part of India, would be able to target Shanghai.[1979] Agni-IV has a range of 3,500km, and once fully operational, it would be capable of engaging targets anywhere in China from northeastern India. India is also developing the Agni-V with a range of more than 5,000km. The Agni-V would allow India to target anywhere in China from central or southern India. In the sea-based nuclear domain, India operates two SSBNs, the INS Arihant and the INS Arighat (to be operational in 2022), and aims to expand the SSBN fleet by adding two

[1976] Saurabh Joshi, "Missile Tests, Border Roads set India's Tone to China, *StratPost*, October 13, 2020, accessed February 24, 2022, https://stratpost.com/missile-tests-border-roads-set-indias-tone-to-china/; "India test-fires 10 Missiles in 35 days. It is not a Coincidence," *The Hindustan Times*, October 29, 2020, accessed December 1, 2021, https://www.hindustantimes.com/india-news/india-races-to-upgrade-its-armoury-fires-a-missile-every-4-days/story-UB5RQaMY4zVlTlYbNFR8EL.html
[1977] Kistensen and Korda, "Indian Nuclear Forces, 2020"
[1978] Ibid
[1979] Ibid

more SSBNs (temporarily code-named the S4 and S4*) by 2024.[1980] According to Kristensen and Korda, India also seems to be working on the S5; a next-generation SSBN.[1981] Apart from SSBNs, India is modernizing its SLBMs that include K-4 with an expected range of 3,500km, giving India access to China from the Bay of Bengal. Overall, such ambitious modernization plans would require a significant increase in India's number of nuclear weapons. The Indian nuclear triad, hence, holds an important position in the strategic calculus of China, second only to the US.

Other non-nuclear weapons states such as Japan and South Korea, enjoy US extended nuclear deterrence and have security guarantees from the US, also informing China's nuclear threat perception. Additionally, Taiwan has an informal security arrangement with Washington, while the US has a mutual security treaty with South Korea and Japan. The US has around 50,000 troops stationed in Japan for the latter's protection. It has installed Aegis and Patriot BMD systems in Japan and the Terminal High Altitude Area Defense (THAAD) system in South Korea. Chinese officials have conveyed serious concerns over these deployments, particularly over the THAAD batteries, as they have advanced radars capable of undermining strategic stability.[1982] The following section focuses on the internal drivers of change in China's nuclear weapons force modernization.

Internal Factors

Internal factors primarily involve China's economic growth, which led to increases in China's defense budget. Since 2000, China's defense budget as a share of its GDP has floated around 2 percent. However, its GDP has multiplied over the years.

[1980] Kistensen and Korda, "Indian Nuclear Forces, 2020"
[1981] Ibid, 222
[1982] Ethan Meick and Nargiza Salidjanova, "China's Response to U.S.-South Korean Missile Defense System Deployment and its Implications (report)," *U.S.-China Economic and Security Review Commission*, July 26, 2017, accessed May 13, 2021, https://www.uscc.gov/sites/default/files/Research/Report_China%27s%20Response%20to%20THAAD%20Deployment%20and%20its%20Implications.pdf

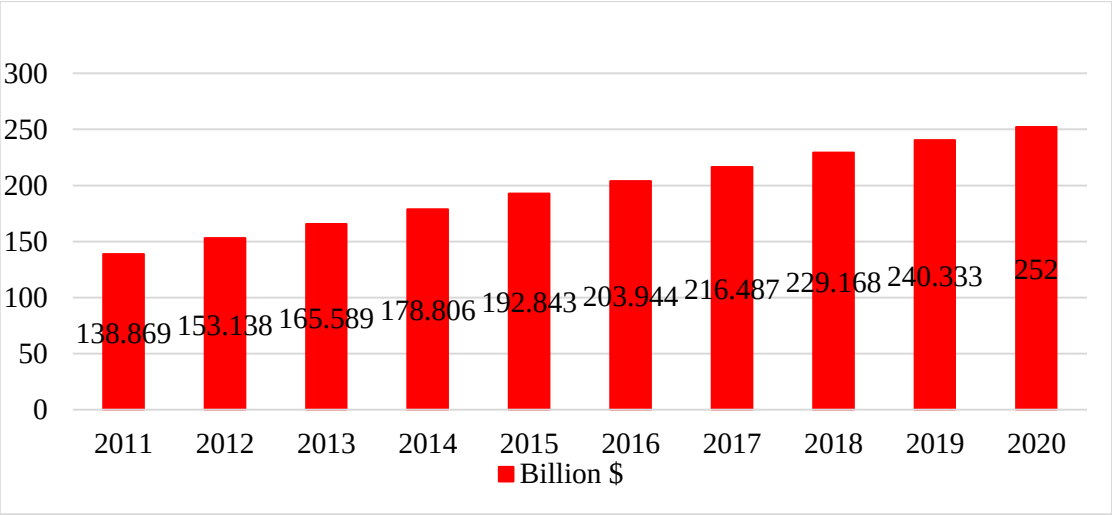

Figure 17: China's Defense Budget 2010-2020[1983]

China's defense budget for 2020-2021 has grown at the slowest rate in the past three decades, mainly because of the global Covid pandemic.[1984] However, the defense budget still grew by approximately 6.6 percent from fiscal year 2019.[1985] Other internal factors that led to China's nuclear weapons force modernization include organizational/bureaucratic processes and operations, and leadership commitment to China's nuclear forces. The emergence of organizational/bureaucratic processes and operational SOPs are a factor in driving requirements for new policies associated with nuclear force modernization, as discussed in Chapter Four. These factors will also play a significant role in the future. For instance, the military bureaucracy and officials associated with the expanding SSBNs, fleet and the expanding commingled conventional and nuclear missile units could pressure the government to establish a new set of wartime operating procedures because of the lack of firewalls between the two missile forces, initiating a chain reaction of changes in other policies and strategies.

