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The Strategic Chain

*Linking Pakistan, India,
China, and the United
States*

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THE STRATEGIC CHAIN

Linking Pakistan, India, China, and the United States

Robert Einhorn, Project Co-Chair
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About the Project

The 15-month Brookings Institution project focused on the “strategic chain” linking Pakistan, India, China, and the United States—a series of relationships that are resulting in some of the most active nuclear weapons, missile, and missile defense programs anywhere in the world today. The project’s main goal was to identify policies and measures that could promote stability and reduce incentives for arms build-ups between key pairs of protagonists, regionally, and globally, while also contributing to a better understanding of the various strategic interconnections among these four nuclear-armed powers.

The study was based on research conducted by Brookings and foreign experts and drew on the results of consultations with former senior officials and scholars from each of the four countries in the strategic chain. The contributions of participants in these consultations reflected their personal views and not necessarily the positions of their governments. This report provides analysis of the “strategic chain,” and recommendations for promoting stability and moderating competition, whether between pairs of “strategic chain” countries, on a region-wide basis, and even globally.

Rationale and Goals of the Project

Considerable policy analysis has been devoted to bilateral strategic relationships between Pakistan and India, India and China, and China and the United

States. But the strategic dynamics among these four nuclear powers cannot be understood or effectively addressed on a strictly bilateral basis. While Pakistan responds strategically to India, India responds both to Pakistan and China, which in turn responds both to India and the United States.

There are many reasons for the lack of success in promoting strategic restraint among these four nuclear-armed states, whether on a unilateral, bilateral, or plurilateral basis. Among the reasons are long-standing conflicts, varying conceptions of the national interest and its requirements, widespread mistrust among the key powers, domestic pressures, and resentment toward foreign interference (primarily directed at the United States). But one factor that has not been adequately examined is the strategic chain linking Pakistan to India, India to China, and China to the United States. Without Indian restraint, Pakistan is unlikely to constrain its programs unilaterally. Without Chinese restraint, India will be very reluctant to limit its programs unilaterally or engage in bilateral controls with Pakistan that, according to India, would limit its options vis-à-vis China. And without U.S. constraints on capabilities of concern to China, Beijing may continue to resist curbing its strategic modernization efforts.

Moreover, India and the United States have expressed concern about longstanding China-Pakistan cooperation in important areas, and Pakistan has expressed concern about Indian-U.S. cooperation in important areas, especially in the wake of the U.S.-India civil nuclear deal.

The project's focus on these four countries is not meant to suggest that their strategic links to other nuclear powers are not consequential. Russia, in particular, might well have been included as an additional link in the chain. However, for reasons of manageability, as well as the desire to avoid complicating the project by bringing into it the difficult issues surrounding the current U.S.-Russia relationship, the decision was made to confine the effort to the four.

The project aimed to identify policies and measures that could promote stability and reduce incentives for arms build-ups between key protagonists, among these four nuclear powers more generally, and even globally, while also contributing to a better understanding of the various strategic interconnections among these four nuclear-armed powers.

A critical research objective of the project was to examine how and the extent to which this chain serves as an obstacle to strategic restraint—and then to consider whether and how a better understanding of these strategic linkages can be used to devise more effective approaches to reducing incentives for nuclear and missile build-ups in southern Asia.

Among the questions that the project sought to address were:

- What are the strategic perspectives and doctrines of the four powers? Are they evolving and, if so, how? Do doctrinal asymmetries among the four contribute to instabilities and arms competitions?
- What developments in the strategic programs of the four states (e.g., nuclear weapons, nuclear-armed ballistic and cruise missiles, tactical nuclear systems, missile defenses, conventionally-armed long-range missiles) are likely to have stabilizing or destabilizing effects among these four nuclear powers?
- To what extent are prospects for bilateral measures of restraint (e.g., Indo-Pakistan, Sino-India) actually inhibited by strategic linkages to third countries—rather than inhibited by other

factors having little to do with linkages to third countries?

- Given linkages of bilateral strategic relationships to third countries, must those third countries be involved in some fashion in any bilateral restraint arrangements? If so, how? Should those third countries adopt the same constraints as the other two parties or can they better participate by adopting supportive collateral or confidence-building measures?
- Are there areas where the strategic interests of Pakistan, India, China, and the United States coincide, and where the four countries might be prepared to adopt identical or similar measures (e.g., nuclear security, anti-smuggling, export controls, missile defense)?

Review of the Project Proceedings

Three meetings were held in Beijing, Doha, and Washington, D.C. to discuss the abovementioned issues. At the first meeting held March 7-9, 2016 in Beijing, the national strategic perspectives of China, India, Pakistan, and the United States, which were drafted by scholars from each of the four countries, were discussed. A Brookings background paper on the nuclear and other strategic forces of the four countries was also discussed in Beijing. For the second meeting held in Doha May 20-21, 2016, papers from China, India, Pakistan, and the United States with new ideas and proposals to further enhance stability among the strategic chain countries were circulated for consideration by the group. In addition, Brookings prepared a background paper on the existing unilateral, bilateral, plurilateral, and global measures undertaken by the four countries to enhance stability. The third and final meeting held October 26-28, 2016 in Washington, D.C. had a focused discussion on a draft outline for the final report of the project, including possible additional measures to enhance stability, and an assessment of the utility and benefits of the strategic chain concept for the participating experts. The papers presented at the Beijing and Doha meetings are annexed to this report.

Summary of National Strategic Perspectives

Asia is becoming the locus of great power political interaction, and the strategic interrelationships between the nuclear powers in this region, in particular, China, India, Pakistan, and the United States, are proving to be much more complicated than the relatively simple, bipolar nuclear order of the Cold War. In order for these nations to ensure their security, and to maintain strategic stability, it is important to better understand this “strategic chain” of relations between these four nuclear powers. To do so effectively, however, it is crucial to understand the strategic environment and doctrines of each country.

This section addresses the security environment, threat perceptions, and defense doctrine of each country, and the strategy for achieving its security objectives, with a special emphasis on the role that nuclear weapons and other strategic capabilities play in promoting its interests.

A scholar from each country was commissioned to write a paper on his own country’s strategic environment and doctrine. This section summarizes the authors’ papers without additional commentary or analysis and using the authors’ own words to the greatest extent possible. The full set of original papers is annexed to this report.

*China*¹

Strategic Environment

China is facing a challenging strategic security environment. It believes the United States has adopted a containment strategy to check the growth of China’s power and influence. China also believes the United States is not acting alone, but is enhancing its alliance system in the Asia-Pacific region and encouraging neutral countries to side with the United States against China.

China has long seen relations with the United States as its most important bilateral relationship. Since the 1990s, this relationship has focused on mutual economic interest, but major differences have led to different understandings on a wide range of political and security issues. Seeing a power transition, enhancing Beijing’s power relative to that of Washington, as likely in the mid- to long-term future, China worries that the United States will resist this transition. Such concern has led Beijing to suspect that Washington is implementing a systematic strategy to contain China.

China privately acknowledges that the U.S. alliance system in Asia has successfully prevented its allies from developing nuclear weapons, but China still views the U.S. alliance system as representing a grave threat to China’s security. From Beijing’s point of view, the “rebalance” to Asia is the most recent effort by Washington to reinforce the alliance against a rising China.

Beijing sees Washington’s hand behind almost every regional confrontation, including over the disputed Diaoyu/Senkaku islands, the South China Sea, and the independence movement in Taiwan. Beijing believes that U.S. meddling has exacerbated recent tensions in the region. The Sino-Japanese relationship also continues to worsen, and China is deeply worried that Tokyo is moving to revise the pacifist constitution in place since the end of World War II and will work with Washington to check China’s influence in the region.

Against this backdrop, China sees itself as fighting an uphill battle to maintain strategic stability with the United States—its primary rival—and to deal with other new nuclear challenges. Various statements from U.S. officials and nongovernmental efforts have led Beijing to fear that the United States seeks a first-strike capability against China. In addition, the emergence of various non-nuclear military technologies poses an unprecedented threat to China’s

¹ This section summarizes a paper on China’s strategic environment and doctrine authored by Zhao Tong of the Carnegie-Tsinghua Center for International Policy, Beijing.

confidence in the survivability and credibility of its nuclear deterrent. Among these non-nuclear technologies, missile defense and conventional prompt global strike capacity are of foremost concern to China, and the possibility of disarming cyberattacks are not far behind.

In addition, many Chinese strategists and experts are concerned that Japan and South Korea (Republic of Korea, or ROK) are pursuing technical hedging strategies that will allow them to build nuclear weapons in the future. China also suspects that South Korea has decided to side more firmly with the United States by choosing to deploy the Terminal High Altitude Area Defense (or THAAD) missile defense system.

On the Korean Peninsula, China worries about North Korea's nuclear capacity, as well as the instability that military actions by the United States and ROK may cause on the Peninsula, due to the fact that nuclear threat, refugee flow, and political chaos all endanger China's near- and long-term interests. However, China has always believed that upholding nuclear non-proliferation principles is in the ultimate interest of China and the international community.

In South Asia, China has traditionally not paid much attention to the nuclear competition between India and Pakistan, but this may change as the nuclear gap between China and India has narrowed through India's rapid development of long-range ballistic missiles, the development of multiple independently targetable re-entry vehicles (or MIRVs) on ballistic missiles, submarine-based nuclear weapons, missile defense systems, and outer space capabilities. China also fears that the widening nuclear and conventional military gaps between India and Pakistan may threaten regional stability.

Strategic Doctrine

China does not publish an official nuclear strategy, but scholars believe China adheres to a strategy of minimum nuclear deterrence. China has for decades maintained a relatively small nuclear arsenal. Beijing

also has a No First Use (NFU) doctrine, stating that China will not be the first state to use nuclear weapons in a conflict and would only use nuclear weapons in retaliation to an enemy nuclear strike.

China is taking steps to gradually expand and modernize its nuclear forces. Some Chinese experts believe that China's nuclear deterrent has in the past been based on "uncertain retaliation"—a capability that is not sufficient to guarantee retaliation, but enough to plant doubt in an enemy's mind that it can completely destroy China's arsenal in a first strike. As China's economy grows and it has greater resources to spend on military modernization, however, China is moving toward achieving an assured nuclear retaliation capability. Moreover, concerns about U.S. missile defense and conventional prompt strike weapons have also been driving Beijing's investment in nuclear modernization programs. Additionally, China has been following in the steps of the other major nuclear powers in developing new nuclear technologies, sometimes for the sake of simply mastering these technologies rather than actually deploying them. After going through the so-called "hundred years of foreign invasion and national humiliation," Chinese leaders have developed a belief that China cannot afford to lag behind other major powers on important defense technologies.

For all these reasons, China has achieved major breakthroughs in nuclear capabilities in recent decades. China has deployed advanced road-mobile intercontinental ballistic missiles (ICBMs) and is reportedly developing another more powerful road-mobile ICBM with a longer range. China has recently deployed MIRVed silo-based intercontinental ballistic missiles, which could improve China's capability to penetrate U.S. missile defense systems. In addition to land-based nuclear weapon systems, China has built a relatively modern strategic submarine ballistic nuclear (SSBN) fleet, which is armed with submarine-launched ballistic missiles. China's 094 class SSBN has reportedly conducted its first patrol this year, and China's engineers are constantly working to improve their quietness and survivability.

With a changing geostrategic environment and improving nuclear capabilities, there is internal debate in China about future nuclear posture. As China becomes increasingly concerned about the threat of U.S. conventional strikes against Chinese nuclear forces, some scholars argue that China should add conditions to its NFU policy, or adopt a launch on warning or launch under attack posture. The Chinese government has rejected any such changes, but it shows that China's nuclear thinking is increasingly influenced by Western doctrines and forces, and that China's nuclear posture could deviate from its traditional practice in the future.

With regard to North Korea, China is willing to apply the strictest export control and economic sanctions that directly target Pyongyang's nuclear and missile programs. China fundamentally disagrees with the United States and others, however, that North Korea is solely to blame for the impasse in diplomatic talks, or that tougher sanctions will bring North Korea to change its position. Beijing, therefore, sees Western demands for China to impose sweeping sanctions against North Korea as unfair and risky for China. Ultimately, how China chooses to deal with North Korea will depend on the U.S.-China relationship. If Beijing believes that Washington is doing everything possible to contain China, Beijing will have less incentive to cooperate.

India²

Strategic Environment

Over the last two decades, India has emerged as a more powerful player in global politics. Its arrival as an overt nuclear-armed state has boosted India's status still further. But India continues to be beset with multiple internal and external security threats.

India has faced internal security challenges since the 1950s. Various ethnic communities in north-east India such as the Nagas, the Mizos, and others have sought to secede from the Indian Union. In

addition, in the northwest, India has faced serious rebellions in Punjab, Jammu, and Kashmir. Kashmir continues to face a low-intensity insurgency, and some sections of the valley continue to demonstrate intense anti-India feelings. Further, the rural "Maoist" or "Naxalite" insurgency has also afflicted many parts of the country, especially where the fruits of India's economic development have not fully filtered down. Overall, while India continues to face a number of internal rebellions, none are presently considered serious, though they require continuous monitoring.

India's international security environment is a reflection of both global politics and more immediate security threats. India's decisionmakers have argued that growing multipolarity is a welcome development and that, in a classic hedging strategy, India should pursue multiple cooperative relationships. In recent years, India's relationships with the United States, Japan, Australia, and Russia have all improved. Relations between India and China have been more complicated. They cooperate through international trade and in various multilateral fora, but they also have unresolved border issues and China's strategic relationship with Pakistan is a considerable irritant for India.

India does not officially identify external threats to itself, but the Indian defense secretary did recently state that the Indian military's "Operational Directive" requires the domination of one country in case of war and the deterrence of another. There can be little doubt that he was referring to Pakistan and China, respectively. Despite nuclearization, the possibility of another war with Pakistan cannot be ruled out, due to Pakistan's revisionist objective in Kashmir. The primary challenge that India faces from Pakistan is not a conventional military threat, but Pakistan sponsoring terrorism from under the cover of its nuclear capability. China is a more capable military power, but it is generally seen as a longer-term threat and a more responsible state than Pakistan.

² This section summarizes a paper on India's strategic environment and doctrine authored by Rajesh Rajagopalan of Jawaharlal Nehru University, New Delhi.

Key concerns include an unresolved border dispute, China's recent aggressiveness, as in the South China Sea, and China's military modernization. China and Pakistan's long-standing, tacit military partnership is a further problem. Such close collaboration has led Indian officials to begin considering the possibility that the two countries might collaborate in active hostilities, leading India to face the possibility of a two-front war.

Strategic Doctrine

India does not produce an official strategy document, but some outlines of strategy can be discerned. India's response to the above threats is largely reactive and defensive, with diplomacy playing an important role in both countering threats and in enhancing Indian capacities through strategic partnerships. Nuclear weapons play a very limited role, which is in deterring the threat posed by other countries' nuclear weapons.

India's response to domestic insurgencies has been mostly successful and India will likely continue its existing policies, which consist of some military pressure and a substantial focus on political and economic policies to reduce the underlying causes of rebellions.

On Pakistan and terrorism, Indian diplomacy has achieved the world's support and sympathy, but this has brought little by way of direct sanctioning of Pakistan's behavior by the international community. India's military approaches have not fared much better. The Indian army proposed what came to be dubbed the "Cold Start" doctrine that suggested a rapid military attack as a response to terrorist outrages. But this doctrine never had the needed political support and led to significant international concerns about the possibility of nuclear escalation, and the Indian government has formally disavowed it. Neither has India come up with a response to Pakistan's move to introduce tactical nuclear weapons, although there has been a significant debate in the Indian strategic community about how to respond. In sum, India's strategy toward Pakistan is reactive and defensive, with diplomacy playing a central role.

It should be noted, however, that over the last few months, India has responded much more robustly to Pakistan's alleged terrorist provocations, including by conducting what New Delhi characterized as a "surgical strike" on terrorists within Pakistan-controlled territory. Whether this represents a new paradigm in Indian policy remains to be seen.

To deal with any threat from China, India has sought to build strategic relationships with many countries in the Asia-Pacific region that also feel pressured by China's recent behavior, including the United States, Japan, Australia, Singapore, Taiwan, and Vietnam. These relationships are best understood as a form of "soft-balancing," not formal military alliances. India's military strategy for China is defensive, primarily focused on holding existing positions, rather than attempting to recapture its claimed territory occupied by China. To this end, India is attempting to strengthen its border defenses and air force.

Turning to strategic matters, India has been a reluctant nuclear power, unwilling to go down the nuclear path until its hands were forced by Pakistan's nuclear developments in the 1980s. Since becoming an overt nuclear power in 1998, India has begun focusing more attention on Beijing. India does not yet have missiles with sufficient range to target all of China from southern India. Similarly, although India has begun work on the sea-based leg of its triad, it is a long way from acquiring a true sea-based deterrent. Thus, India can be expected to continue to develop its capabilities for at least a couple more decades. These enhancements, however, will be gradual and do not suggest a rapid increase in the size of India's arsenal.

Nuclear weapons play a very limited role in India's strategy. India's nuclear strategy can be broadly characterized as "assured retaliation," and it seeks to use nuclear weapons purely for retaliation and hence emphasizes minimal, credible, and survivable nuclear forces. This strategic view of nuclear weapons is one reason why India has not responded to Pakistan's development of Theater Nuclear Weapons (TNWs) or responded to the pace of Pakistan's nuclear warhead development.

India has a declared nuclear doctrine. Its central element is the No First Use (NFU) pledge. The NFU is controversial, and there has been significant opposition to it among a vocal minority in the Indian strategic community, but there is little indication that the Indian government will consider changing it. India also emphasizes civilian control over nuclear weapons and employs a relaxed command and control arrangement, with weapons held in a de-alerted and de-mated posture, which increases both the safety and the security of these weapons. In addition, despite not being a party to the Nuclear Non-Proliferation Treaty (NPT), India continues its unblemished record on nuclear non-proliferation and has reiterated a continued commitment to nuclear disarmament.

Pakistan³

Strategic Environment

Pakistan's current security environment is shaped by a combination of political, economic, diplomatic, technological, and military trends, as well as by events and actors at the global, regional, and national levels. There is a visible and continuous shift in the global economic and industrial base and Western military capabilities from the Atlantic towards the Asia-Pacific. Pakistan believes that India, in pursuit of great power status, is excessively spending to build and advance its conventional and strategic forces, way beyond its regional security needs. Furthermore, the world's major nuclear powers continue to maintain and enhance the effectiveness of their nuclear arsenals. In addition, the development of ballistic missile defense systems, hypersonic cruise missiles, armed and stealthy drones, space militarization, evolution of non-kinetic capabilities, and cyber warfare, pose new challenges to the international and regional security environment. These global trends have negatively affected the regional balance of power, threatened strategic stability, and reduced the prospects for peaceful conflict resolution within the complex, conflict-prone, and nuclear-armed South Asian region.

Pakistan's security threat comes from India. The longstanding unresolved Kashmir dispute, despite various U.N. resolutions, lies at the heart of tensions between India and Pakistan. India's political elite, with its growing economy, is pursuing an ambitious and destabilizing military build-up, to become a global power and regional hegemon. New Delhi, emboldened by a Western-supported military build-up, is less willing to pursue a negotiated and peaceful resolution of the historic Kashmir dispute, while the Kashmiri people continue to struggle for their U.N.-recognized right of self-determination. The absence of a meaningful, sustainable, and result-driven dialogue and the growing strategic partnership between India and the United States are matters of grave concern for Pakistan.

In 1998, 24 years after testing its first nuclear weapon, India spent four times more on defense than Pakistan. Today, 42 years after its first nuclear test, New Delhi spends almost seven times more on its military than Islamabad. Moreover, India's growing conventional and strategic capabilities are overwhelmingly poised against Pakistan. The Indian "Cold Start" doctrine aims to rapidly launch shallow thrusts inside Pakistani territory in order to capture and use it for coercing Pakistan. The large-scale Indian development of highly-mobile and armored mechanized formations, artillery, rapid airlift capabilities, forward displacement of troops and garrisons, supporting communication infrastructure, and massive spending provide compelling evidence of operationalization of the "Cold Start" doctrine, despite Indian official reluctance to formally accept it.

India has the oldest, largest, and fastest-growing, unsafeguarded nuclear program of all non-Non-Proliferation Treaty states and the entire developing world. The most advanced, accurate, and operationally-ready Indian missiles can be employed against Pakistan more effectively than against China. Furthermore, Pakistan does not trust the declared Indian nuclear doctrine, owing to growing incon-

³ This section summarizes a paper on Pakistan's strategic environment and doctrine authored by Syed Muhammad Ali, Center for International Strategic Studies, Islamabad.

sistencies with its actual force posture and technical developments.

In addition, India is actively supporting terrorist and insurgent movements in Pakistan. Some Pakistani analysts also find it peculiar that significant terrorist incidents inside India or its held territories tend to occur whenever there is a high-level political or diplomatic engagement between Pakistan and India to reduce tensions or resolve disputes. Such incidents only allow India to blame Pakistan and are obviously neither in Islamabad's interest nor help the dialogue process, which is Pakistan's main demand. Lastly, the growing Indian security role within Afghanistan; expanding military cooperation with Iran, Central Asia, and Saudi Arabia; and the nuclearization of the Indian Ocean are additional developments of increasing concern to Pakistan.

Strategic Doctrine

All of Pakistan's civilian nuclear reactors, unlike India, have remained under perpetual safeguards. Pakistan developed its nuclear deterrence in response to India's nuclear weapon test in 1974. Pakistan's military program is thus reactive and defensive in nature. In 1998, in response to the Indian nuclear tests, Pakistan overtly established the credibility of its deterrence to leave no room for tragic miscalculation. An overt deterrence was essential in the interest of regional peace.

The purpose of Pakistan's nuclear program is to deter all forms of external aggression and to defend its sovereignty and vital national interests. The nuclear program is a guarantor of regional peace and complements national progress and prosperity. Pakistan does not have any extra-regional strategic ambitions, and it adheres to the principle of credible minimum deterrence. "Full spectrum deterrence" is a corollary of that principle, which involves development of a variety of nuclear weapons of different types and ranges to credibly deter India. Exercising minimalism, both high- and low-yield, short- and long-range nuclear weapons have been developed that are capable of penetrating all known types of active and passive missile defenses. This policy of maintaining

strategic balance and requisite force posture is meant to credibly ensure that no part of Indian territory or military remains invulnerable.

In order to dissuade, deter, and defeat these threats, Pakistan has taken various measures, developing and employing the full spectrum of military capabilities with a combination of both conventional and strategic measures. Pakistan has conducted the *Azm-e-Nau* series of military exercises, which helped develop a comprehensive and integrated response to emerging threat scenarios, such as India's "Cold Start" doctrine. The introduction of the *Nasr* short-range ballistic missile indicates that Pakistan's defense doctrine is based on an integrated and comprehensive concept in which both conventional and nuclear weapons have specific, but synergized roles. Therefore, Pakistan's defense doctrine should not be understood in terms of merely conventional capabilities or the deterrent role of its nuclear weapons alone, since both are available to the national leadership for appropriate employment in accordance with the nature, type, or level of the threat to the country's national security.

The growing economic and conventional asymmetry between India and Pakistan compels Pakistan to increasingly rely on its nuclear deterrent as a cost-effective factor of stability and a durable instrument of peace in the subcontinent. It is unlikely that Pakistan will depart from its longstanding posture of credible minimum deterrence, which is not only regionally sufficient but is also nationally desirable and affordable. Pakistan's nuclear arsenal is relatively modest in quantitative terms, but qualitatively-modern and sophisticated.

Pakistan ensures the credibility of its deterrence by maintaining opacity about the targeting, numbers, and alert status of its nuclear weapons. Pakistan's robust command, control, and communication architecture ensures positive and negative control over all types of nuclear warheads, at all times. Pakistan's nuclear arsenal is reported to be widely dispersed in numerous secure and secret locations across the country. Pakistan's nuclear arsenal is constantly se-

cured by a highly-trained, motivated, and specialized force, deployed in accordance with an elaborate, multi-layered, in-depth defense concept. It has developed an extensive and fool-proof personnel reliability program to guard against all forms of insider or other threats. This system is constantly reviewed for improved quality and greater vigilance.

Pakistan strictly adheres to the ideals of equitable arms control and non-proliferation and actively engages with the international community to promote nuclear security and improve international best practices. Pakistan firmly adheres to global non-proliferation principles and supports a criteria-based approach towards the further expansion of multi-lateral strategic export control regime and considers exceptionalism as discriminatory, dangerous, and destabilizing.

United States⁴

Strategic Environment

Today, Washington's security environment is much less benign than it was just a few short years ago. In a notable speech in Prague, Czech Republic, in 2009, U.S. President Barack Obama vowed that the United States would "seek the peace and security of a world without nuclear weapons." At the time of this statement, the international order was stable and conditions seemed to allow for a reduction in U.S. strategic forces and an overall de-emphasis of nuclear weapons in national security strategy. Since that time, however, new threats to U.S. security have emerged.

The most troublesome of these challenges comes from Russia, which has quickly transformed from a potential strategic partner into a clear adversary. Since 2014, Russia has invaded Ukraine and intervened militarily in the Syrian civil war. These moves are of even greater concern because of what they might reveal about Russia's broader intentions and because Moscow has backstopped these steps with an increased emphasis on nuclear forces.

The United States also faces new challenges in East Asia. North Korea's nuclear and missile capabilities continue to expand, threatening U.S. allies in the region and potentially putting the U.S. homeland at risk. The U.S. relationship with China has also become more competitive. While Washington continues to seek a cooperative relationship with Beijing, it is also concerned about China's activity in cyberspace, clashes with U.S. treaty-ally Japan, and its land-reclamation project in the South China Sea.

U.S. interests in the Middle East are threatened by renewed turmoil in the region. Most troubling for U.S. interests is Islamic State (ISIS), arguably the best organized and financed terror group in history. The greatest potential strategic threat in the Middle East, however, is Iran's uranium enrichment program. Now that the Joint Comprehensive Plan of Action, better known as the Iran nuclear deal, has gone into effect, Iran's nuclear program no longer poses an immediate challenge. But if the internationally agreed-upon limits to Iran's nuclear program were to be violated for any reason, the Iranian nuclear issue could once again become the subject of serious international attention.

Strategic Doctrine

According to the 2010 Nuclear Posture Review (NPR), U.S. strategic goals include: preventing nuclear proliferation and nuclear terrorism; reducing the role of U.S. nuclear weapons; maintaining strategic deterrence and stability at reduced nuclear force levels; strengthening regional deterrence and reassuring U.S. allies and partners; and sustaining a safe, secure, and effective nuclear arsenal. The Donald J. Trump administration may take nuclear policy in new directions, and the deteriorating security environment has opened up debates in Washington about whether the United States needs to take additional steps to reinforce deterrence. Still, much of U.S. strategic doctrine will likely remain constant.

Perhaps the most important of the above goals is the U.S. desire to maintain strategic deterrence and

⁴ This section summarizes a paper on the United States' strategic environment and doctrine authored by Matthew Kroenig of Georgetown University, Washington, D.C.

stability with Russia and China. Washington would like to deter attacks against the United States and its allies, reassure Moscow and Beijing that Washington is not seeking to undermine their nuclear deterrents, and also avoid costly and potentially destabilizing arms races.

While President Obama looked forward to a “world without nuclear weapons” in the aforementioned Prague speech, he also recognized that this goal will not be achieved in the near future. For this reason, the NPR states that so long as nuclear weapons exist, the United States will sustain a “safe, secure, and effective nuclear arsenal.” The United States has committed to retaining and modernizing all three legs of its strategic nuclear triad and to maintaining a small number of nonstrategic nuclear weapons. In addition, U.S. strategic posture includes regional and homeland missile defenses and the development of conventional prompt global strike capabilities. It must be emphasized that these capabilities contribute to regional deterrence and are not aimed at, nor will they meaningfully affect, the strategic balance between the United States and Russia or China.

To “reduce the role of nuclear weapons in U.S. national security strategy,” Washington remains open to further negotiated nuclear reductions with Russia. In addition, Washington has, among other steps, strengthened its negative security assurances and bolstered conventional capabilities as a means of deterring nonnuclear attack. To prevent nuclear proliferation and nuclear terrorism, Washington seeks to strengthen the nuclear non-proliferation regime, reverse North Korea and Iran’s nuclear ambitions, secure vulnerable nuclear materials worldwide, and pursue other related arms control efforts.

Turning specifically to Asia, the United States does not accept North Korea as a nuclear-armed state and its stated policy is to use multilateral diplomacy,

backed by pressure, to cap and then roll back North Korea’s nuclear capability. As long as North Korea maintains nuclear weapons, however, Washington must take steps to defend itself and its allies.

Another important U.S. priority in Asia concerns reassuring regional allies. The United States maintains longstanding, formal defense pacts with several states in Asia. Washington seeks to assure Japan and South Korea, in particular, that their security is adequately provided for through their alliance with the United States and also to dissuade these states from developing independent nuclear capabilities.

With regard to China, the United States continues to seek a stable strategic relationship. The United States understands that China will take whatever steps necessary to maintain an assured retaliatory capability, and Washington does not believe that U.S. programs, current or planned, would pose a threat to China’s nuclear deterrent. Washington does see potential dangers, however, as China expands and modernizes its nuclear arsenal. The only stable strategic equilibrium going forward, therefore, may be one in which China possesses a secure, second-strike capability (and Washington does not seek to undermine that capability) while the United States maintains a quantitative nuclear advantage (that China does not contest).

Unlike in East Asia, the United States lacks formal allies and potential competitors in South Asia. Washington does not feel threatened by India or Pakistan or their strategic capabilities. At the same time, Washington wants to help prevent these South Asian powers from engaging in military conflict, to encourage strategic restraint in what appears to be a growing arms competition, and to ensure strong nuclear export controls and high nuclear security standards to prevent the spread of sensitive nuclear technology to state or non-state actors.

Areas of Convergence and Divergence

Drawing on the papers on national strategic perspectives as well as discussions in Beijing and Doha, this section identifies areas of convergence and divergence among the four countries—not on specific issues but rather on broad principles, goals, and strategic postures.

Areas of Convergence

Participants believe that all four countries aspire to the following goals:

- Avoid war, especially nuclear war.
- Avoid terrorism, especially nuclear terrorism.
- Enhance nuclear security, to avoid “loose nukes” and thwart non-state actors from gaining nuclear weapons capabilities.
- Prevent inadvertent or accidental nuclear use.
- Reduce incentives for strategic arms competitions, especially by addressing causes.
- Promote strategic stability and strategic equilibrium.
- Prevent the proliferation of nuclear weapons capabilities to additional countries.
- Adopt strong and effective national export controls on nuclear materials and technology.
- Maintain nuclear forces at lowest levels consistent with national security, often described as credible minimum deterrence.
- Support the eventual elimination of nuclear weapons.

Areas of Divergence

The four countries also have differences in some areas:

- China and India maintain a nuclear No First Use policy, while Pakistan and the United States do not.
- The countries currently maintain their arsenals at different alert levels, including with regard to the practice of de-mating.
- The countries have different force postures and force levels.
- China and the United States are NPT member states, while India and Pakistan are not.
- China and the United States are permanent members of the U.N. Security Council, while India and Pakistan are not.
- India and the United States believe that missile defense systems can be stabilizing, while China and Pakistan believe missile defense to be destabilizing.
- The countries differ in the number of nuclear-armed adversaries they potentially face.
- The United States has treaty obligations that include extending nuclear deterrence to its allies.
- Only the United States has a history of nuclear arms control agreements, particularly with the Soviet Union/Russia.
- The countries differ on the implications of transparency for security, with the United States more supportive of transparency than the others.

Proposals for Strengthening Stability

This section contains proposals for strengthening stability that the group, by consensus, recommends as meriting consideration by their national governments. The proposals presented below were taken from the papers submitted by scholars from each country as well as from the discussion in Doha and Washington, D.C. The section is divided into two parts. The first lists quadripartite measures involving the four countries and, in some cases, other additional countries, and the second enumerates proposals applicable at the bilateral level.

Quadripartite U.S.-China-India-Pakistan Measures

- Pursue a dialogue on preventing further nuclear proliferation to additional countries.
- Initiate a track-two or track-one dialogue, involving China, France, India, Pakistan, Russia, the United Kingdom, and the United States, on stability, confidence building, and arms control.
- Pursue a dialogue on nuclear security and sharing of best practices.
- Explore a common position on the use of nuclear weapons and, in the meantime, declare that, at a minimum, all four countries would only consider using nuclear weapons in extreme circumstances and would not use nuclear weapons against non-nuclear weapon states.
- Undertake a joint political commitment, involving China, France, India, Pakistan, Russia, the United Kingdom, and the United States, not to carry out nuclear weapons tests to strengthen existing moratoria.
- Agree not to attack declared nuclear facilities, expanding on the 1991 non-attack agreement between India and Pakistan in which both countries annually exchange a list of nuclear facilities that would not be subject to attack.
- Agree not to conduct cyberattacks against critical infrastructure during peacetime and not to knowingly engage in cyber espionage for commercial gain, building on the 2015 agreement between the United States and China.
- Consider not to conduct cyberattacks against nuclear command and control.
- Agree to notify each other in the event that they suffer a cyberattack against critical infrastructure with serious consequences during peacetime.
- Agree to notify each other of nuclear accidents that may result in international, trans-boundary radiation release or have security implications, building on the 2007 India-Pakistan agreement.
- Study the broadening of existing missile test pre-notification arrangements to cover additional categories of missile tests in a step-by-step manner.
- Consider means of strengthening informal cooperation for interdicting illicit nuclear transfers in order to implement United Nations Security Council resolution 1540 and related resolutions.
- Agree to cooperate to prevent state support of terrorism.
- Agree to consider a step-by-step approach towards greater openness and transparency on strategic forces, consistent with national security requirements.
- Agree to notify each other in the event of a nuclear accident at sea.
- Agree to support an international dialogue on the code of conduct for outer space, including protection of space-based assets.
- Agree to participate in a dialogue on the implications of new technology on strategic stability.

Bilateral U.S.-China Measures

- Agree to a strategic equilibrium in which Washington does not attempt to negate China's nuclear deterrent and China will not seek quantitative parity with the United States.
- Agree to an institutionalized bilateral strategic stability dialogue to discuss the various components of strategic stability, including strategic offensive forces, missile defenses, space, cyber, and conventional prompt global strike capabilities.
- Participate in discussion of nuclear-related crisis management scenarios at the official or track 1.5 level.
- Consider expanding crisis communication mechanisms.
- Engage in dialogue on their respective approaches to civil nuclear cooperation with third countries to consider greater commonality in their nuclear export policies.
- Agree to joint exercises for maritime search and rescue.
- Agree to visits to U.S. missile defense installations, including radars.
- Agree that China would participate in practice inspections for the New START Treaty between the United States and Russia.
- Consider a dialogue on negative security assurances.

Bilateral China-India Measures

- Agree to a dialogue or exercises on maritime security.
- Agree to a dialogue on humanitarian assistance and disaster relief.
- Agree to consider notification of any tests of ballistic missiles.
- Engage in dialogue on their respective approaches to civil nuclear cooperation.
- Expand security related dialogue and confidence-building measures (CBMs).

Bilateral India-Pakistan Measures

- Agree to resume comprehensive dialogue and institutionalize it so that it is insulated from bilateral tensions.
- Consider the modalities and functions of risk-reduction centers.
- Agree not to weaponize space.
- Consider expanding existing CBMs to include an "incidents at sea" agreement.
- Consider measures for restraint and confidence building, where feasible.

Conclusions: Value of the “Strategic Chain” Concept

The Strategic Chain project—bringing together prominent Pakistanis, Indians, Chinese, and Americans to discuss the strategic interrelationships among their four countries—was an experiment. While pairs of these countries have previously met bilaterally at official and unofficial levels to address strategic matters, they have rarely, if ever, come together in a four-party format. The project sought to find out whether four-party discussions of arms control, non-proliferation, and other strategic questions would produce useful insights and practical policy recommendations for improving strategic stability.

The timing of the project was fortuitous given the growing geopolitical tensions among the four countries represented in the project. These tensions, some of which were discussed by the group, also impinge on the strategic and nuclear outlook of the four countries. To that extent, the project served as a useful platform to discuss differences.