Similarly, President Xi's "Chinese dream of national rejuvenation" announced on October 18, 2017, has significant implications for China's nuclear weapons force modernization as he has linked military modernization efforts to broader national reforms.[1986] Earlier nuclear modernization was considered part of China's general

[1983] "Military Expenditure by Country 2021," *SIPRI*,
[1984] Yew Lun Tian, "China Defense Spending Rise at Three-Decade Low, still to grow 6.6%," *Reuters*, May 22, 2020, accessed February 17, 2021, https://www.reuters.com/article/us-china-parliament-defence-idUSKBN22Y081
[1985] Ibid
[1986] Wuthnow and Saunders, "Chinese Military Reforms in the Age of Xi Jinping"; Bai Zonglin, "Perspective on China's Military Reform"; Ziyu Zhang, "China's Military Structure: What are the Theater Commands and Service Branches?"

military modernization, which was a limited and incremental process. Now it is part of a dedicated national reform process, which is focused on attaining capabilities to rival or overtake great powers by 2050.[1987] For the materialization of the Chinese dream, Xi has announced two main objectives to be achieved according to a strict timeline. First, by 2035, China should "become a global leader in terms of composite national strength and international influence."[1988] Second, by the middle of the twentieth century, China should have "resolv[ed] the Taiwan question and become a state with 'world-class [military] forces.'[1989] Added to internal factors, external factors based on China's threat perception drive its nuclear weapons force modernization.

China's Nuclear Weapons Force Modernization: Implications

Since China went nuclear, its leaders have identified a limited role for China's nuclear weapons, mainly a retaliatory role against the first nuclear strike to deter an adversary. As China's 2015 Defense White Paper notes, Beijing should "deter other countries from using nuclear weapons against China, and from conducting nuclear retaliation."[1990] Such a policy stance is different from the Cold War superpowers, the US and the Soviet Union (Russia) who followed the practice of keeping some nuclear weapons on high alert or launch-on-warning to avoid surprise nuclear attack.[1991] However, with nuclear weapons force modernization in recent years, China is also modernizing related technology, which has far-reaching consequences for international peace and security.

To begin with its early warning system, the 2015 Defense White Paper vowed to "improve strategic early warning" for China's nuclear weapons force, which was reaffirmed in the 2019 Defense White Paper.[1992] Due to the strategic importance of early warning systems,

[1987] Xi Jinping, "Secure a Decisive Victory in Building a Moderately Prosperous Society in All Respects and Strive for the Great Success of Socialism with Chinese Characteristics for a New Era," Speech delivered at the 19th National Congress of the Communist Party of China, October 18, 2017, accessed February 17, 2021, http://www.xinhuanet.com/english/download/Xi_Jinping's_report_at_19th_CPC_National_Congress.pdf
[1988] Ibid
[1989] Ibid
[1990] The State Council Information Office of the People's Republic of China, "The Diversified Employment of China's Armed Forces 2008"
[1991] "Taking Nuclear Missiles off Hair-Trigger Alert," *Union of Concerned Scientists*, Policy Brief, accessed February 24, 2022, https://www.ucsusa.org/sites/default/files/attach/2015/05/Hair-Trigger-Alert-Policy-Brief.pdf
[1992] The State Council Information Office of the People's Republic of China, "China's Military Strategy 2015"; The State Council Information Office of the People's Republic of China, "China's National Defense in the New Era 2019"

people within the PLA began to argue in favor of a launch-on-warning posture. The 2013 SMS also notes that,

> When the conditions are ripe and necessary, and if we can indeed confirm that the enemy has launched nuclear missiles against us, we can quickly launch nuclear missiles in retaliation, before the enemy's warheads reach and detonate over the targets to cause real damage to us.[1993]

The argument behind the 2013 SMS was that since China would launch a nuclear retaliation after absorbing a first nuclear strike, the retaliatory strike would not affect China's NFU pledge.[1994] However, this was an indication of a significant change seven years before the 2013 SMS was written. A launch-on-warning posture would lead to strategic instability, as during a crisis, China's leaders would be under immense pressure to decide, in a limited, time without exactly knowing what kinds of warheads were incoming and the likely impact. The launch-on-warning posture may undermine a decision-maker's ability to calculate threat and respond accordingly, hence initiating a nuclear war. The launch-on-warning posture also challenges the very foundation of the China nuclear weapons program, which is based on the assumption that, *in extremis*, it could absorb a first nuclear strike and still have enough capability to impose unacceptable damage on the adversary.

Also, as China is modernizing and diversifying its nuclear forces, including SSBNs, which are considered as a preeminent source securing second-strike capability, it must be confident of its emerging nuclear triad. This may also increase the intensity of the China-US security dilemma, where a launch-of-warning posture may lead to a chain reaction, making the US vulnerable to a nuclear strike, considering the incoming missile attached with a nuclear warhead, resultantly leaving China more insecure, leading to the vulnerability-invulnerability paradox.