Not surprisingly, the three rounds of in-depth discussions organized by the project did not resolve profound, underlying differences that in the past have fuelled tensions and impeded strategic restraint. Nonetheless, participants believed that the chain concept proved worthwhile for several reasons.

Discussions of bilateral strategic issues were often seen as having relevance and providing useful insights to the other participants. For example, U.S.-Chinese discussions about missile defense or crisis stability had instructive implications for India and Pakistan, and vice versa. Participants indicated that four-party interactions gave them a better appreciation of nuclear dynamics operating outside their own particular strategic contexts.

An objective of the strategic chain concept was to examine the degree to which actions taken with regard to one country might have unintended second- or third-order effects on other countries in the chain. It became clear in the course of the workshops that actions taken at one end of the chain may have an

impact at the other end. For example, participants noted that developments in U.S. strategic posture, such as missile defense and conventional prompt global strike, could lead to reactions in China, countervailing or imitative, which could produce corresponding reactions in India, which in turn could impact Pakistan’s strategic choices. Thus, it was suggested that restraint by the United States and China might be a necessary precondition for the adoption of certain types of restraints by India and Pakistan.

A tangible indication of the value of the strategic chain concept is the list of consensus recommendations, most of them regarding measures applicable to all four countries. One of the benefits of the project is that it called on participants to focus on bilateral measures already in place and then asked them to consider whether these bilateral arrangements could be expanded to cover all four countries. Several of the quadripartite recommendations were produced in this manner.

People often vote with their feet and the fact that high-level participants from all four countries chose to commit their limited time participating in three workshops on three separate continents demonstrates that they viewed these meetings as worthy of their time and effort. The participants believed the discussions were of high quality and indicated that they are inclined to introduce the strategic chain concept in their future academic and policy work on nuclear strategy and arms control.

Finally, the project provided the platform to establish a web of interpersonal connections among the participants, many of whom had not met previously. Indeed, these connections are already resulting in international collaboration on related projects.

Looking ahead, participants believed that there would be value to continuing the discussion and perhaps including experts from additional countries in any future meetings. Additions might include other nuclear powers linked to the chain, particularly Russia, and nonnuclear states, such as Japan and South Korea, that—through alliance or other relationships—bear on nuclear dynamics.

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A pioneer of India's nuclear forces, Air Marshal Ajit Bhavnani headed the Strategic Forces Command during its early years of inception. Bhavnani retired from the Indian air force as the vice chief and has served as a distinguished fellow at the Centre for Air Power Studies in New Delhi specializing in nuclear strategies. He has been an active partici-

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⁵ Retired Chinese diplomat Ambassador Wu Jianmin participated in two sessions of the group before his tragic death. Retired Pakistani diplomat Ambassador Masood Khan also participated in two sessions of the group before his election as President of Azad Jammu and Kashmir.

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Ambassador Sha Zukang was the United Nations undersecretary general for economic and social affairs. Before that, he was the permanent representative and ambassador of the Permanent Mission of the People's Republic of China to the United Nations Office at Geneva and Other International Organizations. He also established the Department of Arms Control of the Ministry of Foreign Affairs of China and served as its first director-general.

Annex A. China's Strategic Environment and Doctrine

Zhao Tong, *Carnegie-Tsinghua Center for Global Policy*

External Security Environment

U.S. as the Primary Security Concern

China has long seen the United States as the country that can seriously affect China's security interests and has seen the U.S.-China relationship as its most important bilateral relationship. China believes that regional stability depends on a solid relationship between the two countries. Since the 1990s, this bilateral relationship has been more about mutual economic interests than other issues. China and the United States have shared interests in promoting bilateral trade and investment, maintaining a stable international financial system, and promoting a strong and open global economy. However, major differences in ideology, political system, culture, and history have led the two countries to possessing quite different views and understandings on a wide range of political and security issues.

Although China is a major beneficiary of the U.S.-led global economic system, rapid economic growth has narrowed the power gap between Beijing and Washington, which contributes to the so-called "structural problem" between the top two economies in the world.⁶ Seeing a power transition between Washington and Beijing very likely in the mid- to long-term future, China worries that the deep ideological and political differences between the two countries will drive the United States to do everything to resist and prevent this power transition from happening. Such concern has led Beijing to suspect that Washington is implementing a systematic strategy to contain China. For example, the "rebalance to Asia" strategy of the Obama administration is, according to Chinese, a strategic move that primarily aims to use economic, diplomatic, and military means to contain the growth of Chinese influence in the Asia-Pacific. The U.S. ef-

forts to strengthen its alliance network in the region add to Chinese concerns.

U.S. Security Alliance

China acknowledges the fact that, through the security alliance system, the United States has prevented its allies such as South Korea and Japan from developing nuclear weapons. The U.S. security assurance to Japan, as part of the post-World War II arrangements, has also reduced the necessity for Japan to develop a "full-blown," independent arms force. However, from the Chinese perspective, the U.S. security alliance system in the Asia-Pacific region—despite the positive impact—represents a grave threat to China's security at the end of the day. China believes the United States has been using its alliance system for the purpose of containing China and undermining China's regional interests. From Beijing's view, the rebalance to Asia is the most recent effort by Washington to reinforce the alliance against a rising China.

China sees Washington's hand behind almost every regional confrontation involving China. Despite the stated U.S. policy of not having official positions on territorial disputes in the region, President Obama and senior administration officials repeatedly and openly stated that the Treaty of Mutual Cooperation and Security between the United States and Japan covers the disputed Diaoyu/Senkaku islands, and the United States would be obliged to defend them jointly with Japan. Similarly, the United States openly challenges China's territorial claim in the South China Sea, which from the perspective of China also contradicts the U.S. pledge of having no position on territorial disputes. The United States providing military equipment assistance to other South China Sea claimants and encouraging them to join forces and fight the Chinese claims together are additional indicators—from Beijing's view—of hypocrisy and ill intentions toward China. Without U.S. meddling, Beijing believes that tensions over the territorial disputes in the South China Sea and East China Sea would not be as high as they have become.

⁶ Jisi (王缉思) Wang, "Rising U.S.-China Structural Problem; Inevitable Strategic Competition (中美结构性矛盾上升, 战略较量难以避免)," (Peking University, Beijing: International and Strategic Studies Report (国际战略研究简报), July 23, 2010).

Beijing also suspects Washington has been supportive of the pro-independence Democratic Progressive Party (DPP) in Taiwan. With the DPP Chairwoman Tsai Ing-wen becoming the new president in Taiwan, Beijing worries that Washington's accommodating attitude toward Tsai will embolden her to take more defiant acts against Beijing's goal of promoting reunification. According to public polls in Taiwan, 13.6 percent of respondents identified themselves as Taiwanese rather than Chinese in 1991. The number has risen to 80 percent in 2016.⁷ The continuous shift of public perception and the coming into power of the new pro-independence government of DPP have made Beijing extremely concerned about the future of the cross-strait relationship and the role that Washington might play to exacerbate the problem. The decision by then-President-elect Donald Trump to take the congratulatory phone call from Tsai on December 2, 2016 broke a 35-year diplomatic protocol between Beijing and Washington and signalled a possible departure from the One China policy by the United States. The Chinese government and the general public reacted very strongly to Trump's surprising rhetoric about Taiwan that could greatly undermine the bilateral relationship.

Increasing Mutual Hostility between China and Japan

Since the beginning of the 21st century, the Sino-Japanese relationship continues to turn worse. In recent years, the relationship has deteriorated so quickly that it has undone decades of diplomatic efforts to build ties. History is certainly one major problem between the two, but increasingly intensive territorial disputes over the Diaoyu/Senkaku islands in the East China Sea have risen to be a more serious challenge. Since the nationalization of the disputed Diaoyu/Senkaku islands by Japan in 2012, China started to vehemently challenge Japan's de facto control over the islands by sending coastguard ships and airplanes to conduct regular patrols in nearby water and airspace. China's establishment of an air defense identification zone over part of the East China Sea in 2013 was

strongly protested by Japan and the United States. This perceived Chinese aggression further instigates nationalist sentiment among the Japanese public and elite. Tokyo responded with measures to raise the status and role of its armed forces and to accelerate military development and deployment programs. Leaders from the conservative ruling party in Tokyo seem to have lost faith in seeking a normal relationship with Beijing and appear determined to conduct value-oriented diplomacy, striving for a "coalition of democracies" to counter China. With Washington showing a green light, the Abe government embraces rights for collective self-defense, relaxes restrictions on weapons export, and puts in place new security laws to allow the self-defense force to play a bigger role in regional and international security contingencies. Given this trend, China is deeply worried that Tokyo is moving to revise the pacifist constitution in place since the end of World War II. In the long run, China is concerned that Washington and Tokyo will increasingly use their strengthened alliance and forward-deployed military capabilities to interfere in territorial disputes in East and South China Seas and to check China's influence in the region.

Southeast Asia and the South China Sea

Southeast Asia is another region where China believes the United States is deliberately stirring up tensions to forge a coalition against China. Contrary to the Western portrait of China as pursuing expansionist objectives in the South China Sea, China firmly believes it is merely defending its long-held positions. The People's Republic of China (PRC) inherited the territorial claims over the South China Sea from the Republic of China (ROC) government after the latter retreated to Taiwan in 1949 and never expanded its claims in the decades after. In fact, the Taiwanese government today sticks to the same territorial claims in the South China Sea as the PRC government does but is rarely criticized by Western countries as having "expansionist" ambitions. This confirms Chinese suspicion that the West is acting against the PRC for geopolitical reasons.

⁷ James Griffiths, "What's in a Name? Anger in Taiwan over 'Chinese Taipei' Olympics Moniker," CNN, <http://edition.cnn.com/2016/08/05/sport/taiwan-olympics-chinese-taipei/>.

From the Chinese perspective, the U.S. government supported the ROC government's claims over the South China Sea after the end of World War II and other Southeast Asian countries never opposed China's claims until the 1970s. In the Vietnamese case, it was the official policy of the communist Vietnamese government that China has sovereign right over the Spratlys and Paracels until Vietnam changed its position later. Over the last few decades, it was the other claimants that had built and expanded artificial structures on the land features they occupied and station troops on them, and China was the restraining one. As a result, Beijing views its recent land reclamation projects as a long delayed response in order to stop the status quo from being further changed to the favor of other claimants.

In addition, Western countries have suspicions about the Chinese call for direct negotiations with other claimant countries, preferably on a bilateral basis. They believe this is a tactic by China to coerce its weaker negotiating partner to compromise in an asymmetric negotiation. However, the facts are that China has not employed such tactics in its previous territorial negotiations with either stronger or weaker neighbors. In fact, with the exception of India, China has successfully settled all land territorial disputes with its neighbors, and in many of such negotiations, China was willing to make bigger compromises to accommodate its smaller negotiating partners. It was due to this experience that Beijing believes that direct negotiation between disputed parties is the most effective way to resolve territorial disputes, especially when the disputes are extremely complex in the South China Sea, and having multiple players all at the table at the same time would only increase the difficulty. Therefore, China views the Western call for all the other claimant countries or even all ASEAN countries to work together to pursue negotiations with China as at least not a sincere effort to help resolve differences.

More seriously, the United States has stepped up its freedom of navigation operations in the South

China Sea, and it continues to do so even in periods when tensions have somewhat reduced among the direct claimants. This convinces China that the United States is not promoting any peaceful resolution but instead is aiming at stirring up tensions, playing a leading role to counter China directly. Facing this perceived threat, the People's Liberation Army (PLA) has increasingly talked about being ready for military crises, contingencies, and even wars. Top PLA officials have inspected the newly established Southern Theater Command and the South Sea Fleet. Unprecedented large scale joint military exercises were held in the South China Sea, and domestic public support for standing up against perceived U.S. intervention is at a historical high.

Nuclear Threat

Against the backdrop of increasing geostrategic contentions surrounding China, China also sees itself fighting an uphill battle to maintain strategic stability with the United States—its primary rival—and to deal with other new nuclear challenges.

New Nuclear Challenges from Non-Nuclear Technologies

For the past few decades, China was willing to maintain a small nuclear arsenal, partly because nuclear weapons were vulnerable almost only to nuclear strikes. However, the emergence of various non-nuclear military technologies poses an unprecedented threat to nuclear weapons and is seriously undermining Chinese confidence in the survivability and credibility of its nuclear deterrent. Among these non-nuclear technologies, missile defense and conventional prompt strike weapons are of most concern to China. Among the 200 or so Chinese nuclear weapons, only a fraction of them are intercontinental ballistic missiles (ICBMs) that are capable of striking the continental United States.⁸ If the United States launched a preemptive first strike against China, potentially very few such ICBMs could survive and be available for a retaliatory second strike against the United States. In this case, even a

⁸ Hans M. Kristensen and Robert S. Norris, "Chinese Nuclear Forces, 2015," *Bulletin of the Atomic Scientists* 71, no. 4 (2015).

small-scale U.S. missile defense system might be sufficient to shoot down all remaining Chinese ICBMs and therefore be capable of completely neutralizing China's nuclear deterrent. Regarding conventional prompt strike weapons, the Chinese concern is that these weapons could be used to target and destroy China's road-mobile, nuclear missile transporter-erector-launchers (TELs). The U.S. conventional prompt global strike (CPGS) systems, for example, are extremely accurate weapons and can adjust their trajectories during flight to target moving vehicles. Given that China is putting an increasingly higher proportion of its nuclear weapons on road-mobile missiles, conventional prompt strike weapons pose a considerable challenge for China to maintain a survivable nuclear deterrent.

There are other new technologies under development that can threaten China's second strike capabilities in the future. For instance, senior U.S. officials are openly talking about the possibility of using cyber strikes to interfere with and disable an enemy's nuclear command and control system, in order to prevent the enemy from launching nuclear missiles. This so-called "Left-of-Launch" operation can bolster the U.S. missile defense capability by preventing the enemy from launching their missiles in the first place. Such new technologies are heavily drawing Chinese concern.

Maintaining Strategic Stability with the United States

The primary goals of China's nuclear forces have been to deter the United States from launching a nuclear first strike against China and to maintain strategic stability with the United States. Given the considerable asymmetry of the two countries' nuclear capabilities, China has been worrying that the United States could launch a first strike to disarm China's entire nuclear arsenal. The leaked Nuclear

Posture Review report of the George W. Bush administration identified China as one of the nuclear target countries. Under the Obama administration, it has been reassuring to China that the 2010 Nuclear Posture Review report and the subsequent Ballistic Missile Defense Review report both commit the White House to maintaining a strategic stability relationship with China for the first time. During Track 2 and Track 1.5 dialogues, American officials acknowledged that Washington is willing to accept a mutual vulnerability relationship with China. Some former senior officials also admit that mutual vulnerability with China is already a fact to face rather than a choice to make. With that said, some American experts continue to challenge such statements by claiming that the United States possesses the capability to conduct a nuclear first strike against China and argue that maintaining nuclear primacy over China and other countries better serves U.S. security interests.⁹ At the operational level, U.S. Navy officials have expressed interest in maintaining a capability to constantly track and hold Chinese nuclear ballistic missile submarines at risk.¹⁰ All these statements and operations undermine Chinese confidence about U.S. sincerity in maintaining strategic stability with China.

Japan and South Korea's Nuclear Potential

Although it is difficult to measure to what extent the Chinese government is really concerned about Japan's capability to build nuclear weapons, it seems many Chinese strategists and experts are genuinely concerned.¹¹ Despite the fact that the huge plutonium stockpile that Japan possesses is reactor-grade plutonium and not ideal for building nuclear weapons, Chinese experts argue that Japan's advanced engineering and industrial capability makes it easy for Japan to overcome any technical difficulty in turning reactor grade plutonium into nuclear bombs. Japan also possesses advanced rocket technology

⁹ Keir A. Lieber and Daryl G. Press, "The Nukes We Need: Preserving the American Deterrent," *Foreign Affairs* 88, no. 6 (2009); "U.S. Nuclear Primacy and the Future of the Chinese Deterrent," *China Security*, no. Winter (2007).

¹⁰ David S. Cloud, "Aboard a U.S. Nuclear Sub, a Cat-and-Mouse Game with Phantom Foes," *Los Angeles Times* September 25, 2015.

¹¹ Wansheng (徐万胜) Xu and Zhengnan (付征南) Fu, "The Tendency of Japan's Nuclear Policy (日本核政策动向)," *Contemporary International Relations* (现代国际关系) 4 (2008); Kesheng (吴克生) Wu and Desheng (文德盛) Wen, "The Direction of Japan's Nuclear Weapons Policy (日本核武器政策取向)," *Contemporary World* (当代世界), no. 7 (2004); Xiangli (孙向丽) Sun, Jun (伍钧) Wu, and Side (胡思得) Hu, "Japan's Plutonium Issue and International Concern (日本钚问题及其国际关切)," *Contemporary International Relations* (现代国际关系), no. 3 (2006).

and the capability to retrieve satellites—the capability that China believes could have been used to understand the technology for building warhead re-entry vehicles for long-range ballistic missiles. Looking at all of these technologies, China believes that Japan is at least interested in obtaining a nuclear hedge capability—meaning Japan does not need to go as far as building actual nuclear weapons, but it gives itself the option of quickly doing so if/when it is necessary. Within Japan, conservative right wing politicians call for Japan’s own nuclear deterrent capability; and outside Japan, conservative scholars from the United States, Australia, and other countries have also openly advocated for Japan to develop its independent nuclear weapon capability.¹² All of these developments concern China.

Besides Japan’s own nuclear potential, China also worries that Japan is actively contributing to the U.S. efforts to threaten China’s nuclear deterrent capability. For instance, Japan has been the most important and active partner of the United States in the Asia-Pacific region in conducting anti-submarine-warfare (ASW) operations. As China’s nuclear ballistic missile submarines (SSBNs) become an important part of China’s survivable nuclear second strike capability, Japan’s cooperation with the United States to track and threaten China’s SSBNs draws Chinese concern. In addition, Japan is an important partner in the development and deployment of U.S. missile defense systems. Japan contributes to the development of the U.S. SM-3 missile defense system, the most advanced version of which will be deployed on Japan’s Aegis-capable vessels. Japan has also deployed two AN/TPY-2 X-band radars on its territory while expressing interest in deploying other advanced missile defense assets, such as the Terminal High Altitude Area Defense system (THAAD) or the Aegis-ashore system, in Japan in the near future. China views Japan’s active participation in the U.S. missile defense network in the region as at least partially intended to undermine Chinese security interests.

Similarly, China also worries that South Korea secretly embraces a nuclear hedge strategy by seeking to possess the capability to develop nuclear weapons through the development of full nuclear fuel cycle capability. China also suspects that South Korea has decided to side more firmly with the United States by choosing to join the U.S. missile defense network and to deploy the THAAD system on its territory. The recent dispute over THAAD has quickly become a major political problem between Beijing and Seoul and has greatly undermined the Sino-ROK relationship.

Instability on the Korean Peninsula and the South Asia Subcontinent

On the Korean Peninsula, China worries about North Korea’s nuclear capacity, as well as the instability that military actions by the United States and ROK may cause, due to the fact that nuclear security threat, refugee flow, and political chaos all endanger China’s near- and long-term interests. At the same time, China believes that upholding nuclear nonproliferation principles is in the ultimate interests of China and the international community writ large, and China is willing to apply the strictest export control and economic sanction measures that directly target North Korea’s nuclear and missile programs. With that said, China fundamentally disagrees with the United States and others that North Korea is the only one to be blamed for choosing the nuclear path and for the existing impasse in diplomatic talks. China also does not believe that more economic sanctions targeted generally at North Korea’s civilian trade and economy can bring North Korea to change its position. Western pressure on China to cut off North Korea’s economic lifeline—if China complies—would inevitably turn China into North Korea’s enemy. Therefore, Beijing sees the Western demand for China to impose “sweeping” sanctions against North Korea as very unfair and risky for China.

¹² Doug Bandow, “Let Them Make Nukes: The Case for “Friendly” Proliferation,” *Foreign Affairs*, <https://www.foreignaffairs.com/articles/japan/2016-07-26/let-them-make-nukes>; Harvey M. Sapolsky and Christine M. Leah, “Let Asia Go Nuclear,” *The National Interest* (April 14, 2014).

How China chooses to deal with North Korea also depends on the overall U.S.-China relationship. If Beijing believes that Washington is doing everything possible to contain China by, for example, instigating tensions in South China Sea and deploying missile defense network in the region, Beijing will have less incentive to cooperate with Washington over North Korea. If that becomes the case, the risk of a new Cold War emerging in the region between Russia, China, and North Korea on one side and the United States, Japan, South Korea, and maybe others on the other side will be greater.

Over South Asia, China for a long time has not paid much attention to the nuclear competition between India and Pakistan. This may change in the future. India has been measuring its nuclear and strategic military capabilities against China, and the nuclear gap between China and India seems to have been narrowing over the past decades. In particular, the rapid development of India's long-range ballistic missiles, the development of multiple independently targetable re-entry vehicles (or MIRVs) on ballistic missiles, submarine-based nuclear weapons, missile defense systems, and outer space capabilities have begun to draw increasing Chinese attention and concern. China also fears that the widening nuclear and conventional military gaps between India and Pakistan may also exacerbate regional imbalance and threaten stability. As China significantly increases its investments in the region, through the China-Pakistan Economic Corridor and other investment projects, China has begun to hold much greater stakes in the overall stability of the region. The combination of terrorism and the nuclear security threat has drawn increasing Chinese concern as well.

Evolution of China's Nuclear Strategy and Policy

China never officially names its nuclear strategy, although most scholars believe China adheres to a

strategy of minimum nuclear deterrent because of the fact that China has maintained a very small nuclear arsenal for decades and that Chinese top leaders have repeatedly indicated that China only wants a small nuclear arsenal to deter others from using nuclear weapons against China.¹³

Some Chinese experts believe that China's nuclear deterrent has been based on uncertain retaliation—a capability that is not sufficient to guarantee a nuclear retaliation but also plants serious doubt in an enemy's mind that it can absolutely destroy all Chinese nuclear weapons in a first strike.¹⁴ Such experts argue that, for decades, China was satisfied with its uncertain retaliation capability because no one would ever risk the catastrophic consequences of even an uncertain nuclear retaliation to launch a nuclear first strike against China. However, as China's economy grows and China has much greater resources to spend on military modernization, China is heading toward achieving an assured nuclear retaliation capability. This is a major driving force behind China's nuclear modernization programs in recent decades.

Besides, China believes that new non-nuclear military technologies are posing serious threats to China's existing nuclear deterrent capability. Concerns about U.S. missile defense and conventional prompt strike weapons have been driving Beijing's investment into its nuclear modernization programs.

Additionally, China has been following in the steps of the other major nuclear powers in developing new nuclear technologies, sometimes for the sake of mastering these technologies themselves rather than actually deploying them. After going through the so-called “hundred years of foreign invasion and national humiliation,” Chinese leaders have developed this belief that China cannot afford to lag behind other major powers on important defense technologies, and China needs to always master the same

¹³ Li (王莉) Wang, “Factors Behind the Evolution of China's Nuclear Strategy During the Mao Zedong and Deng Xiaoping Era (毛泽东与邓小平时代的中国核战略演进动因分析)” (Foreign Affairs University, 2011); Jiayu (张家裕) Zhang, “An Analysis of the Nuclear Strategic Thinking of Mao Zedong and Zhou Enlai (试论毛泽东、周恩来的核战略思想),” *Military History Research* (军事历史研究), no. 02 (1989).

¹⁴ Riqiang Wu, “Certainty of Uncertainty: Nuclear Strategy with Chinese Characteristics,” *Journal of Strategic Studies* 36, no. 4 (2013).

military technologies as the other big powers simply in case some of these technologies showed the potential to dramatically shift the existing military balance that could leave China once again at a major disadvantage.¹⁵

For all these reasons, China has achieved major breakthroughs in nuclear capabilities in recent decades. China has deployed advanced road-mobile ICBMs DF-31s and DF-31As and is reportedly developing another more powerful road-mobile ICBM DF-41 with a longer range. China has recently deployed MIRVed silo-based ICBMs DF-5Bs, which could improve China's capability to penetrate U.S. missile defense systems. In addition to land-based nuclear weapon systems, China has built a relatively modern SSBN fleet, which is armed with JL-2 submarine-launched ballistic missiles. China's 094 class SSBN has reportedly conducted its first patrol this year, and China's engineers are constantly working on updating each subsequent boat they build to improve their quietness and survivability.

With a changing geostrategic environment and improving nuclear capabilities, there is internal debate in China about future nuclear postures. For example, as China becomes increasingly concerned about the threat of U.S. conventional strikes against Chinese nuclear forces, some scholars argue that China should adopt a more flexible nuclear posture by adding conditionality to its categorical No First Use policy.¹⁶ The Chinese government has rejected any change to its unconditional No First Use, but domestic debates have already drawn international attention. Similarly, some PLA scholars have started pointing to the U.S. and Russian practice of keeping nuclear weapons on constant alert and arguing that China should improve the rapid response capability of its nuclear forces. They contend that China should also develop a strategic early warning system and, if necessary, shift to the Launch Under Attack or Launch On Warning posture to increase the cred-

ibility of its nuclear deterrent.¹⁷ Such thinking has not become national policy but it shows that China's nuclear thinking is increasingly influenced by Western writings and doctrines. Some of this new thinking could cause China's nuclear posture to deviate considerably from its traditional practice that once emphasized low alert levels and moderate postures.

Conclusion

In sum, China sees itself facing a more challenging strategic security environment. It believes the United States adopts a containment strategy to check the growth of China's capability and regional influence. From Beijing's perspective, the United States is doing so not only by itself but also through enhancing its alliance system in the Asia-Pacific and encouraging neutral countries in the region to side with the United States against China. Maintaining strategic stability with the United States becomes ever more difficult. Japan, South Korea, North Korea, and South Asia also all present various nuclear challenges for Beijing. Such geostrategic threats and new non-nuclear technologies are all driving China's nuclear modernization program. China is facing challenging tasks to safeguard its nuclear deterrent and also to avoid adopting destabilizing postures that could undermine its own interests.

¹⁵ Li Bin, "Chinese Thinking on Nuclear Weapons," *Arms Control Today* 45, no. 10 (2015).

¹⁶ Yunzhu Yao, "China Will Not Change Its Nuclear Policy," (China-US Focus, Apr 22, 2013); Gregory Kulacki and Jeffrey Lewis, "不首先使用核武器: 中美核对话的困境与出路 (Nfu in Sino-U.S. Nuclear Dialogue: Dilemma and Way out)," 外交评论 (*Foreign Affairs Review*) 29, no. 5 (2012).

¹⁷ Gregory Kulacki, "The Chinese Military Updates China's Nuclear Strategy," (Boston, MA: Union of Concerned Scientists, March 2015).

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Annex B. India's National Security Perspectives and Nuclear Weapons

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Over the last two decades, India's economy has grown much faster and it has thus emerged as a much richer and more powerful state in global politics. India's nuclear tests in 1998 and its emergence as an overt nuclear-armed state boosted India's status further. But India's rise has not necessarily reduced its insecurity: India continues to be beset with multiple internal and external security threats that its increased power and capability have not been able to fully meet. India's approach to dealing with these security threats has not changed much either, reflecting some of the enduring dilemmas of India's security problems as well as India's institutional capacity to meet these threats.

In this brief paper, I first outline India's national security environment, which encompasses internal security concerns, the broad international political conditions that India faces, and external military threats that India faces. In the subsequent section, I outline India's defense doctrine and strategy before elaborating on the role that nuclear weapons play in India's security policy.

India's Internal Security Concerns

India has faced internal security challenges since the 1950s. Various ethnic communities in Northeast India such as the Nagas, the Mizos, and others have sought to secede from the Indian Union. None of these have been successful: India has used a combination of military and political measures to deal with such threats. Militarily, India sought to defeat the insurgents with a strategy that emphasized limited use of force that isolated the militants from the population. Politically, the Indian government gave a number of concessions that reduced the salience of the demands made by the separatists, including the creation of new states, greater political autonomy, increased developmental

funds, and locally elected leadership. Many of these insurgencies continue, though at a fairly low intensity. None of these insurgencies are today considered serious threats to Indian integrity, though they require continued security monitoring.

In addition to the Northeast, India has also faced serious rebellions in Punjab, and in Jammu and Kashmir. Again, neither represent serious threats to India today. The Punjab rebellion ended in the early 1990s, and the state appears to be largely quiet today, though there have been some indications of attempts at restarting the rebellion. Kashmir continues to face a low-intensity insurgency and some sections of the Valley continue to demonstrate intense anti-India feelings. Though India continues to deploy a large number of troops in the region, the situation has vastly improved from even a few years ago.

Another serious internal security threat that emerged over the last two decades is rural "Maoist" or "Naxalite" insurgency that afflicted many parts of the country, especially where the fruits of India's economic development have not fully filtered down. The Maoist insurgency is not a secessionist movement but rather seeks to overthrow the Indian state with a radical left-wing popular rebellion. At one point, Indian leaders such as then-Prime Minister Manmohan Singh characterized this as the most serious internal security challenge the country faced.¹⁸ However, the appeal of this movement was always limited to the rural areas, and its capacity to grow was limited. In addition, an Indian police response (the army was not used to respond to this rebellion), accelerated economic and infrastructural developments as well as internal disputes within the Maoist groups have significantly weakened it. The Maoists are no longer considered a serious threat, though the movement itself continues.

Overall, then, though India continues to face a number of internal rebellions, none are presently considered very serious, though they require continuous monitoring.

¹⁸ "Naxalism biggest threat to internal security: Manmohan," *The Hindu*, May 24, 2010

India's International Strategic Environment

India's security environment is a reflection both of the general conditions of global politics and the more immediate security threats that India faces from across its own borders. India's strategic decision-makers have argued that growing multipolarity is a welcome development and that given India's position, "simultaneous pursuit of multiple relationships creates a virtuous cycle where each can drive the other higher."¹⁹ This is classic hedging strategy, but in reality, India's relationship with the United States has progressed much farther and it is now much deeper than at any time before. India managed to use American power to modify global rules in such a way as to allow it to participate in nuclear commerce despite the fact that it is a nuclear-armed power that is not a Nuclear Non-Proliferation Treaty (NPT) signatory. The United States is now one of the largest arms suppliers to India in terms of value, and India conducts more military exercises with the United States than with any other country. The relationship has cooled somewhat at the political level during the Obama administration compared to the Bush administration, but still India and the United States now see eye-to-eye on many crucial areas, especially in areas such as maritime security, freedom of navigation, and over-flights in the Asia-Pacific, and both sides have opposed the threat or use of force to settle disputes in the region, a not very subtle signal about the South China Sea dispute.

Despite this close relationship with the United States, India has also managed to maintain a very robust security and political relationship with Russia. There is a natural strategic comfort in this relationship that belies the many minor irritants, including disputes over contractual negotiations in arms supplies. Though officially India is very comfortable with the state of this relationship, it is possible that there are some difficulties ahead as Russia gets increasingly close to China. India has yet to grapple with the implications of these new developments, possibly hoping that these are temporary de-

velopments, making it unclear as to what impact it might have on India's strategic policy. If continuing tensions between Russia and the West drives Russia closer to China, it could have serious implications for India.

India's relationship with other key countries in the Asia-Pacific has also improved significantly. Throughout the Cold War period India maintained a correct but cool relationship with countries like Japan and Australia, seeing them as part of the U.S. alliance structure in the region. Relationships with these countries suffered in the immediate aftermath of the 1998 nuclear tests, when both countries took a harsh line on the Indian nuclear test, much harsher than even the United States. But as India's relationship with the United States improved, it had a positive effect also on India's ties with Japan and Australia. To some extent, increasing anxiety in Tokyo and Canberra about China's rise also played a role in the improvement of ties. Officially, India has expressed caution about creating any kind of anti-China front in the region. Indeed, after China objected to India's 2007 multilateral naval exercises, India was careful not to hold naval exercises that included the United States along with multiple Asian countries. India did hold another Malabar naval exercise in October 2015 which included Japan and the United States. India has also held a number of bilateral military exercises with various countries, including with Australia in September 2015. If China's behavior in the region continues to be aggressive, India's relationship with other Asia-Pacific powers can be expected to intensify.

Perhaps India's most crucial and complicated relationship over the medium term is the one with China. India and China share a very robust and improving trade relationship and they are partners in various multilateral fora such as the Shanghai Cooperation Organization (SCO), BRICS (Brazil-Russia-India-China-South Africa) and BASIC (Brazil-South Africa-India-China), and India has joined the Asian

¹⁹ Ministry of External Affairs, "Remarks by Foreign Secretary at the release of Dr. C. Raja Mohan's book 'Modi's World: Expanding India's Sphere of Influence'," July 17, 2015.

Infrastructure Investment Bank (AIIB), a Chinese initiative. The two countries also exchanged state visits, with President Xi Jinping visiting in 2014 and Prime Minister Narendra Modi returning the visit in 2015. But there are also significant challenges facing the two countries: India and China have unresolved border issues which periodically lead to confrontations between troops on both sides. In addition, China's "all weather" strategic relationship with Pakistan is a considerable irritant for India, while India's increasing closeness to the United States is a source of concern in Beijing. India views some Chinese initiatives, such as One Belt, One Road (OBOR), with some suspicion, just as China looks askance at India's evolving relationship with Japan, Australia, and the Southeast Asian region. India finds the China relationship "more nuanced, more complex" and one in which improvements can take place only if both sides "showed respect and sensitivity to each others' concerns, interests and aspiration."²⁰

Broadly, therefore, India faces an Asian balance that is in an unusual flux that makes it difficult to define exactly where India's interests lie, necessitating what is essentially a hedging strategy. Still, despite Indian protestations, there is little doubt that India worries more about China than the United States, and that this imbalance of concern drives India into a much closer relationship with the United States as well as with a number of other powers in the Asia-Pacific.

External Security Threats

The external security threats that India faces are essentially two: Pakistan and China, and—at least in the short-term—in that order. The relative weight to be given to these threats has been an unresolved issue in Indian strategic planning since independence. Like many countries, and for obvious reasons, India does not officially or explicitly identify external

threats to India. But the Indian defense secretary did recently state that the Indian military's "Operational Directive" requires the military to dominate one country in case of war and deter another.²¹ In the context of India's strategic circumstances, there can be little doubt that he was referring to Pakistan and China, respectively.

India fought three major wars with Pakistan, in 1947-48, 1965, and 1971, and a border skirmish in 1999 that lasted six weeks. Despite nuclearization, the possibility of another war with Pakistan cannot be ruled out because of Pakistan's revisionist and irredentist strategic objective in Kashmir. But it is not just the nuclear equation that India has to worry about: though Indian conventional forces are larger than what Pakistan can muster, the Indian conventional military superiority over Pakistan is not substantial.²² According to some assessments, the Indian military superiority is not sufficient for India to conduct any effective offensive against Pakistan, even in the context of possible Pakistani sponsorship of further terrorist attacks on India.²³ Continued delays in India's arms procurement ensures that the situation will not improve in the short-term future. It should be reiterated, however, that this refers to Indian capability in an offensive war against Pakistan: current Indian military capability is more than adequate for any open conventional threat that Pakistan might pose.

But the challenge that India faces from Pakistan is not so much a possible conventional military threat as much as Pakistan sponsoring terrorism from under the cover of its nuclear capability. The Ministry of Defense's Annual Report identified "the expanding footprints of extremist and terrorist organisations in Pakistan and their linkages with terrorist activities in J&K [Jammu and Kashmir, as India refers to the Kashmir region] and rest (*sic*) of India" as a "major

²⁰ Ministry of External Affairs, "IISS Fullerton Lecture by Dr. S. Jaishankar, Foreign Secretary in Singapore," July 20, 2015.

²¹ Standing Committee on Defense, 16th Lok Sabha, *Second Report: Demands for Grants (2014–2015): General Defense Budget* (New Delhi, December 2014), 19.

²² Christopher Clary, "What might an India-Pakistan war look like?" *Precis*, Spring 2012, http://web.mit.edu/cis/precis/2012spring/india_pakistan.html#.Vsci1Wduk2w.