China's nascent SSBNs force also has destabilizing effects on international and regional strategic stability. The US security establishment views China's SSBNs fleet as an emerging threat, compelling the US to take counter-measures. The US, together with allies, has placed advanced anti-submarine warfare aircraft and nuclear-attack submarines in strategic proximity to China.[1995] The new AUKUS security pact would enable regional

[1993] "The 2013 Science of Military Strategy,"
[1994] Author discussion with Chinese analyst
[1995] Tong Zhao, "Modernizing Without Destabilizing: China's Nuclear Posture in a New Era," *Carnegie-Tsinghua Center for Global Policy*, August 25, 2020, accessed February 23, 2021,

states like Australia to add nuclear submarines to the regional security environment, which could lead to a domino effect in the region, as Japan and South Korea have also shown interest in nuclear submarines. New research is also underway into capabilities such as underwater drones, ships, and energy harvesting submarines to track and trail China's nuclear submarines.[1996]

Due to technical and geographical constraints, China may create an SSBN bastion in the South China Sea to maintain continuous-at-sea deterrence patrols. The South China Sea is one of the busiest seas for international shipping traffic, and quite a few states, such as the US, Australia, New Zealand, Japan, South Korea, India, the Philippines, Vietnam, and Malaysia, carry out routine naval exercises in the SCS and US-led freedom of navigation operations (FONOPs) are regular.[1997] With a strong commitment to navigation freedom, US-led FONOP operations are designed to challenge China's efforts to establish a de-facto sphere of naval influence in the Sea. There have been such instances when both the US and China's navies have escaped close encounters.[1998] Such encounters generate insecurity for other regional states such as Japan, which host a network of BMD systems

https://carnegietsinghua.org/2020/08/25/modernizing-without-destabilizing-china-s-nuclear-posture-in-new-era-pub-82454

[1996] Scott Savitz et al., U.S. Navy Employment Options for Unmanned Surface Vehicles (USVS), (DTIC Document, RAND Corporation, 2013); David Blagden, "What Darpa's Naval Drone could mean for the Balance of Power," *War on the Rocks*, July 9, 2015, accessed February 23, 2021, https://warontherocks.com/2015/07/what-darpas-naval-drone-could-mean-for-the-balance-of-power/; David Hambling, "DARPA Building an Energy-Harvesting Submarine that never runs out of Power," *Forbes*, February 12, 2021, February 23, 2021, https://www.forbes.com/sites/davidhambling/2021/02/12/darpas-new-energy-harvesting-manta-ray-is-a-submarine-like-no-other/?sh=91bf14c12e27

[1997] "India and Philippines conduct Naval Drills in South China Sea," August 24, 2021, accessed February 24, 2022, https://www.ndtv.com/india-news/india-and-philippines-conduct-naval-drills-in-south-china-sea-2517042; "India, Vietnam Navies hold exercise in South China Sea," *The Hindu*, August 18, 2021, accessed February 24, 2022, https://www.thehindu.com/news/national/india-vietnam-navies-hold-exercise-in-south-china-sea/article35980776.ece; Rajat Pandit, "India, Singapore conduct Major Naval Exercise near South China Sea," *Times of India*, September 4, 2021, https://timesofindia.indiatimes.com/india/india-singapore-conduct-major-naval-exercise-near-south-china-sea/articleshow/85926272.cms; Diana Stacy Correll, "US, Japan, Australia team up for Naval Exercises in South China Sea," *Navy Times*, October 22, 2020, accessed February 24, 2022, https://www.navytimes.com/news/your-navy/2020/10/21/us-japan-australia-team-up-for-naval-exercises-in-south-china-sea/; Lucy Craymer and Ed Scragg, "NZ frigate sails with UK Carrier Strike Group through South China Sea," *Stuff*, October 6, 2021, accessed February 24, 2022, https://www.stuff.co.nz/national/politics/300424283/nz-frigate-sails-with-uk-carrier-strike-group-through-south-china-sea; Ed Adamczyk, "U.S. Navy, Malaysia's air force hold South China Sea bilateral exercises," *UPI*, April 7, 2021, accessed February 24, 2022, https://www.upi.com/Defense-News/2021/04/07/malaysia-navy-airforce-exercises-southchinasea/3031617822606/

[1998] Minnie Chan, "China-US Close Encounters 'raise Conflict Risk in South China Sea'," *SCMP*, June 16, 2020, accessed February 23, 2021, https://www.scmp.com/news/china/military/article/3089312/china-us-close-encounters-raise-conflict-risk-south-china-sea; Timothy Liu, "What was the U.S. P-8 Spy Plane doing off China's Hainan Island?" *China New*, August 29, 2014, accessed February 23, 2021, http://chinadailymail.com/2014/08/29/what-was-the-us-p-8-spy-plane-doing-off-chinas-hainan-island/.

on its warships. Despite expanding and modernizing the land-based nuclear missile force and introducing MIRV-ing capabilities, China is on a fast track to expanding its SSBN fleet, reflecting the strategic intent of maintaining its naval primacy in the South China Sea and, potentially, extending it.

Also, with the introduction of SSBNs, China has to increase the alert level during peacetime like other states who keep their SLBMs in a ready-to-launch position. SSBNs conducting a patrol with warheads in a mated position reduce the time required to arm SSBNs in a crisis. The deterrent effects of such patrols would be viewed as a negative development by Washington, deepening and intensifying the existing US-China security dilemma. Such moves could push the US to increase its antisubmarine warfare activities and submarine presence to maintain strategic balance in the region, which may increase the likelihood of advertent or inadvertent causes of crisis.

By expanding its SSBNs, China is seeking to ensure it has a secure second-strike capability, and easier access to targets. China's SSBNs have necessitated a significant increase in the number of missiles with nuclear warheads capable of reaching the US, and it continues in this direction.[1999] The next-generation Type-96 SSBN, the JL-3 SLBM, and the associated increase in the number of nuclear warheads for new SLBMs could negatively affect deterrence instability, as discussed above. The significant growth in the PLAN's nuclear capabilities and outreach has increased the regional and international concerns over China's nuclear expansion program.

It is important to note that the US nuclear force modernization plan, which started during the Obama administration, was primarily related to replacing the US' aging inventory. However, after China's ambitious strategic nuclear force modernization and expansion program was announced in 2015, the US 2018 NPR introduced new policies and capabilities deemed critical to rebalancing the emerging strategic instability and insecurity in Asia in Washington's favor. For instance, the NPR posits that the US would consider the use of nuclear weapons in case of "significant non-nuclear strategic attacks," including attacks on "civilian population or infrastructure."[2000] It also calls for a new nuclear Sea Launch Cruise Missile (SLCM) and a low-yield SLBM warhead, which "will help counter any mistaken perception of an exploitable 'gap' in U.S. regional deterrence

[1999] Norris and Kristensen, "Chinese Nuclear Forces, 2008"; also see other yearly recent reports. Norris and Kristensen, "Chinese Nuclear Forces, 2020."
[2000] "2018 Nuclear Posture Review"

capabilities."[2001] The NPR also revealed that the US is "incorporating nuclear capability onto the forward-deployable, nuclear-capable F-35A."[2002] Amidst these new plans, the NPR also appears to retain the 1.2 megatons B-83 nuclear bomb, which was supposed to retire after B61-12 entered into service, noting that it will be retained "until the suitable replacement is identified."[2003]

Additionally, the US Navy plans to operate as many as 48 Aegis warships in 2021 and increase the number to 65 by 2025 as China's hypersonic missiles could undermine the US and Japan's existing BMD capabilities in the region.[2004] Japan's SDF also possesses seven Aegis destroyers, and another will deploy in 2021.[2005] The technical efficacy of these capabilities suggests they are designed to be used against China's short and medium-range ballistic missiles, SSBN force, and its A2/AD – a strategy of keeping adversaries at a distance by denying them access to the base area of operations, which in the case would be China's Naval ports and missile bases close to the South China Sea. This spiral of security-insecurity leads to strategic instability and arms race dynamics, evident from these action-reaction developments.

What further exacerbates and complicates the situation is China's comingling of its conventional and nuclear missile forces. The People's Liberation Army Rocket Force (PLARF) controls both conventional and nuclear missiles.[2006] Therefore, a strike on China's conventional missile forces or its command and control centers to eliminate or disrupt its conventional forces may inadvertently lead to disruption and elimination of its nuclear command and control systems and nuclear forces. Such a strike would pressure China's strategic decision-makers to use nuclear weapons before losing them to adversarial strikes. Similarly, a missile launched advertently or inadvertently from a unit operating both conventional and nuclear-capable missiles would be hard for the BMD system of the US or Japan to read, whether the incoming missile is carrying a nuclear payload or needs interception, or a nuclear or conventional response before it struck the US, further pressurizing the decision-makers in Washington. Such crisis instability may

[2001] Ibid
[2002] Ibid
[2003] Ibid
[2004] "Navy Aegis Ballistic Missile Defense (BMD) Program: Background and Issues for Congress," *CSR*, December 23, 2020, accessed February 23, 2021, https://fas.org/sgp/crs/weapons/RL33745.pdf
[2005] Zhao, "Modernizing without destabilizing"
[2006] "China Power, How are China's Land-based Conventional Missile Forces Evolving?" *China Power*, September 21, 2020, updated December 15, 2020, accessed February 23, 2021, https://chinapower.csis.org/conventional-missiles/

escalate to strategic instability and full-fledged war between both states. The situation would be more complex for Japan, which operates far fewer BMD batteries than the US.

China also possesses the DF-17, a nuclear-capable hypersonic glide vehicle (HGV).[2007] The HGVs' high maneuverability and lower-altitude trajectory make them more capable of penetrating BMD systems. Moreover, China has recently tested HGV from a space rocket, the Long-March, which gives it the capability to bypass the US BMD system.[2008] The US maintains a launch-on-warning posture, and its nuclear weapons are ready to launch once its early warning system detects an incoming nuclear strike. The ballistic missile flight trajectories are different from HGV trajectories, and it is unlikely that the US BMD system would detect incoming HGV or the nature of its attached payload. There is a possibility that a conventional attack may generate a nuclear response from the US. For this reason, the US, once planning for converting nuclear SLBMs to conventional, relinquished that plan.