²³ Walter C. Ladwig III, "Indian military modernization and conventional deterrence in South Asia," *Journal of Strategic Studies* (2015).

security challenge to India.”²⁴ After both countries became openly nuclear-armed in 1998, New Delhi has appeared constrained in responding militarily to such provocations, though it did undertake an unprecedented full-scale mobilization after a terrorist attack on the Indian parliament in December 2001. Thus the key strategic challenge that India faces is the combination of Pakistan’s nuclear capability and its support of terrorists targeting India. Though Pakistan’s nuclear program began as a response to the strategic imbalance in the region, since acquiring the nuclear capability, Pakistan has sought to leverage this capability—and the worries of the global community about a potential nuclear escalation in the region—to put pressure upon and gain concessions from India. This has been a somewhat effective strategy, at least in so far as India has found it difficult to respond to this combination of terrorism and the threat of nuclear escalation. Though India responded effectively and with force when Pakistani forces attempted to change the territorial status quo in Kargil in 1999, even in this case of a direct invasion, India limited its response to its own side of the Line of Control. But fear of nuclear escalation prevented India from responding to subsequent terror attacks on the Jammu and Kashmir State Assembly, on the Indian Parliament, on Indian military establishments, and on Mumbai, as well as many other less serious attacks.

The logic of Pakistan’s terrorism strategy is unclear because it has not and cannot have either the potential to weaken India or force India to concede to Pakistan’s demands on Kashmir. These attacks have had little impact on India’s economic growth, the basis for Indian power. To the extent that the trajectory of India’s economic growth rates is adversely affected, it is more by the inadequacies and problems of India’s economic policies rather than by the various terrorist attacks that India has suffered. And clearly, it has had little effect on reducing and diminishing India’s military capabilities. The other alterna-

tive is that Pakistan hopes that terrorism, by holding out the threat of nuclear escalation, will likely force international intervention on the Kashmir issue. But this has also repeatedly shown to be ineffective. The truth is that even if there is international pressure, India is unlikely to succumb on an issue as crucial as Kashmir. But even the likelihood of international pressure are near zero because Pakistan’s fingerprints on terrorism is so clear that key foreign governments have blamed Pakistan for the crises that resulted.²⁵ If anything, India has repeatedly garnered international support because it is seen as the victim of terrorism. In an international climate in which terrorism is seen as a serious global threat, there is little sympathy for such actions, especially when these are done with state support. And to the extent that any international pressure might exist, it is likely to be limited to preventing a war or limiting one if it has already started (as happened in the Kargil case) rather than in resolving the Kashmir issue.

Thus, the strategic logic of Pakistan’s support for terrorism against India remains unclear. We are forced to conclude that there might indeed be no great strategic logic at work here: rather, key elements of Pakistan’s security establishment might be supporting such terrorism more for the psychic satisfaction it brings rather than because of any great strategic logic. At best, Pakistani terrorism demonstrates the inadequacies and incompetence of the Indian state in defending its territory and citizens but while this may embarrass the Indian state in the eyes of its citizens, it hardly brings much benefit to Pakistan. Pakistan’s defense against accusations of terror-sponsorship is that it suffers more from terrorism than India does. This is both true and irrelevant: the damage that terrorism causes to Pakistan is not the consequence of Indian support for terrorism in Pakistan, unlike the reverse. Moreover, domestic Pakistani terrorism is the direct result of Pakistan’s own support of various terrorist groups that have now escaped state control and metastasized into a threat

²⁴ Ministry of Defense, *Annual Report 2014–2015* (New Delhi: Government of India, 2015), p. 6.

²⁵ See, for example, the detailed *New York Times* reporting about the intelligence information on the Mumbai terror attacks in James Glanz, Sebastian Rotella and David E. Sanger, “In 2008 Mumbai attacks, piles of spy data, but an uncompleted puzzle,” *The New York Times*, December 21, 2014.

to Pakistan itself. In short, then, Pakistan represents the most pressing external security threat that India faces, though it is the lesser of the two major external threats that India faces.

The second major external military threat that India faces is from China. Though China represents a more serious threat because it is a much more capable military power, it is generally seen as a longer-term threat than Pakistan, an assessment that has remained unchanged for decades. Moreover, China is seen as a much more responsible state than Pakistan, making the India-China nuclear equation appear somewhat more stable and less fearsome than the India-Pakistan relationship. The Ministry of Defense identifies the key problem with China as the unresolved border dispute, “a major factor in India’s security calculus,” continuing on to say that “India remains conscious and watchful of the implications of China’s increasing military profile in our immediate and extended neighbourhood, as well as the development of strategic infrastructure by China in the border areas.”²⁶ Part of India’s worry also has to do with China’s general behavior, in particular its increasing aggressiveness as demonstrated in areas far from India such as the South China Sea. The Vice Chief of Army Staff told the Standing Committee on Defense in the Indian Parliament (in the context of questions about raising a new Army Corps for the Chinese border) that considering the way China has been behaving in the South China Sea, India needs to be fully prepared if China decides to “raise the ante and get more aggressive.”²⁷ India particularly worries about the changing military balance between the two countries as China continues its rapid military modernization. India historically had a much more technologically advanced air force because China’s People’s Liberation Army Air Force (PLAAF), though much larger, was based on reverse-engineered 1950s Soviet combat jets. This is no longer true, as the PLAAFs modernization proceeds

apace and China’s technological capacity to build advanced platforms increases, while India’s combat squadron strength has fallen to 35, well below the 42 that it has been sanctioned and the 45 the IAF believes it needs. Yet another worry for India is the state of infrastructure on the India-China border, where there has been dramatic improvement on the Chinese side but very little on the Indian side.

The fact that Pakistan and China have a long-standing but tacit military partnership is a further problem for India. The Sino-Pakistan relationship clearly includes a strong military and strategic component that includes Chinese diplomatic support for Pakistan on a variety of India-Pakistan issues including on Kashmir, terrorism, and nuclear rules and regimes. China’s support includes direct military sales as well as technology collaboration and transfers. China has also provided Pakistan with nuclear weapons technology, specifically nuclear warhead design, signifying a relationship that is unprecedented in the history of nuclear weapons development. Such close collaboration has led Indian officials recently to begin even considering the possibility that the two countries might collaborate in active hostilities leading to India facing the possibility of a two-front war.²⁸

India’s Defense Doctrine and Strategic Response

India does not produce any official strategy document that describes how it plans to deal with the threats that it faces. It did produce a brief statement in 2003 about India’s nuclear doctrine and various military services have produced their own military doctrinal statements but these do not appear to form a coherent whole in terms of strategy. Nevertheless, some outlines of strategy can be discerned. On internal security, India is likely to continue with existing policy. With both Pakistan and China, Indian strate-

²⁶ Ministry of Defense, *Annual Report 2014–2015* (New Delhi: Government of India, 2015), p. 6.

²⁷ Standing Committee on Defense, 16th Lok Sabha, *Seventh Report: Demands for Grants (2015–16): Army* (New Delhi, April 2015), 23. Note that the name of the country is redacted in the document but there can be little doubt that it refers to China both because of the reference to the South China Sea and because the issue under discussion related to the raising of a new Army Corps for the border with China.

²⁸ “NSA Ajit Doval: India Must Prepare for a Two-front War,” *Hindustan Times*, November 25, 2014.

gic response includes elements of diplomacy as well as military means.

Internal Security

Despite some problems, India's response to domestic insurgencies have been successful and India will likely continue its existing policies. This includes some military pressure where warranted but also substantial focus on political and economic policies that work to reduce the underlying causes of rebellions to "restore normalcy." India's strategy is based on the understanding that there are no military solutions to domestic rebellions and what is required is political compromise (which includes almost anything short of actual secession) and patience. India has tweaked this strategy (raising new types of military forces for example) but it is overall unlikely to change.

Pakistan

On Pakistan and the terrorism challenge, diplomatically, India has had a fairly easy case to make because, as stated earlier, there has been little doubt about the complicity of the Pakistani state in these attacks. But while India has the world's support and sympathy as the victim, this has not been particularly beneficial because there is little by way of direct sanctioning of Pakistan's behavior by the international community. In particular, Pakistan has been able to leverage American geostrategic needs of the Afghan war in order to escape any serious consequence. More importantly, international approbation has not induced Pakistan—or at least those elements engaging in such behavior, the Pakistan Army and the Inter-Service Intelligence (ISI)—to change its behavior. India has also repeatedly tried to negotiate its differences with Pakistan but this has not been successful.

If India has not found much satisfaction with diplomacy, it has not fared much better with military means either. India has not been able to develop an appropriate military response to Pakistan's combi-

nation of state support for terrorism and the threat of nuclear escalation. Since 1998, India has considered at least two different military responses to this quandry. In the immediate aftermath of the Kargil war, Indian leaders—including both Defense Minister George Fernandes and Army Chief General V.P. Malik—argued that despite nuclearization, there was sufficient space below the nuclear threshold for India to fight a conventional war. This suggested that India will not let the threat of nuclear escalation constrain it from bringing its military force to bear on Pakistan. Still, such statements were not followed up by any indication of actual military planning or preparation. They were, in all likelihood, attempts at deterrence through bluff.

A more serious innovation came as a consequence of the military mobilization crisis caused by a Pakistani terrorist attack on the Indian parliament. The Indian army proposed what came to be dubbed the "Cold Start" doctrine that suggested a rapid military attack as a response to terrorist outrages. Such attacks would be broad, across many sectors of the border, thus preventing Pakistan from concentrating its defenses, but also shallow, as a way of capturing limited amount of Pakistani territory so as not to cross Pakistan's nuclear threshold. It would also employ already deployed military units to begin the assault so that any assault could be launched rapidly, before Pakistan had a chance to mobilize and before the international community had any chance to step in to save Pakistan. India conducted a number of military exercises especially in order to test jointness between the air force and the army in conducting such military operations. But it was never clear that this doctrine had the needed political support. In any case, the doctrine led to significant international concerns about the possibility of nuclear escalation and the Indian government has formally disavowed it.²⁹ Pakistan has sought to further complicate Indian calculations by developing tactical nuclear weapons (TNWs), which lowers the nuclear threshold. India has not come up with a response to Pakistan's move to introduce TNWs, though there has been a significant debate in the Indian strategic

²⁹ Manu Pubby, "No 'Cold Start' doctrine, India tells US," *Indian Express*, September 9, 2010.

community about how to respond to it. Overall then, India's strategy is broadly reactive and defensive, with diplomacy playing an important role. It should be, however, noted that over the last few months, India has responded much more robustly to Pakistan's alleged terrorist provocations, including by conducting what New Delhi characterized as a "surgical strike" on terrorists within Pakistan-controlled territory. Whether this represents a new paradigm in Indian policy remains to be seen.

China

To deal with any threat from China, on the diplomatic side, India has sought to build strategic relationships with many of the other countries in the Asia-Pacific region that also feel pressured by China's recent behavior. India has built a significant strategic relationship with the United States, which includes military exercises and arms transfers, and India has also sought to build much closer strategic ties to others such as Japan, Australia, Singapore, Taiwan, and Vietnam. This is radically new for India, which through the Cold War shunned Asian states that were tied to US military alliance structures in the region. India has also become much more vocal about the South China Sea problem and the threat to freedom of navigation in the region, with Prime Minister Modi himself stating at the recent East Asia Summit that "India hopes that all parties to the disputes in the South China Sea will abide by the Declaration on the Conduct on South China Sea and the guidelines on the implementation."³⁰ These new relationships do not yet represent military alliances but they are a form of "soft-balancing" China, which has the potential to become a hard-balancing alliance relationship should the strategic situation worsen further in the future. Still, it is difficult to see any significant military alliance against China developing among Asian powers, for the simple reason that they are each much weaker than China, and both history (Japan's imperial past) and geogra-

phy (the distance separating key alliance partners) will constrain any such alliance. If any such alliance is to develop, it will have to depend on the United States to anchor it. Considering the increasing sense of isolationism within the U.S. political culture, this approach does face some challenges.

Militarily, India's strategy appears to be a defensive one that is primarily focused on holding what it already has than in attempting to recapture territory that it claims that China occupies. This defensive strategy, or "defense by denial," is based on both deterring China from attacking and, should deterrence fail, defeating any Chinese attack. India is attempting to strengthen its defenses along the Chinese border, especially in terms of upgrading India's rather poor border infrastructure. India deploys about a dozen light mountain divisions for the Chinese border, though some of them also double as counterinsurgency forces. India has plans to raise a new strike corps for the Chinese border, the 17 Corps, which will be India's first mountain strike corps. The enormous cost of raising this had led to some comments by the Indian Defense Minister about rethinking this initiative, but it does appear that the formation of the 17 Corps is proceeding and it will be fully functional by 2021.³¹ The Indian Air Force is also strengthening its capabilities, deploying two SU-30 MKI squadrons, the most advanced combat planes in the IAF, to the region.

Nuclear Weapons and Indian Strategy

India has been a reluctant nuclear power, unwilling to go down the nuclear path until its hands were forced by Pakistan's nuclear developments in the 1980s. Though India's original nuclear weaponization program was a response to Pakistan's nuclear weapons program, after becoming an overt nuclear power in 1998, India has started paying much more attention to China, developing long-range missiles that will be able to target all of China. India's capabilities are

³⁰ Ministry of External Affairs, "Remarks by the Prime Minister at the 10th East Asia Summit in Kuala Lumpur (November 22, 2015), http://www.mea.gov.in/Speeches-Statements.htm?dtl/26053/Remarks_by_Prime_Minister_at_the_10th_East_Asia_Summit_in_Kuala_Lumpur_November_22_2015.

³¹ Sushant Singh, "War game quells doubts on new corps," *Indian Express*, February 8, 2016.

still inadequate because it still does not have missiles or other strategic delivery capabilities with sufficient range to target all of China from southern India. Similarly, though India has begun work on the sea-based leg of its triad, it is a long way from acquiring a true sea-based deterrent. India has, as of yet, only one missile submarine, and its missiles do not have the range to target China from the Bay of Bengal. Thus India can be expected to continue to develop its capabilities for at least a couple of decades more. On the other hand, these increases in capabilities should not suggest a rapid increase in the size of the arsenal: India's warhead count has grown very slowly, at the rate of about three to four per year, and there is nothing to indicate that this momentum will accelerate.

Nevertheless, nuclear weapons play only a very limited role in India's military strategy. India has essentially viewed nuclear weapons as political weapons rather than militarily useful tools. In other words, India's focus is on deterrence rather than war-fighting with its nuclear weapons. India sees little direct military utility in nuclear weapons other than in preventing a nuclear attack on itself, an attitude that is very similar to China but somewhat different from that of Pakistan. This is an attitude that grew out of Indian criticisms of the nuclear arms race between the United States and the Soviet Union during the Cold War, but it provides India significant advantages too. India's nuclear strategy can be broadly characterized as "assured retaliation," which seeks to use nuclear weapons purely for retaliation and hence emphasizes minimal, credible and survivable nuclear forces. This strategic and political view of nuclear weapons is one reason why India has not considered additional roles for nuclear weapons and why India has not responded to Pakistan's development of TNWs or responded to the pace of Pakistan's nuclear warhead development.

India has a declared nuclear doctrine, which was first outlined by the semi-official National Security Advisory Board (NSAB) in August 1999. This was not formally accepted by the government as its nuclear doctrine, though many key elements of the NSAB's doctrine stuck to policy elements that the government

had declared officially both in parliament and outside after the 1998 nuclear tests. The official doctrine, or at least some key points from it, were released in January 2003 as a press statement. This official doctrine reiterated the key points from the NSAB's nuclear doctrine, but also added additional—and somewhat controversial—elements to it. The central element of the Indian doctrine is the No First Use (NFU) pledge. The NFU is controversial and there has been significant opposition to it among a vocal minority in the Indian strategic community. Still, there is little indication that the Indian government will consider changing it. Indeed, though the 2014 Bharatiya Janata Party (BJP) Election Manifesto promised to revise and update the nuclear doctrine, BJP leaders quickly disclaimed any intention to change NFU and despite winning the election, have not made any move to change the doctrine.

The Indian doctrine also emphasizes civilian control over nuclear weapons, which is by definition risk-resistant. India also employs a relatively relaxed command and control arrangement, with weapons held in a de-alerted and de-mated posture, which increases both the safety and the security of these weapons. In addition, despite not being a party to the NPT, India continues its unblemished record on nuclear non-proliferation and has reiterated a continued commitment to nuclear disarmament.

Conclusion

India's security environment continues to be challenging, with India facing threats ranging from domestic insurgencies to Pakistan-sponsored terrorism and all the way to full-scale conventional war threats from both Pakistan and China. India's response to these threats are varied but it is largely reactive and defensive, with diplomacy playing an important role in both countering some threats and in enhancing Indian capacities through strategic partnerships. Nuclear weapons play a very limited role, which is in deterring the threat from other nuclear weapons. Though India's strategic environment is getting more challenging, its responses are likely to remain stable and it is unlikely to shift radically.

Annex C. Security Environment: Pakistan's Perspective

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Introduction

The world in the 21st century has become more complex, interdependent, and dynamic than ever before. The rapid advancement of computer, communication, space, and other technologies is creating new opportunities and challenges for our individual and collective wealth, security, and identities. Therefore, in order to ensure global and regional security, stability, and progress, constant multilateral and multi-dimensional efforts are vital to resolve disputes and build mutual convergences between States.

Today, the shifting balance of economic power from the West to the East invokes both hopes and fears, and challenges the traditional ways of preserving our individual and collective national wealth, security, identities, relations, and environment. Unfortunately, during the last three centuries, the nature of relations and approach towards statecraft between the developed and developing nations have generated more apprehension than hope.

The 21st century presents an unprecedented, interdependent environment to the entire world to gradually and collectively evolve a fair, equitable, and transparent paradigm, which enables all nations to mutually benefit by peaceful and negotiated settlement of disputes, mutual cooperation, and fair sharing of wealth, resources, and opportunities. This approach alone will lead to equal and undiminished security for all. The growing threat of global and transnational terrorism is in some ways a consequence of ignoring this international security imperative and our collective and national obligations.

Pakistan's security environment is shaped by a combination of political, economic, diplomatic, technological, and military trends, events and actors at the global, regional, and national levels. This paper assesses the complex traditional and non-traditional

security challenges and the role Pakistan's nuclear deterrent plays in coping with these at the global and regional levels.