China's DF-17 could be effective against Japan's Aegis and Patriot systems and South Korea's THAAD batteries, which are designed for ballistic missile interception. With DF-17 in its inventory, China enjoys leverage over crisis escalation as it turns the balance of power in favor of China against Taiwan. According to PLA officers, HGV's anti-ship variants are under development, a serious threat to US aircraft carriers, surface battleships, and other deployments.[2009] Japan's decision to reject acquiring two Aegis Ashore BMD sites for what Japan calls "enemy base strike" capability is a reflection that Japan is not satisfied with the existing setup and is, instead, moving towards "offensive defense" or "active defense" to counter China's emerging offensive capabilities.[2010] This spiral of security-insecurity leads to arms race dynamics in the region, as in Japan's security-related discourse, neutralizing the adversary's military capabilities to defend Japan is considered a defensive strategy.[2011]

[2007] Missile Defense Project, "DF-17," *Missile Threat*, Center for Strategic and International Studies, February 19, 2020, last modified June 23, 2020, accessed February 23, 2021, https://missilethreat.csis.org/missile/df-17/

[2008] Demetri Sevastopulo and Kathrin Hille, "China tests New Space Capability with Hypersonic Missile, *FT*, October 17, 2021, accessed February 24, 202, https://www.ft.com/content/ba0a3cde-719b-4040-93cb-a486e1f843fb

[2009] Military and Aerospace Electronics, "The emerging China hypersonic weapons threat to surface vessels at sea," April 24, 2019, https://www.militaryaerospace.com/unmanned/article/16711522/the-emerging-china-hypersonic-weapons-threat-to-surface-vessels-at-sea.

[2010] Titli Basu, "Will Japan pursue a Strike Capability in lieu of Aegis Ashore?" *The Diplomat*, July 28, 2020, accessed February 23, 2021, https://thediplomat.com/2020/07/will-japan-pursue-a-strike-capability-in-lieu-of-aegis-ashore/

[2011] Ibid

Lastly, when it comes to the role of nuclear weapons, China now envisages an altogether different role for nuclear weapons than that in 1964 when it conducted nuclear tests and chose to maintain a very small nuclear retaliatory capability. China's once clear conditions that it would not use nuclear weapons are now blurry, rather than straightforward. For instance, one competent authority on China's nuclear weapons program opined that the launch-of-warning posture is very much consistent with NFU.[2012]

Additions to the Existing Literature

The existing literature on China's nuclear force modernization draws predominantly upon structural realism, focusing on structural factors as the key drivers of change, hence overlooking significant internal factors. This study has added to this by employing the neoclassical realist framework of analysis, carrying out a comparative analysis of internal and external factors influencing the ongoing changes in China's nuclear weapons policy and force modernization.

The thesis has also carried out a capability-based analysis of China's nuclear weapons use policy. The recent changes in its nuclear weapons doctrine are also related to Beijing's emerging and new nuclear weapons force capabilities, which is the outcome of the modernization process. For instance, the deployment of MIRV-capable DF-41, the missile silo fields, the nuclear role assigned to PLAAF and/or operationalization of SSBNs effect aspects of existing nuclear weapons doctrine, has necessitated a change to bring them into greater alignment to maximize China's nuclear deterrence operations and objectives.

The thesis also examined China's emerging nuclear weapons policy and force modernization from the nuclear and alliance security dilemma perspective, examining the counter-reactions from states examined in the case studies (Japan, South Korea, India and Taiwan), which makes this scholarship unique in the existing literature. The research also critically evaluated the US and China's nuclear weapons policy in reference to the theory of victory, sometimes called nuclear warfighting.

Since China's nuclear weapons force modernization is an emerging process, the international and regional security competition and outcomes in the shape of action-reaction responses are ongoing. Therefore, there will always be a need for new and updated research and analysis on the subject matter. The thesis, in short, explains that the

[2012] Author discussion with Chinese analyst

emerging nuclear weapons force modernization of China, which shows signs of revisionism in some areas, is leading towards greater strategic insecurity, manifested in a security dilemma between China and its rivals.[2013]

Future scholarship should delve deeper into this finding by examining the implications of China's emerging military assertiveness on the future nuclear arms race and control, and implications for nuclear non-proliferation. Examing this would require answers to questions about what future role China envisages for its nuclear forces? Will China bring its nuclear capabilities up to the same level as the US or pursue strategic superiority? What does China envisage its nuclear forces should look like by 2050, a deadline President Xi announced to make China capable of fighting and winning great power wars?

China's ongoing nuclear force modernization has negatively affected strategic stability, particularly its SSBN and ICBM force modernization and capability enhancements. Focused research should also be carried out on how China will operationalize the de-centralization of nuclear use authority when its SSBNs conduct CASD outside its bastion seas, with consideration of the implications this will have on US-China strategic relations, on the strategic balance and their respective threat perceptions, and on strategic and crisis stability.

Additionally, China's nuclear modernization and its short and medium-range dual-capable and hot-swappable (a feature that enables a quick replacement of payload attached to the ready-to-launch missile) missiles such as DF-21 and DF-26 have regional implications, particularly for Japan. A future study should consider South Korea and Japan's options and possible responses, particularly related to the US stationing of nuclear weapons on their territory for credible extended deterrence. At a broader level, regional political and military responses can be examined by analyzing the future of the AUKUS, which is now extending cooperation to develop hypersonic missiles, and the QUAD.[2014] Recently the US hosted the first virtual leadership-level meeting of the QUAD after President Joe Biden's inauguration in February 2021.[2015] This, and QUAD-related initiatives and statements during the Trump administration, suggest the QUAD will

[2013] Robert Jervis, "Cooperation Under the Security Dilemma," *World Politics*, Vol. 30, No. 2, (January, 1978), 167-214

[2014] Christy Cooney, "Hypersonic missiles: UK, US, and Australia to boost defense co-operation," *BBC*, April 5, 2022, accessed April 14, 2022, https://www.bbc.com/news/uk-61000416

[2015] John Power, "What is the QUAD, and how will it impact US-China Relations under the Biden administration?" *SCMP*, February 24, 2021, accessed March 17, 2021, https://www.scmp.com/week-asia/explained/article/3122933/what-quad-and-how-will-it-impact-us-china-relations-under-biden

continue to deepen its institutionalization and military relation cooperation among its members. A full-blown QUAD military alliance cannot be ruled out in the future but, even short of that, China will feel compelled to react in ways to ensure it balances the QUAD.

Similarly, arms races and arms control, particularly a nuclear arms race, could be another important area for future research. Thought, and practical effort, is required as to whether China be included in the START arms control regime alongside the US and Russia, or are entirely new arms control agreements necessary to bring China into arms control, and to regulate new technological developments that have major implications for strategic stability (like hypersonics, cyber, missile defenses and AI)? How can space, an increasingly strategically vital and contested domain, be threaded into US-China strategic relations to reduce miscalculation and uncertainty?

China's nuclear force modernization is inducing a regional and international response, which could have serious implications for major nuclear arms control regimes and organizations, such as the Nuclear Non-Proliferation Treaty (NPT), Missile Technology Control Regime (MTCR), Fissile Material Cut-off Treaty (FMCT), Nuclear Suppliers Group (NSG), and The Wassenaar Arrangement (WA) on Export Controls for Conventional Arms and Dual-Use Goods. The force modernization could drive regional states to go nuclear or become part of an existing nuclear or nuclear-related material regime, much like how India gained a waiver for the NSG or the AUKUS deal that will see sensitive nuclear technologies given to Australia and, in turn, will improve Australia's ability to acquire a nuclear weapon in the future should it be deemed necessary. Such outcomes could have global ramifications, which need due consideration.

China is also competing internationally in emerging disruptive technologies, such as robotics, unmanned drones and swarms, artificial intelligence (AI), cyber warfare, and quantum computing. These disruptive technologies could have a further multiplier effect on the nuclear weapons force modernization of China, which could be a future area of inquiry. The particular interest, in this regard, should be China's emerging cyber warfare and AI capabilities and how these capabilities can disrupt nuclear command control and communications and lead to the accidental or inadvertent nuclear crisis.

Final Reflections

This thesis has utilized neoclassical realism to define its theoretical parameters. In doing so, it has drawn attention to the interplay between external threats and internal factors; these, in turn and in combination, have driven, and continue, to drive China's ongoing nuclear force modernization. China's strategy in the nuclear sphere has been driven by fear of the external environment it faces, that appear inhospitable to its ambitions and interests. In turn, other states view China's nuclear modernization, when coupled to its assertive foreign policy in recent years, to be motivated by offensive designs. This is the tragedy of great power politics and the security dilemma, China's rivals do not feel they have the luxury to assume Beijing is motivated by defensive intentions; they would rather assume the worst (China's ambitions are large and can only be checked by a counter-response, even if this leads to a spiral of reactions and intensified enmity) and be wrong than assume the best (China's intentions are defensive and limited) and be wrong. The stakes are simply too high.

Yet, the analysis here of China's ongoing nuclear force modernization suggests that the two variables upon which the scale and nature of the security dilemma rests: the offense-defense balance and offense-defense differentiation (whether weapons and policies that protect the state also provide the capability for attack) of China has a defensive orientation at this point in time.[2016] However, considered by others to be offensive, the modernization is generating responses from the US and regional states that they, in turn, view as defensive. So far, on both sides, there exists a delicate yet slow-shifting equilibrium in the offense-defense balance and offense-defense differentiation balance. What the future holds is not known. It is possible that a single major development in the nuclear sphere (say, if Japan, South Korea, or Taiwan went nuclear or if China officially gives up its NFU first-use policy) will shatter this delicate balance.

To many, the fundamental objective in achieving an operational nuclear triad with a robust early warning and space-based system, and restructuring of the nuclear and strategic support force, is a clear indication of what was highlighted in the 2013 SMS that China is on the trajectory of achieving a full-spectrum deterrent capability. According to

[2016] Jervis, "Cooperation Under the Security Dilemma," 167-214; Robert Jervis, "Was the Cold War a Security Dilemma?" *Journal of Cold War Studies* Vol. 3, No.1, (Winter, 2001), 55-56; Robert Jervis, *The Meaning of the Nuclear Revolution: Statecraft and the Prospect of Armageddon* (Cornell University Press, London, 1989), 64-66, 116