Global Security Environment

Despite the stresses of an anarchical structure, the world is drifting towards interdependence amid regression in economic growth, spiking military spending, growing defense industries, and advancing capabilities to wage wars. This complex admixture indicates that while the world is economically and culturally getting more and more interconnected and interdependent, major global and regional powers continue to qualitatively and quantitatively enhance their individual military capabilities. This enhances their relative hard and coercive powers, reduces the prospects of global arms control, and threatens international and regional peace.

According to the latest Stockholm International Peace Research Institute (SIPRI) estimates, the American share of the world's total defense spending is approximately 40 percent, while Asia has overtaken Europe by spending almost 25 percent of the world's total military spending, in contrast to roughly 22 percent by Europe. This trend is likely to continue with the visible shift in the world's economic and industrial base from the Atlantic towards the Asia-Pacific region. The shifting sands have led various major Western powers to reorient and deploy their military and strategic capabilities more towards the Asia-Pacific and less towards other regions. Not only it has created new divergences between the existing and rising major powers but also put major international institutions and alliances under new stresses, constraining their ability to develop consensus or make any substantial progress towards conflict resolution, arms control, and disarmament.

Some of the rising regional powers are spending more of their wealth towards building and advancing their conventional and strategic forces. In 1998, Indian defense spending was four times that of Pakistan while today, despite the introduction of nuclear deterrence, New Delhi spends approximately seven

times more on its military than Islamabad. This growing economic and conventional asymmetry, amidst the inability of the international community and international institutions to peacefully resolve disputes between Pakistan and India, compels Pakistan to increasingly rely on its nuclear deterrent as a cost-effective factor of stability and a durable instrument of peace in the subcontinent.

Furthermore, the world's existing, emerging, and resurgent powers, without any direct conflict with each other for decades, have continued to maintain, deploy, and improve the size, alert levels, accuracy, effectiveness, and lethality of their nuclear arsenals. Fast-paced technological advancements in both kinetic and non-kinetic domains are rapidly eroding the traditional distinction between war and peace. Development of new, more numerous, accurate, destructive, and long-range ballistic missiles, ballistic missile defense systems, hypersonic cruise missiles, ballistic missile nuclear submarines, mating of warheads with diverse delivery systems into a ready-arsenal, higher alert levels, space militarization and weaponization, and deployment of the latest generation of fighters and bombers is underway in various states.

In addition, the evolution of armed and stealth drones and robots, improving non-kinetic capabilities, particularly the prospect of cyber warfare, have transformed both the international security canvas as well as modern warfare in a manner that achieving strategic stability appears distant for the global south. These trends provide states possessing a high-tech defense industry and growing economies with significant strategic advantages, making the maintenance of balance of power between industrialized nations and developing nations increasingly difficult.

Such destabilizing trends have been further exacerbated by the regional geopolitical and geostrategic preferences of major industrialized nations to monopolize the knowledge economy, modernize, and rapidly build up their new allies against the rising powers. These vicissitudes of the international system have exacerbated the power imbalance, raised the political cost of diplomacy, weakened forums

like the Conference on Disarmament, foiled various strategic and nuclear confidence building measures, and made conflict resolution less likely. Within South Asia, these global trends have negatively affected the regional balance of power, threatened strategic stability, and reduced the prospects of conflict resolution.

Pakistan's Regional Threat Perception

By virtue of its unique geography, size, history, demography, and economy, Pakistan offers immense opportunities to make a substantive contribution towards regional progress and global prosperity. In 1971, Pakistan played the pivotal role in bringing the United States and China close to each other. Forty-five years later, Pakistan firmly believes that the Asian economic resurgence offers immense opportunities, which can mutually benefit not only South Asia but also Asia at large. Such a regional effort can build interdependence between America and China through peaceful cooperation for collective and common gains. Pakistan is convinced that the net gain of conflict resolution and international cooperation will far outweigh any perceived or actual gains, which may or may not arise out of an alternative investment in hard power and coercive capabilities. Such an effort will invariably impact positively on South Asian strategic stability and provide lasting benefits to the "strategic chain."

The identity of both nations is historically constructed but besides history and geography, economy also poses profound challenges to the contemporary South Asian security architecture. Despite its commitment to the U.N., Kashmiri people, and the international community in 1948, the Indian reluctance to hold a plebiscite in Kashmir; the forced separation of East Pakistan as a direct consequence of New Delhi's military intervention and active support for the Bengali insurgency, and Indian military occupation of Siachen glacier are deeply rooted in Pakistani national psyche. The Indian Army's large scale *Brasstacks* exercise during the 1980s and the extended military stand-off of 2001-2002 indicate that geographical contiguity makes crises more frequent

and escalation more likely in South Asia whenever there is a large Indian military deployment or exercise near the Pakistan-India border. However, for Pakistan, its robust nuclear deterrent has worked and helped in the management of various crises. Moreover, the Indian economic rise has not only exacerbated the traditional conventional asymmetry; it has also increased the political cost of conflict resolution and made New Delhi less willing to negotiate with Pakistan as a sovereign equal. Politically, in the absence of a meaningful, result-oriented, and sustainable dialogue aimed at a peaceful conflict resolution between India and Pakistan, U.S. support for Indian permanent membership in the U.N. Security Council, the growing strategic partnership between India and the United States, exceptional and without-criteria advanced military and technological cooperation, and access to New Delhi, is a matter of grave security concern for Pakistan and a serious, destabilizing trend in South Asia.

The notion that a growing Indian military might help the United States counter-balance China is not supported by empirical evidence and ground realities. The type, nature, location, and size of most conventional and strategic capabilities that India is swiftly acquiring, developing, and inducting are overwhelmingly poised against Pakistan. According to an assessment, during the last 12 years, India has spent over \$185 billion on weapons, infrastructure, installations, and capabilities, most of which are arrayed against Pakistan. The posture of Indian offensive and defensive conventional and strategic forces as well as their training, exercises, stationing, and deployment pattern is also increasingly Pakistan-specific.

The Indian Cold Start Doctrine aims to rapidly launch shallow thrusts inside Pakistani territory in order to capture it and use it for pressurizing Pakistan into accepting New Delhi's demands, before the international community could defuse the conflict. The Indian emphasis is on speed and mobility in order to prevent both Pakistan and the international community from defusing the crisis and using it as a strategic opportunity. The large-scale Indian development and exponential growth of highly mobile

armored, mechanized, and artillery formations and rapid airlift capabilities—which are far more suitable to operate in an environment, climate, and conditions associated with Pakistan than China—provide compelling evidences of the operationalization of the Cold Start Doctrine.

As a result, Pakistan has developed Full Spectrum Deterrence in order to ensure that India is deterred from imposing a limited conventional war on Pakistan, under New Delhi's dangerous perception of a possible Pakistani nuclear threshold. Full Spectrum Deterrence is based on developing a variety of nuclear weapons of different types and ranges to credibly deter all possible types, scale, and ranges of threats, which Pakistan perceives from the growing Indian conventional and strategic capabilities. So far it seems to have worked and played a positive role in furthering strategic stability in South Asia—and, by extension, in the strategic chain.

India has the largest, oldest, and fastest growing unsafeguarded nuclear program of all non-NPT states. According to George Perkovich's famous book *India's Nuclear Bomb: The Impact on Global Proliferation*, India started its nuclear program much before its independence, with Dr. Homi Jehangir Bhabha's efforts and private funding. India successfully achieved its nuclear weapon capability much before Pakistan by separating plutonium from its Phoenix reprocessing plant even before the 1965 Indo-Pakistan War. New Delhi carried out its nuclear tests in 1974 and 1998 without any provocation, prevailing crisis, conflict escalation, or direct threat from either China or Pakistan. Both its unsafeguarded plutonium production and highly enriched uranium programs are exponentially much larger than not only Pakistan's but all the non-NPT states'. Despite developing long-range nuclear delivery vehicles, the oldest, most advanced, accurate, and operationally ready Indian missiles are those that can be employed against Pakistan more effectively than against China.

In addition, Indian Defense Minister Manohar Parrikar has openly supported waging sub-conventional warfare against Pakistan. Former U.S. Secretary of

Defense Chuck Hagel has also expressed concern at the Indian involvement inside Pakistan. Numerous Pakistani officials and military officers have repeatedly stated that India is actively supporting terrorist and insurgent movements in different areas of Pakistan. Some Pakistani analysts also find it peculiar that some significant terrorist incidents inside India or its held territories tend to occur whenever there is a high-level engagement between Pakistan and India, aimed at resuming the Composite Dialogue process and improving mutual ties in recent years. Such incidents allow India to blame Pakistan and are obviously not in the interest of Pakistan. These incidents only harm the prospects of resumption of a sustainable, substantive, and result-oriented dialogue, which is Pakistan's longstanding core demand, particularly on the Kashmir issue. Therefore, terrorist incidents inside India are not in Pakistan's national interest. That is why Pakistan has provided significant cooperation to India in investigating the Pathankot incident. The United States also appreciated this cooperation in the recent U.S.-Pakistan Strategic Dialogue. Furthermore, the growing Indian security role within Afghanistan and New Delhi's expanding military cooperation with Iran, Central Asia, and Saudi Arabia, as well as nuclearization of the Indian Ocean are also causes of increasing concern for Pakistan.

Another development, which could radically transform the contemporary Asian security dynamic, is the rapidly growing economic interdependence between China and India. In the future, India and China, the world's two most populous neighbors, are expected to form one of the world's biggest bilateral trade relations. Even at the current level, the Indo-Chinese bilateral trade volume is worth far more than what New Delhi annually spends on its defense. This indicates that the Sino-Indian mutual stake in geoeconomic cooperation will gradually outgrow their limited geopolitical and geostrategic divergences. A large, wealthy, and powerful India will be less likely to subordinate its own regional geoeconomic interests to the U.S. global geostrate-

gic interests. These facts represent an Indian behavior, commensurate with a rising global power, which aspires for a worldwide role in its own right, rather than that of a developing country, willing to follow a superpower's diktats. Based on the longstanding aspirations of its political elite, growing economy, and huge military build-up, India seems determined to become an anti-status quo power at the global level.

In addition, the de-hyphenation of South Asia by the U.S. military into Central and Pacific Commands has further accentuated the regional security challenges for South Asia. Washington expects India to play a greater strategic role within the Pacific Command's area of responsibility and expects Pakistan to orient its security considerations more towards Afghanistan and Middle East. This U.S. expectation, in contrast to the regional, historic, geographical and strategic realities, is harmful to the maintenance of strategic stability and durable peace and security in South Asia. This unnatural U.S. de-hyphenation of South Asia into Central and Pacific Commands further reduces the prospects of arms control and disarmament at the global and particularly at the regional level.

Pakistan's Defense Doctrine

Pakistan faces five major types of security threats from India. First, the threat of a limited conventional war. Second, the threat of low-intensity conflict and state-sponsored terrorism to destabilize it internally. Third, the threat of a nuclear war. Fourth, attempts to harm Pakistan's water and economic security. Fifth, cyber- and space-based threats. Pakistan's nuclear deterrent plays a pivotal role in guarding Pakistan's national security interests in multiple dimensions. In order to dissuade, deter, and defeat these threats Pakistan has taken various elaborate measures by developing and employing the full spectrum of military capabilities in a network centric environment.³²

The National Command Authority (NCA) statement issued after its sixteenth meeting held on Janu-

³² ISPR, Press Release, PR 193/2010-ISPR dated May 14, 2010.

ary 10, 2010, mentioned that “*The NCA took serious note of recent Indian statements about its capability to conduct conventional military strikes under a nuclear umbrella.*”³³ Pakistan has planned to deal with the threat of limited conventional war with a combination of both conventional and strategic measures. Pakistan conducted the *Azm-e-Nau* series of military exercises, which enabled it to develop a comprehensive and integrated response to emerging threat scenarios,³⁴ perhaps primarily referring to the Indian Cold Start Doctrine. According to Pakistan’s Inter Services Public Relations (ISPR), these exercises, spread over four years, involved various corps, and aimed to review and validate operational plans in accordance with the threat spectrum.³⁵ *Azm-e-Nau* exercises allowed the Pakistani Army to improve its mobilization time and put into practice a new concept of war fighting against full spectrum of threat, be it direct or indirect, and overt and covert.³⁶

The introduction of the *Nasr* short-range ballistic missile through its first test on April 19, 2011 also coincides with the timeframe during which these exercises were held. This indicates that Pakistan’s defense doctrine is based on an integrated and comprehensive concept in which both conventional and nuclear weapons have their specific but synergized roles, to cater to different scenarios, nature, type, and extent of threats. Therefore, Pakistan’s defense doctrine should not be understood in terms of merely conventional capabilities or the deterrence role of its nuclear capabilities alone, since both capabilities are available in synergy and coordination, to the national leadership for appropriate employment, in accordance with the situation, nature, type, and extent of threat to the country’s national security. Which specific weapon or capability Pakistan will employ in a given operational scenario depends upon the particular situation and the level of threat to its national security. However, a full spectrum of diverse conven-

tional and strategic capabilities is available to the Pakistani national leadership to choose from, in order to protect national security during peace, crises, or conflict, provide national leadership diverse range of strategic options, and make other states factor in all these capabilities and options, available to Pakistan to protect its national security. In a conversation at the Carnegie International Nuclear Policy Conference 2015, Advisor NCA Lt. General (Ret.) Khalid Ahmed Kidwai confirmed this view in his statement that “[n]uclear strategy integrates the land operations of the conventional forces.... So it is one integrated whole.”

Pakistan is currently engaged in a large-scale and active military operation known as *Zarb-e-Azb*, against terrorists. The arrest of Indian Navy Commander Kulbhushan Yadav from Baluchistan gives serious credence to Pakistan’s insistence the Indian intelligence Agency RAW is involved in destabilizing Pakistan and the multi-billion-dollar China-Pakistan Economic Corridor.³⁷ Pakistani Army and Air Force’s current commitments towards the ongoing unprecedented counter-terrorism operation further enhances the role of the nuclear deterrent in ensuring that peace prevails on the borders.³⁸

Since Pakistan’s Strategic Doctrine aims only at deterring Indian aggression, therefore, it has developed nuclear delivery systems of diverse ranges to meet threats in all spectrums. *Shaheen III*, with a range of 2,750 km, ensures that no part of Indian territory, including its most distant islands, is outside the reach of Pakistan’s nuclear weapons, whereas at the shortest range *SRBM Nasr* forecloses the Indian option of imposing a limited conventional war upon Pakistan by commencing operations at the tactical level within 72 to 96 hours, as per the Cold Start Doctrine. Besides these two delivery systems, which represent the two extremes of Full Spectrum Deterrence, there are various additional strategic deliv-

³³ ISPR, Press Release, PR 11/2010-ISPR dated January 13, 2010.

³⁴ ISPR, Press Release, PR 63/2010-ISPR dated February 10, 2010.

³⁵ ISPR, Press Release, PR 196/2012-ISPR dated September 12, 2012.

³⁶ ISPR, Press Release, PR2/2013 –ISPR dated January 8, 2013.

³⁷ Syed Ali Shah, “RAW involved in destabilizing Pakistan, says General Raheel,” *Dawn*, April 12, 2016.

³⁸ Michael Krepon, “The Limits of Influence: US-Pakistani Nuclear Relations,” *The Non-Proliferation Review* 18, no. 1 (March 2011): p. 95.

ery systems in between, including surface and air launched cruise missiles, to ensure that Pakistan is ready to deter the entire spectrum of threats. Pakistan possesses a credible but minimum deterrence in the form of both high and low yield, short and long-range nuclear weapons, capable of penetrating all known types of active and passive missile defenses. In the same conversation with Dr. Peter Lavoy at Carnegie, Lt. General (Ret.) Kidwai unequivocally stated that there is no need for Pakistan to develop longer ranged nuclear delivery systems.³⁹ This unambiguous statement reflects that Pakistan's solitary strategic objective is to maintain strategic stability in South Asia and it does not have any extra-regional strategic ambitions. It is also evidence of Islamabad's consistent policy of nuclear responsibility and restraint. Pakistan has a consistent policy of ambiguity regarding the size, nature, and location of its nuclear arsenals, which, according to Lt. General (Ret.) Kidwai, is unlikely to be altered by any government.

Besides the risks associated with conventional, sub-conventional, and nuclear conflicts, new threats of complex dimensions are emerging in the region, which makes Pakistan-India relations more conflict-prone. Pakistan is a water-stressed agricultural country whose economic, human, and energy security are heavily dependent upon the regular and substantial availability of water from rivers, which flow from Indian-occupied Kashmir, Indian Punjab, and Afghanistan. India has been consistently building large number of projects and dams on rivers flowing into Pakistan, in violation of the Indus Water Treaty. More recently, New Delhi also helped Afghanistan build a dam. These projects pose increasing challenges to Pakistan, which, being the lower riparian state has internationally recognized rights over regular and substantial water supply. Pakistan, with its growing economy, population, and improving lifestyle, is finding it increasingly difficult to meet its human, economic, agricultural, and energy needs. In the future, in the absence of timely, equitable, and lasting resolution of the growing water dispute, the possibility of conflict between Pakistan

and India on this account alone cannot be ruled out. India is also developing a large cyber force, which can also have an offensive role. This could introduce a new dimension of threat and a greater challenge to strategic stability in South Asia, which merits timely consideration of substantive measures to prevent escalation during crises and conflicts.

In 1998, after the nuclear tests by New Delhi and Islamabad, Pakistan's strategic planners hoped that nuclear weapons would not only make wars between the two neighbors less likely, but instill a greater realization in both states of the urgent need to resolve disputes—which cause not only crises and conflicts, but have also led to the introduction of nuclear weapons. Unfortunately, this has not happened. The strategic dialogue has been repeatedly stalled by India on various pretexts, which makes strategic stability tenuous.

Nuclear Weapons: Rationale, Role, and Purpose

The purpose of Pakistan's nuclear program is to deter all forms of external aggression in order to promote regional peace and contribute towards national progress and prosperity. Pakistan was not the first in South Asia to develop, introduce, or test nuclear weapons. Since its inception in the early 1950s, under the Atoms for Peace program, Pakistan's nuclear program was completely peaceful for almost two decades, and it also proposed a nuclear weapons free zone in South Asia. However, in the absence of a positive and reciprocal response from India, which had already developed nuclear weapons by using U.S.-supplied heavy water from a Canadian reactor, Pakistan was compelled to follow suit. Islamabad's decision to develop a nuclear deterrent was entirely driven by its own security compulsions, in the absence of any international security guarantees and in order to ensure its own survival and national security, particularly after 1971, when it became a victim of a direct military aggression by its large eastern neighbor in erstwhile East Pakistan. The need for interna-

³⁹ "A Conversation with Gen. Khalid Kidwai," Carnegie Endowment for International Peace, March 23, 2015

tional guarantees has been overtaken by history. The reality of the anarchical global system exposed the failure of international institutions, community, and treaties to protect Pakistan's national security, territorial integrity, and sovereignty. Islamabad naturally responded by developing an indigenous nuclear deterrent to prevent any such future eventuality.