PLA Lieutenant General He Lie, the underlying objectives of China's military modernization is to "effectively enhance our ability to *fight and win wars*, resolutely safeguard China's sovereignty, security, and development interests, and effectively fulfil the sacred missions and tasks the people's army has been entrusted in the new era."[2017] President Xi, advocating his vision for what he calls the *China Dream*, has committed to producing a "world-class force" that can "fight and win" global wars by 2049.[2018]

In light of President Xi's statement above, the Trump administration's 2018 NPR correctly notes that "for the first time in 25 years, the United States is facing a return to great power competition."[2019] This is signaled not just by the rise of China to near-superpower status but its intentions to fight and win wars, and presumably the chief opponent in these prospective wars will be the US. If China was rising but not modernizing its military and nuclear weapons program, it is highly unlikely the US would so openly be declaring that great power competition had returned. The 2018 US NPR must be understood in this context: once its objectives are achieved, the new nuclear force capabilities it outlines could give the US greater warfighting capabilities.

China's ongoing nuclear weapons force modernization is creating multiple potential conflict dyads, and, at worst, raising the prospects of a multifront conflict between China and the many nations surrounding it: it has generated international and regional responses that feed into a new arms race at the conventional and strategic levels despite the complex economic interdependences that exist and that many long hoped would suppress tensions and intense military competition.

The important question that arises here: why is China involved in a cycle or process that is breeding a chain-reaction, making China more insecure, and generating a greater level of strategic instability and insecurity at both the regional and global level? To put it differently, China's force modernization in the interpretation of Chinese analysts is a reaction to actions taking place externally, which are compromising China's security and

[2017] Lt. Gen. He Lie, "China should Effectively Enhance Ability to fight, win Wars, *Global Times*, October 1, 2020, accessed February 23, 2021, https://www.globaltimes.cn/content/1202566.shtml
[2018] Xi Jinping, "Secure a Decisive Victory in Building a Moderately Prosperous Society in All Respects and Strive for the Great Success of Socialism with Chinese Characteristics for a New Era," Delivered at the *19th National Congress of the Communist Party of China, October 18, 2017*, accessed February 24, 2021, http://www.xinhuanet.com/english/download/Xi_Jinping's_report_at_19th_CPC_National_Congress.pdf; Lindsay Maizland, "China's Modernizing Military," *CFR*, updated February 5, 2020, accessed February 24, 2021, https://www.cfr.org/backgrounder/chinas-modernizing-military
[2019] "2018 Nuclear Posture Review,"

national objectives. Additional insight also lies in the statement of Charles Glaser that "the United States' forward military presence does enhance its power-projection capabilities, which [from Beijing's view] threaten China's ability to protect its sea-lanes and coerce Taiwan."[2020] In other words, like China's competitors around it that are engaged in tit-for-tat reactions based upon worst-case analysis, so too is China compelled to engage in a similar evaluation of the situation and, thus, compelled to pursue a similar pattern of behavior.

Internal factors are also playing a critical part in shaping China's strategic outlook. For instance, President Xi's *China Dream* casts China's military rise as part of the great rejuvenation of the Chinese nation, while the PLA view this dream as one that portends "a powerful military" and to achieve this goal, "we must steadfastly champion a unified goal of a rich country and powerful military [that] must be able to fight and be able to win."[2021] Leadership ambitions, supported by a strong economy, are responses from within to external drivers of insecurity. The Chinese leadership role is no different from their counterparts in the US or elsewhere, driven by the security-insecurity paradox in an anarchic international system.

Some aspects of the international distribution of power are shifting in favor of China, as its economy is expected to surpass the US economy in 2026, two years earlier than predicted owing to the Covid-19 pandemic.[2022] The growing distribution of global power and wealth will significantly impact China's future behavior in the international system. As adherents of neoclassical realism argue, "the scope and ambition of a country's foreign policy are driven first and foremost by its place in the international system and specifically by its relative material power capabilities." [2023] The structure of the international system, which remained unipolar for a short period after the collapse of the Soviet Union, has now transformed into an unbalanced multipolar one. According to Mearsheimer, structural imperatives force states to behave in particular ways, which is why the US sought to dominate the Western Hemisphere to guarantee its survival and

[2020] Charles Glaser, "Will China's Rise Lead to War? Why Realism does not mean Pessimism," *Foreign Affairs*, Vol. 90, No. 2, (2011), 86

[2021] "Rich Country, Powerful Military' and Continuous Efforts to Strengthen National Defense," *People's Daily*, December 13, 2012, quoted in Zhang Baohui, "Xi Jinping, 'Pragmatic' Offensive Realism and China's Rise," *Global Asia* Vol. 9, No. 2, 74

[2022] Evelyn Cheng and Yen Nee Lee, "New chart shows China could overtake the U.S. as the World's Largest Economy earlier than expected," January 31, 2021, accessed March 19, 2021, https://www.cnbc.com/2021/02/01/new-chart-shows-china-gdp-could-overtake-us-sooner-as-covid-took-its-toll.html

[2023] Gideon Rose, "Neoclassical Realism and Theories of Foreign Policy," 146

security.[2024] He claims that China is doing the same for its survival, thus seeking to push the US out of Asia. President Xi, along similar lines, stated in 2014 that,

> It is for the people of Asia to run the affairs of Asia, solve the problems of Asia and uphold the security of Asia. The people of Asia have the capability and wisdom to achieve peace and stability in the region through enhanced cooperation.[2025]

The problem is that the US has vested interests in the region, a key one of which is to make sure China does not become the regional hegemon. Therefore, the intense security competition is real and largely inevitable.[2026] China's proposal for the *New Model of Great Power Relations* during the Obama administration was a broad one, related to how the global order in the coming decades should be shaped and it asserted that a new model be established in which China has a greater leadership role commensurate to its rising share in the global distribution of power.[2027] The US did not take China up on this offer preferring, instead, to push back against China's growing power.

The ongoing nuclear weapons force modernization and responses from the US and its allies are similar to what Graham Allison called the *Thucydides Trap*, an outcome when a revisionist power challenges an established status-quo power.[2028] A team led by Allison examined 16 cases in the last 500 years and found that 14 cases ended up in war. Allison writes that, based on the current trajectory, "war between the United States and China in the decades ahead is not just possible, but much more likely than recognized at the moment."[2029] While appraising America's position in the structure, Kennedy notes that its share of global power is declining, and the endurance of US power relies on overcoming two primary challenges: firstly, how to preserve the economic foundations

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[2024] Interview: John Mearsheimer, "China-U.S. Competition: Inevitable or Manageable?" *CGTN*, November 3, 2019, accessed March 19, 2021, https://www.youtube.com/watch?v=M37Wxt5yLUI

[2025] "Xi Jinping, New Asian security concept for new progress in security cooperation." Remarks at the Fourth Summit of the Conference on Interaction and Confidence Building Measures in Asia, Shanghai. May 21, 2014, accessed February 24, 2022, Ministry of Foreign Affairs of the People's Republic of China. Retrieved from http://www.fmprc.gov.cn/mfa_eng/zxxx_662805/t1159951.shtml.

[2026] Interview: John Mearsheimer, "China-U.S. Competition: Inevitable or Manageable?"

[2027] Stephen J. Hadley, "America, China and the 'New Model of Great-Power Relations'" *Lowy Institute*, 2014, accessed October 13, 2020, https://www.lowyinstitute.org/publications/america-china-and-new-model-great-power-relations; Cheng Li and Lucy Xu, "Chinese Enthusiasm and American Cynicism over the "New Type of Great Power Relations," *Brooking*, December 4, 2014, accessed December 13, 2020, https://www.brookings.edu/opinions/chinese-enthusiasm-and-american-cynicism-over-the-new-type-of-great-power-relations/

[2028] Graham Allison, *Destined for War: Can America and China Escape Thucydides' Trap?* (Cambridge, MA.: Houghton Mifflin Harcourt, 2017)

[2029] Graham Allison, "The Thucydides Trap: Are the U.S. and China Headed for War?" September 12, 2015, accessed March 19, 2021, https://www.theatlantic.com/international/archive/2015/09/united-states-china-war-thucydides-trap/406756/

of its power, and secondly to preserve equilibrium in the balance of defense commitments versus the means required to sustain those commitments.[2030] Kennedy notes that it is beyond the US's power to defend its globe-spanning obligations and interests in perpetuity, and the world witnessed how the US militarily overstretched itself after 9/11 in its military conflict in Afghanistan and Iraq.[2031] The US cannot have it all and needs to reconcile itself to a modified distribution of its military forces across the world.

The US and China are the most powerful states globally, with massive economies, political power and influence, and military capacity that could end human civilization should it be used. The US has been a leading power now for many decades. It defeated great adversarial powers in world wars and overcame another during the Cold War. Through all these struggles, it attained the position of the sole superpower in a unipolar world. However, for China, its post-1970s rise is a recent, sudden and ongoing phenomenon, although it is returning China to the historical norm in which it was one of the greatest powers in the world. What started after Deng's opening up and reforms has led China to a level of unprecedented economic growth and, therefore, military modernization, which is still underway. China is now the second-largest economy, ready to take over the US in the coming years. The distribution of global power among states is constantly changing, which leads to the constant rise and fall of great powers. Though the future is uncertain, the US and China are uniquely positioned in the international system, where an intense competition between them is now occurring. This is particularly the case in the Indo-Pacific region, where the decades-old US-led security architecture is increasingly challenged by China's rise. Any confrontation leading to a military conflict would have severe consequences for international and regional security, and strategic stability. A limited conflict could escalate into a total war involving absolute weapons. This would be devastating for the entire world. The US, which has fought and won many wars and rivalries and remained unrivaled for decades, may aggressively defend the status quo to hold on to what it has achieved. It would be in the interest of China to gradually ascend in power without challenging the existing order, given this very order enabled it to rise. It should also avoid provocative policies, and a force modernization that is viewed as revealing of hostile intent, without this, as the present cycle suggests, it will lead to regional and international strategic instability and an arms race exacerbating the nuclear

[2030] Paul Kennedy, *The Rise and Fall of the Great Powers: Economic Change and Military Conflict from 1500 to 2000* (New York: Vintage Books, 1989), 438-514
[2031] Ibid

security dilemma. China's political and military leadership must understand that China can consider itself secure only when its adversaries are secure; in turn, its adversaries must recognize that China has a legitimate claim to a greater say in world affairs. How this is managed and whether accommodation and conciliation can be reached between Washington and Beijing will dictate whether the twenty first century is one of peace and relative stability or competition and tension.

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