Among all nuclear-armed neighboring states, the conventional asymmetry between India and Pakistan is the more pronounced. The size, nature, configuration, capabilities, location, and behavior of Indian conventional forces represent a real and present danger to Pakistan's national security.

The economic asymmetry at the regional level between nuclear-armed India and Pakistan is greater than the asymmetry between the United States and China or China vis-à-vis India. Therefore, engaging in an arms race is neither feasible nor desirable for Pakistan. Islamabad believes in credibly meeting its national security needs through minimal use of its resources and does not seek revision of global order. Pakistan's sole national security purpose is to protect its people, territory, wealth, and independence. Nuclear deterrence plays a key role in complementing this national security imperative. Pakistan's nuclear program represents a sacred national trust and enjoys a deep national consensus. It represents Pakistan's collective national resolve to safeguard and protect its territory, population, resources, and independence against external threats, at all costs.

Since 9/11, Pakistan's fifteen years-long engagement in counterterrorism operations and large military deployments on its western borders has affected and accentuated the conventional asymmetry between Pakistan and India on the eastern borders. As a result, the role of the nuclear deterrent has become more pronounced in crisis prevention and conflict management in South Asia than ever before. Furthermore, considering the cumulative impact of India's pre-emptive Cold Start Doctrine, the evolution of a large blue water navy, armed with aircraft carriers, ballistic missiles, and nuclear attack submarines, the development of 13 different types of nuclear

capable missiles of varying ranges, development of Ballistic Missile Defense, are strategic developments no policy planner, strategic thinker, or decision maker in Pakistan can afford to ignore.

Indian doctrinal and force posture developments continually vitiate the threat spectrum for Pakistan. Consequently, Pakistan maintains its longstanding principle of credible minimum deterrence, and through full-spectrum deterrence, adjusts to the dynamics of threats. Such policy and posture ensures that no part of Indian territory or military, either close or far, remains invulnerable to Pakistan's nuclear weapons. India's developing ballistic missile defense system is dangerous and destabilizing not because it can reduce the credibility of Pakistan's nuclear deterrent but because it can give the Indian leadership a false sense of security. This misplaced confidence could be very dangerous in a nuclearized South Asia and could encourage the Indian leadership to take the dangerous and incorrect decision of testing our resolve by attempting a swift and limited attack on Pakistan from land, sea, or air.

It is worth noting that Pakistan's nuclear delivery systems are diverse, highly accurate, very sophisticated, and fully capable of defeating and penetrating all known forms of active and passive missile defense systems. Any attempt to test the credibility of Pakistan's nuclear deterrent could risk large-scale destruction in South Asia, whose effects will be global.

While Pakistan has developed multiple types of nuclear warheads and delivery means of different weight, size, and ranges—which can be launched from land, air, or sea—Pakistan ensures the credibility of its deterrence by maintaining opacity about the targeting and alert status of its nuclear weapons. Presumably, Pakistan's targeting policy would be guided by considerations such as the type, nature, location, and size of threat and desired physical and psychological effects. Likewise, Pakistan's decisions regarding the size of arsenal and yields of warheads are also expected to be based on rational strategic considerations, and not by a desire to engage in an arms race. The public assessments about the latter

two aspects are at best estimates that appear politically motivated.

The myth that Pakistan has the largest growing fissile material program seems aimed at attempting to divert international attention from the reality of the world's largest, oldest unsafeguarded nuclear program among all the non-NPT states that India possesses, which it is rapidly expanding and advancing with active help from a dozen other states, including the United States.

Pakistan's robust command, control, and communication architecture is balanced to overcome the tensions of the always-never dilemma, which is designed to ensure that nuclear weapons are always available once needed and are never used inadvertently or when not authorized. Various effective nuclear command and control measures ensure positive and negative controls over all types of nuclear warheads, at all times. Compared to the huge size of the nuclear arsenals of major powers that have been developed over the past six or seven decades, Pakistan's nuclear arsenal is relatively modest in quantitative terms, but qualitatively modern and sophisticated.

Nevertheless, despite its relatively smaller size, Pakistan's nuclear arsenal is reported to be widely dispersed in numerous secure and secret locations, across the country. Pakistan's nuclear arsenal is probably one of the most well-guarded, and is constantly secured by one of the world's largest nuclear security apparatuses, consisting of a highly trained, motivated, and specialized force, deployed in accordance with an elaborate, multi-layered, defense in depth concept.

Pakistan strictly adheres to the ideals of equitable arms control and non-proliferation and actively engages with the international community to promote nuclear security and improve international best practices. It has developed an extensive and fool-proof personnel reliability program, to guard against all forms of insider threats. This system is constantly reviewed for improved quality and greater vigilance.

Conclusion

Pakistan is a rational, peace-loving, moderate, democratically-led, developing nation. Islamabad was compelled to develop nuclear weapons to ensure Pakistan's security. The sole purpose of its nuclear deterrent is to deter aggression and maintain peace, security, and strategic stability within South Asia and prevent any form of regional conflict.

Global factors—such as the growing divergences between the interests of major powers, reduced role of international institutions and community in conflict resolution, constant improvements in nuclear weaponry, and reduced prospects of disarmament—indicate that nuclear weapons will continue to play an important role in international security in the foreseeable future.

Regionally, the growing U.S-Indian strategic partnership, increasing conventional asymmetry between India and Pakistan, rapid modernization of Indian conventional and nuclear forces, evolution of aggressive doctrines, and induction of offensive and destabilizing weapon systems—both of which seem Pakistan-specific—reflect long-term emerging trends. Over time, these destabilizing regional trends, in contrast to the hopes of strategic restraint which Indian and Pakistani nuclear tests had temporarily raised, have actually increased the vital role of Pakistan's nuclear deterrent, as a cost-effective factor of stability, perhaps more than ever before. Nonetheless, due to multiple international, regional, and domestic factors and considerations—and despite evolving a credible and dynamic Full Spectrum Deterrence strategy to cater to changes in its threat matrix—it is unlikely that Pakistan will depart from its longstanding posture of credible minimum deterrence, which is not only regionally sufficient but is also nationally affordable.

Pakistan's deterrent capability also makes peace more durable and conflict less likely in the increasingly insecure South Asia and amidst an international security environment, which seem increasingly complex, dynamic, and uncertain. Perhaps, this is the reason

why major powers, despite their lack of engagement in any large, inter-state conflict, directly threatening their national security, for over quarter of a century and growing economic constraints, continue to maintain and improve their nuclear arsenals. Almost 30 NPT non-nuclear weapons signatory states in both Europe and Asia continue to depend on nuclear weapons for their national security without physically possessing, owning, or developing them. Their national NPT obligations do not reduce their ability to benefit from the security, which the nuclear umbrellas of nuclear weapon states offer them.

In contrast, Pakistan faces clear, present, and growing regional dangers amidst a resource constrained environment, for which a nuclear deterrent offers the most cost-effective guarantee of peace, until the time the international community changes its approach towards South Asia from conflict management to conflict resolution, and Pakistan and India can peacefully and amicably resolve all of their outstanding mutual disputes in a just, equitable, and honorable manner.

Annex D. United States National Paper

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With the end of the Cold War, great power competition—and with it, issues of strategic deterrence and stability—temporarily receded into the background of international policy discussions. Increasingly, however, Asia is becoming a new locus of great power political interaction and the strategic interrelationships between the nuclear powers in this region (in particular, China, India, Pakistan, and the United States) are proving to be much more complicated than the relatively simple, bipolar nuclear order of the Cold War. In order for these nations to ensure their security and maintain strategic stability, it is important to better understand this “strategic chain” of relations between these four Asian nuclear powers. To do so effectively, however, we must first ground our discussion with a solid comprehension of the strategic environment and doctrines of each.

This paper will provide this perspective from the point of view of the United States. It addresses Washington’s security environment, its threat perceptions, its defense doctrine, and its strategy for achieving its security objectives, with a special emphasis on the role that nuclear weapons and other strategic capabilities play in promoting its interests. The paper will continue in three parts. The first section discusses the U.S. strategic environment. Second, the paper will move on to analyze U.S. strategic doctrine. Finally, it reviews Washington’s strategic policy in Asia.

Current Strategic Environment

Today, Washington’s security environment is much less benign than it was just a few short years ago. In a notable speech in Prague in 2009, U.S. President Barack Obama vowed that the United States would “seek the peace and security of a world without nuclear weapons.”⁴⁰ At the time of this statement,

the international order was stable and conditions seemed to allow for a reduction in U.S. strategic forces and an overall de-emphasis of nuclear weapons in national security strategy. Since that time, however, new threats to U.S. security have emerged.

The most troublesome of these new challenges comes from Russia, which has quickly transformed from a potential strategic partner for the West into a clear adversary. In 2014, Russia invaded Ukraine, flouting international norms and contravening past promises to uphold Ukrainian sovereignty and territorial integrity. Moscow annexed Crimea and continues to engage in military action, both directly and through proxy, in eastern Ukraine. In addition, Russia has asserted a presence in the Middle East for the first time since the end of the Cold War, intervening militarily in the Syrian civil war, where it has clashed with America’s NATO ally Turkey and has directly targeted U.S.-supported groups. These interventions are troubling in and of themselves, but also for what they might reveal about Russia’s broader strategic intentions. Many in Washington fear that Russian President Vladimir Putin may attempt a similar intervention in the Baltics, which could lead to a direct military conflict between Russia and NATO.

These interventions are also troubling from a strategic perspective because Russia has backstopped its newly assertive foreign policy with an increased emphasis on its nuclear forces.⁴¹ Throughout the crisis in Ukraine, President Putin has made explicit nuclear threats and brandished nuclear forces at levels we have not seen since the end of the Cold War. This is consistent with a Russian doctrine that has, over the past decade, moved nuclear weapons more to the center of its military and national security strategy.

Russia is supporting this nuclear-centric strategy with a modernization of all three legs of its nuclear triad. In addition, Moscow has retained an arsenal of several thousand nonstrategic nuclear weapons. Finally, Russia has violated the 1987 Intermediate-Range

⁴⁰ The White House, Office of the Press Secretary, “Remarks by President Barack Obama in Prague as Delivered,” April 5, 2009.

⁴¹ See, for example, Matthew Kroenig, “The Renewed Russian Nuclear Threat and NATO Nuclear Deterrence Posture,” Atlantic Council Issue Brief, February 2016.

Nuclear Forces Treaty (INF), the only arms control treaty in history to eliminate an entire class of nuclear weapons, by testing a new intermediate-range, ground-launched cruise missile. All of these developments have prompted a serious debate in the West about how best to respond in order to deter Russian aggression without provoking a new Cold War.

The United States also faces new challenges in East Asia. North Korea's nuclear and missile capabilities continue to expand, threatening U.S. allies in the region and potentially putting the U.S. homeland at risk. In early 2016, North Korea conducted its fourth nuclear test and outside analysts estimate that Pyongyang may have enough nuclear material for up to around 30 nuclear warheads.⁴² In addition, North Korea has expanded its missile delivery capability, testing a "satellite" in early 2016 that was widely seen as a cover for a ballistic missile test. This launch builds on a string of tests in recent years designed to help Pyongyang develop longer-range missiles, including a sea-launch capability. The head of U.S. Northern Command, Admiral William Gortney, has publicly assessed that North Korea now has the ability to miniaturize a nuclear warhead and put it on a missile capable of ranging the continental United States.⁴³

The U.S. relationship with China has also become more competitive in recent years. While Washington continues to seek a cooperative relationship with Beijing, it is also concerned about Chinese challenges to U.S. interests. Chinese cyberattacks and cyber espionage against U.S. targets have led to U.S. retaliation against Chinese entities, straining the bilateral relationship. As former U.S. national security adviser Susan Rice has said, Chinese cyberespionage is not "a mild irritation, it's an economic and national security concern to the United States."⁴⁴ China has tangled with U.S. treaty-ally Japan over the disputed Diaoyu/Senkaku islands, including a

clash in 2012, which many believe narrowly avoided escalation to military conflict. In addition, China's land reclamation project in the South China Sea appears to be a Chinese attempt to settle the status of the disputed islands by confronting other claimants with a *fait accompli*. Washington maintains that the competing claims must be resolved through negotiations, not coercion, and has conducted freedom of navigation operations to challenge China's claims of sovereignty over the islands. More broadly, China's military modernization and its Anti-Access Area Denial (A2AD) strategy and capabilities challenges the U.S. position in Asia; Washington is responding with enhancements to its own defense strategy and posture to ensure that it has the ability to defend its treaty allies in Asia.

U.S. interests in the Middle East are also threatened by renewed turmoil in the region. Beginning in 2011, the Arab uprisings unseated several long-standing governments, creating vacuums of power in key states and unleashing regional instability. At present, civil wars rage in Syria, Iraq, Yemen, and Libya. Regional powers, most notably Saudi Arabia and Iran, vie for influence in these conflicts through direct intervention and support to proxies. More troubling still for U.S. interests is ISIS, arguably the best organized and financed terror group in history, which has emerged in the ungoverned spaces of eastern Syria, western Iraq, and Libya, and has inspired terror attacks against Paris and California.

The greatest potential strategic threat in the Middle East, however, is Iran's uranium enrichment program. A nuclear-armed Iran could upset the regional balance of power and pose a direct threat to the United States and its allies and partners in the region. As President Obama has argued repeatedly, the United States will do "whatever it takes" to prevent Iran from building nuclear weapons.⁴⁵ Now that the Joint Comprehensive Plan of Action, better

⁴² David Albright and Christina Walrond, "North Korea's Estimated Stocks of Plutonium and Weapon-Grade Uranium," Institute for Science and International Security (ISIS), 2012, http://isis-online.org/uploads/isis-reports/documents/dprk_fissile_material_production_16Aug2012.pdf.

⁴³ ADM William Gortney, "Protecting the Homeland," Speech at The Atlantic Council, Washington DC, October 7, 2015.

⁴⁴ "U.S. to China: Quit Cyber Spying," *Reuters*, September 22, 2015.

⁴⁵ Jeffrey Goldberg, "Obama's Crystal Clear Promise to Stop Iran from Getting a Nuclear Weapon," *The Atlantic*, October 2, 2012.

known as the Iran nuclear deal, has gone into effect, Iran's nuclear program no longer poses an immediate challenge. But if the internationally agreed-upon limits to Iran's nuclear program were to be violated for any reason, the Iranian nuclear issue could once again become the subject of serious international attention. Moreover, with the expiration of key nuclear restraints after 10 and 15 years, uncertainty will remain about future Iranian intentions and capabilities.

U.S. Strategic Doctrine

What is the U.S. approach for dealing with these strategic challenges? America's strategic doctrine was last articulated in the 2010 Nuclear Posture Review (NPR).⁴⁶ While the U.S. strategic environment has been greatly altered in subsequent years as the above discussion makes clear, at the broadest level, the ends and means of U.S. doctrine remain largely unchanged. This section will begin with a discussion of the constants and conclude with a consideration of the current debate in Washington about possible adjustments to its strategic posture to address new challenges.

According to the NPR, U.S. strategic goals include: preventing nuclear proliferation and nuclear terrorism; reducing the role of U.S. nuclear weapons; maintaining strategic deterrence and stability at reduced nuclear force levels; strengthening regional deterrence and reassuring U.S. allies and partners; and sustaining a safe, secure and effective nuclear arsenal.

Perhaps the most important of these goals for the strategic chain project is the U.S. desire to maintain strategic deterrence and stability with Russia and China. Washington would like to deter attacks against the United States and its allies, reassure Moscow and Beijing that Washington is not seeking to undermine their nuclear deterrents, and also avoid costly and potentially destabilizing arms races. The United States is also committed to pursuing

high-level, bilateral dialogues with Russia and China aimed at promoting more stable, resilient, and transparent strategic relationships.

While President Obama looked forward to a "world without nuclear weapons" in the aforementioned Prague speech, he also recognized that this goal will not be achieved in the near future. For this reason, the NPR states that so long as nuclear weapons exist, the United States will sustain a "safe, secure, and effective nuclear arsenal." The United States has committed to retaining and modernizing all three legs of its nuclear triad, including ICBMs, SLBMs, and strategic bombers. It also keeps a small number of forward deployed nonstrategic nuclear weapons in Europe, and another small stockpile of nonstrategic nuclear weapons in the United States, for possible deployment in support of extended deterrence to allies and partners elsewhere.

The Obama administration remains open to further negotiated nuclear reductions with Russia, and has indicated that it is prepared, in tandem with Moscow, to reduce its deployed strategic nuclear warheads to one-third below the New START level. At present, however, Moscow does not appear interested in additional arms control measures and insists that further reductions in strategic nuclear forces be accompanied by limits on what it regards as non-nuclear strategic capabilities, such as missile defenses. And given Moscow's recent behavior, there are questions about its willingness to engage in related negotiations in the future.

To "reduce the role of nuclear weapons in U.S. national security strategy," Washington, among other steps, has strengthened its negative security assurances. Unlike China and India, the United States does not maintain a "no first use" policy (NFU). The United States does vow, however, not to use, or threaten to use, nuclear weapons against non-nuclear weapons states that are party to the NPT and in compliance with their nuclear non-proliferation obligations. In other words, Washington will only

⁴⁶ U.S. Department of Defense, Nuclear Posture Review Report, April 2010.

consider the use, or threats to use, nuclear weapons against other nuclear-armed states, or against non-nuclear weapons states in violation of their NPT commitments. In addition, the NPR states that Washington will “only consider the use of nuclear weapons in extreme circumstances to defend the vital interests of the United States or its allies and partners.” To further reduce reliance on nuclear weapons, the United States promised to strengthen conventional capabilities as a means of deterring non-nuclear attack, with the eventual goal of making deterrence of a nuclear attack the sole purpose of America’s nuclear weapons.

In addition to its nuclear forces, U.S. strategic posture also includes regional and homeland missile defenses and the development of conventional prompt global strike (CPGS) capabilities. It must be emphasized that these capabilities are intended to contribute to the regional deterrence architecture to address emerging threats, such as those posed by North Korea and Iran. They are not aimed at, nor will they meaningfully affect, the strategic balance between the United States and Russia or China. Missile defense interceptors are deployed in small numbers and are intended to deter a limited attack from North Korea (or in the future, potentially Iran). U.S. missile defenses could not meaningfully blunt a large-scale Russian or Chinese nuclear attack. Similarly, CPGS will play only a niche role in regional conflicts, such as in counterterrorism operations. The United States is not acquiring them in large numbers and they will not be able to hold at risk Russia or China’s nuclear deterrent.

U.S. nuclear and conventional forces are enabled by cyber and space capabilities and the United States will ensure the resiliency of these networks and deter and, if necessary, respond to attacks against them.

To prevent nuclear proliferation and nuclear terrorism, Washington seeks to strengthen the nuclear non-proliferation regime, reverse North Korea and

Iran’s nuclear ambitions, secure vulnerable nuclear materials worldwide, and pursue other related arms control efforts.

While much of U.S. strategic doctrine has remained constant, the deteriorating security environment has opened up debates in Washington about whether the United States needs to take steps to reinforce deterrence. There is a growing recognition that the United States and NATO must adapt NATO’s nuclear deterrence policy and posture to meet the Russian nuclear threat, such as publically reaffirming the important role of nuclear weapons in the NATO Alliance. The United States is also considering options for responding to Russia’s INF violations, which, according to testimony from Department of Defense officials, include active defenses, counterforce capabilities, and countervailing strike capabilities.⁴⁷ Finally, while the Obama administration believes that current plans to modernize the European-based nuclear deterrent are sufficient, some outside analysts and former government officials have recommended changes to U.S. nuclear posture to provide the United States with more flexible options for dealing with threatened Russian “de-escalatory” nuclear strikes.⁴⁸

U.S. Strategic Policy in Asia

The previous section reviewed U.S. strategic doctrine broadly, but how do these concepts apply in the Asian context? It is to this subject to which we will now turn.

While not part of this “strategic chain” project, ***Russia*** bears on strategic issues in Asia as two of the major nuclear powers in Asia, the United States and to a lesser extent China, view Russia as a strategic competitor and this could affect strategic dynamics in Asia in a number of ways. Developments in Russia’s strategic doctrine or posture could directly affect the security of the United States and China. More-

⁴⁷ Statement of Brian P. McKeon, Principal Deputy Undersecretary of Defense for Policy, House Armed Services Subcommittee on Strategic Forces, December 10, 2014.

⁴⁸ Statement of Evelyn N. Farkas, Former Deputy Assistant Secretary of Defense for Russia/Ukraine/Eurasia, House Armed Services Committee, February 10, 2016.

over, steps Washington or Beijing take to address the threat posed by Moscow could in turn affect Asian security dynamics. Capabilities these states develop to counter the Russian threat, for example, may serve to threaten, or reassure, other nations in Asia. Similarly, U.S. credibility as revealed in the European theater may send signals about U.S. resolve to deter potential adversaries and defend allies in Asia.

Noting the possible impact of Russia on U.S. policy in Asia, this section will begin with a discussion of the most worrisome near-term threat to U.S. interests in Asia: **North Korea**. As highlighted above, Pyongyang's expanding nuclear and missile program poses a direct threat to the United States and its allies and, as U.S. forces and its homeland become more vulnerable, these capabilities challenge Washington's willingness and ability to defend its regional allies against the North Korean threat. The United States does not accept North Korea as a nuclear-armed state and its stated policy is aimed at capping and then rolling back North Korea's nuclear capability and creating a "denuclearized" Korean Peninsula. Washington hopes to achieve this goal through multilateral diplomacy, backed by pressure as necessary. The recent progress toward U.N. sanctions against North Korea in response to its satellite test may be a helpful step in this direction.⁴⁹

As long as North Korea maintains nuclear weapons, however, Washington must defend itself and its allies. In addition to U.S. nuclear and conventional capabilities, this defense includes limited regional and homeland ballistic missile defenses, including the currently discussed deployment of a THAAD battery to South Korea.⁵⁰ It is important to stress once again, however, that these defenses are sufficient for dealing with the limited threat posed by North Korea, but that they could not meaningfully blunt a large-scale Russian or Chinese attack. Finally, given Pyongyang's history of transferring nuclear and military technology, the United States seeks to deter future sensitive military exports through a number

of means, including its declaratory policy and the Proliferation Security Initiative (PSI).

Another important U.S. priority in Asia concerns reassuring **regional allies**. The United States maintains longstanding, formal defense pacts with several states in Asia, including Japan, South Korea, Australia, the Philippines, and Thailand. When it comes to strategic matters, however, the relationships with Japan and South Korea are most salient as these are the countries in immediate danger from the North Korean nuclear threat. Here, Washington's goals are to assure Japan and South Korea that their security is adequately provided for through their alliance with the United States and also to dissuade these states from developing independent nuclear capabilities. This policy contributes to regional stability because if it were not for U.S. security guarantees, these states would likely take unilateral steps to defend themselves, including possibly building nuclear weapons, which could destabilize the region and provoke a regional arms race.

To contribute to this reassurance goal, Washington maintains large military bases in Japan and South Korea. Further, as mentioned above, the United States deploys theater and homeland missile defenses. In addition, it extends its strategic nuclear umbrella over the heads of its Asian allies. Unlike in Europe, where the United States maintains forward-deployed nonstrategic nuclear weapons, Washington long ago removed nuclear weapons from the territory of its Asian allies. Moreover, it cancelled its sea-based nuclear cruise missile program, which previously played a role in defense of those allies. The United States does, however, maintain U.S.-based "deployable," nuclear weapons that could be brought forward in a crisis on tactical fighter-bombers and heavy bombers. To increase the credibility of these forces, the United States takes a number of additional steps, such as using the forces to signal during crises and conducting joint exercises and strategic dialogues with allies. Finally, Washington actively works to dissuade allied nuclear prolifera-

⁴⁹ Farnaz Fassihi, "U.S., China Agree to Sanction North Korea on Nuclear Program," *The Wall Street Journal*, February 25, 2016.

⁵⁰ Choe Sang-Hun, "South Korea Tells China Not to Intervene in Missile-Defense System Talks," *The New York Times*, February 24, 2016.

tion. This includes discouraging South Korea from developing enrichment and reprocessing capabilities for peaceful purposes.

With regard to *China*, the United States continues to seek a stable strategic relationship. While there are serious concerns in Washington about the increasingly competitive nature of many aspects of Sino-U.S. interactions, Washington's overriding objective remains the maintenance of strategic deterrence and stability. The United States understands that China will take whatever steps necessary to maintain an assured retaliatory capability and Washington does not believe that U.S. programs, current or planned, would pose a threat to China's nuclear deterrent.

Washington does see potential dangers, however, as China expands and modernizes its nuclear arsenal. If Beijing were to greatly increase its strategic capabilities, narrowing the gap, or even achieving parity with Washington, America's allies in Asia might question the credibility of America's extended nuclear deterrent. The United States, therefore, must also seek to maintain a quantitative and/or qualitative edge over China. The only stable strategic equilibrium going forward, therefore, may be one in which China possesses a secure, second-strike capability (and Washington does not seek to undermine that capability) while the United States maintains a quantitative nuclear advantage (that China does not contest).⁵¹

Unlike in East Asia, the United States lacks formal allies and potential competitors in South Asia, but it does have strategic interests in the region. *India and Pakistan*, while not formal allies, are both friends of the United States. Washington does not feel threatened by these countries or their strategic capabilities. At the same time, Washington is concerned about the strategic competition playing out between these two nations and wants to help prevent these South Asian powers from engaging in military conflict, especially one that could escalate to a nuclear exchange. In past crises, the United States has

intervened diplomatically in an attempt to prevent disputes between these two powers from escalating and it is likely that Washington would act similarly in the future.

In addition, the United States is also concerned about what appears to be a growing nuclear arms race in the subcontinent and would like to encourage strategic restraint, consistent with the credible minimum deterrent capabilities that the two countries espouse. Washington's best means for facilitating restraint may be by encouraging high-level dialogue on these issues, including the adoption of additional confidence-building measures in the conventional and nuclear areas.

South Asia also presents another set of strategic challenges for the United States. As stated above, Washington wants to prevent nuclear terrorism and it also fears possible "loose nukes" scenarios. Pakistani scientist A.Q. Khan transferred sensitive nuclear technology to other countries in the past, and the United States wants to ensure strong nuclear export controls to prevent the spread of sensitive nuclear technology to state or non-state actors in the future. In addition, the United States fears nuclear terrorism. Given that violent non-state groups operate in the region, Washington encourages adherence to the highest standards of nuclear security.

Conclusion

In sum, America's security environment has deteriorated in recent years and there has been some discussion about strengthening U.S. and NATO nuclear posture to deal with the renewed Russian threat. At the broadest levels, however, U.S. strategic doctrine remains largely unchanged. As it applies to Asia, the United States seeks to: defend against and roll back North Korea's nuclear capability; assure regional allies; maintain and strengthen strategic stability with China; and prevent conflict and encourage strategic restraint in South Asia.

⁵¹ For more on this argument, see James Steinberg and Michael O'Hanlon, *Strategic Reassurance and Resolve: U.S.-China Relations in the 21st Century* (Princeton: Princeton University Press, 2014).

Annex E. Background: Nuclear Forces of China, India, Pakistan, and the United States

The following background material was prepared by James Tyson, Strategic Chain Project Coordinator, Brookings Institution, based on open sources.

China's Nuclear Forces

The following provides an overview of the size, force structure, and modernization plans for China's nuclear forces. It also includes an account of nuclear-related capabilities, including missile defense, space programs, and cyber capabilities.

Size of the force

China's nuclear forces, though small, are growing in number and variety. It is estimated that China possesses approximately 260 nuclear warheads—an increase of 10 warheads from 2013⁵²—which can be delivered via land-based ballistic missiles, aircraft, and nuclear powered submarines. Unlike the U.S. nuclear arsenal, which is divided among branches of the military, China's entire nuclear triad is reportedly under the control of the People's Liberation Army Rocket Force (PLARF)—formerly the Second Artillery.⁵³

China fields a range of Dongfeng (DF)-series land-based ballistic missiles, which make up approximately two-thirds of its total arsenal. Of the DF-series missiles, only the DF-5 can carry more

than one warhead, via a multiple independently-targetable reentry vehicle (MIRV).⁵⁴ It's estimated that weight constraints prevent this new missile, the DF-5B, from carrying more than two or three warheads.⁵⁵ China's long range and intercontinental ballistic missiles, the DF-4, DF-5 and DF-31, have ranges of 5,500 km to 13,000-plus km.⁵⁶ Its intermediate-range ballistic missile, the DF-3A, has a range of 3,000 km and its DF-15 and DF-21 short and medium-range ballistic missiles (SRBMs) have ranges of 600 km and 2,150 km, respectively. Information on the locations of China's nuclear missiles is scarce. An estimated 44 of China's long-range missiles, which can carry a total of 64 warheads, are capable of reaching the continental United States.⁵⁷

Until recently, China possessed only a nuclear dyad of ICBMs and nuclear-capable aircraft. But, in December 2015, U.S. military officials reportedly confirmed that the People's Liberation Army Navy (PLAN) had deployed a nuclear ballistic missile submarine on a deterrent patrol.⁵⁸ Following the patrol by the Type-094 Jin-class SSBN, China is now judged to possess an operational at-sea second-strike capability.⁵⁹ By 2015 China had three Jin-class submarines, each of which can carry 12 submarine-launched ballistic missiles (SLBMs) and may field a total of five to eight by 2020.^{55, 56} China possesses two types of SLBMs, the JL-1 and JL-2, with ranges of 1,000-plus km and 7,000-plus km, respectively. The JL-1 was designed for China's Type-092 Xia-class submarine, which is not considered opera-

⁵² Hans Kristensen, "Chinese nuclear forces, 2013," *Bulletin of the Atomic Scientists*, 2013, p. 80, <http://bos.sagepub.com/content/69/6/79.full.pdf+html>.

⁵³ Shannon Tiezzi, "The New Military Force in Charge of China's Nuclear Weapons," *The Diplomat*, January 5, 2016, <http://thediplomat.com/2016/01/the-new-military-force-in-charge-of-chinas-nuclear-weapons/>.

⁵⁴ Hans Kristensen, "Pentagon Report: China Deploys MIRV Missile," *Federation of American Scientists*, May 11, 2015, <https://fas.org/blogs/security/2015/05/china-mirv/>.

⁵⁵ David Wright, "China and MIRVed Warheads," *Union of Concerned Scientists*, May 20, 2015, <http://allthingsnuclear.org/dwright/china-and-mirved-warheads/>.

⁵⁶ Hans Kristensen, "Chinese nuclear forces, 2015," *Bulletin of the Atomic Scientists*, p. 78, <http://bos.sagepub.com/content/71/4/77.full.pdf+html>.

⁵⁷ Hans Kristensen, "Chinese nuclear forces, 2015," p. 80.

⁵⁸ Benjamin D. Baker, "China Deploys First Nuclear Deterrence Patrol," *The Diplomat*, December 19, 2015, <http://thediplomat.com/2015/12/china-deploys-first-nuclear-deterrence-patrol/>.

⁵⁹ Bill Gertz, "China conducts JL-2 sub missile test," *Washington Times*, February 18, 2015, <http://www.washingtontimes.com/news/2015/feb/18/inside-the-ring-china-tests-nuclear-missile-for-su/?page=all>.

⁶⁰ Richard D. Fisher, Jr., "US upgrades assessment of China's Type 094 SSBN fleet," *IHS Jane's*, April 19, 2015, <https://caravantomidnight.com/u-s-upgrades-assessment-of-chinas-type-094-ssbn-fleet/>.

⁶¹ Hans Kristensen, "Chinese nuclear forces, 2015," p. 81.

tional. Hence, experts view the JL-2, which is under development and was tested as recently as 2015,⁶² as the PLAN's future SLBM.

China also has two cruise missiles that may be nuclear-capable, the CJ-10 and CJ-20.⁶³ The former, a land-attack cruise missile, has an estimated range of 1,500 km.⁶⁴ The latter, thought to be an air-launched cruise missile, is still under development.⁶⁵ According to U.S. estimates from 2013, these cruise missiles may be deployed as early as 2018.⁶⁶ It is thought to have a range of approximately 2,200 km, and will likely be carried by the H-6 bomber.⁶⁷

Nuclear-related capabilities

China is pursuing missile defense capabilities at various ranges. It has purchased four to six Russian S-400 systems, and expects to receive them by 2017.⁶⁸ The S-400's interceptors can engage threats at ranges of up to 400 km,⁶⁹ including aircraft, cruise missiles, and short and medium-range ballistic missiles.⁷⁰

While China has not yet decided to deploy strategic ballistic missile defenses, it has explored BMD tracking and interception technologies for five decades⁷¹

and Chinese development of BMD is ongoing.⁷² State-run media has claimed several anti-ballistic missile tests, including in 2010, 2013, and 2014⁷³—though some of these tests may actually have been anti-satellite tests.⁷⁴ According to experts, China's program is sufficiently mature that it does have the option to more aggressively pursue its own ballistic missile defense capability.⁷⁵

China has tested anti-satellite capabilities on several occasions, most notably in 2007, when it destroyed a defunct, orbiting satellite with a missile and generated extensive space debris.⁷⁶ More recently, China has tested its SC-19 and DN-2 missiles against sub-orbital targets, launching from its Korla test range in Xinjiang Province.⁷⁷ A new weapon, the DN-3, may be capable of intercepting targets at higher orbits.⁷⁸

In June 2015, the Chinese Ministry of Defense seemed to acknowledge reports that it had tested a hypersonic missile delivery vehicle. The Ministry of Defense statement said that “scheduled scientific research...is not targeted at any country.”⁷⁹ The hypersonic glide vehicle in question, designated Wu-14, is believed to be capable of carrying a nuclear or con-

⁶² Bill Gertz, “China conducts JL-2 sub missile test”.

⁶³ Hans Kristensen, “Chinese nuclear forces, 2015,” p. 82.

⁶⁴ Hans Kristensen, “Chinese nuclear forces, 2015,” p. 78.

⁶⁵ Hans Kristensen, “Chinese nuclear forces, 2015,” p. 83.

⁶⁶ Global Security, “DH-10,” <http://www.globalsecurity.org/wmd/world/china/lacm.htm>.

⁶⁷ Global Security, “DH-10”.

⁶⁸ Franz-Stefan Gady, “China to Receive Russia's S-400 Missile Defense Systems in 12-18 Months,” *The Diplomat*, November 17, 2015, <http://thediplomat.com/2015/11/china-to-receive-russias-s-400-missile-defense-systems-in-12-18-months/>.

⁶⁹ Dave Majumdar, “Get Ready: Russia's Lethal S-400 Air Defense System Is Headed to Syria,” *The National Interest*, November 25, 2015, <http://nationalinterest.org/blog/the-buzz/payback-russias-lethal-s-400-air-defense-system-headed-syria-14446>.

⁷⁰ *Sputnik News*, “Russia's S-400 Missile Defense System Has No Equal Globally,” November 11, 2015, <http://sputniknews.com/military/20151111/1029903504/russia-s400-missile-defense-weaponry.html>.

⁷¹ Bruce MacDonald, “Chinese Strategic Missile Defense: Will It Happen, and What Would It Mean?,” *Arms Control Association*, November 2015, https://www.armscontrol.org/ACT/2015_11/Features/Chinese-Strategic-Missile-Defense-Will-It-Happen-and-What-Would-It-Mean.

⁷² Bruce Macdonald, “Understanding the Dragon Shield: Likelihood and Implications of Chinese Strategic Ballistic Missile Defense,” September 2015, p3, https://fas.org/wp-content/uploads/2015/09/DragonShieldreport_FINAL.pdf.

⁷³ Zachary Keck, “China Conducts Third Anti-Missile Test,” *The Diplomat*, July 24, 2014, <http://thediplomat.com/2014/07/china-conducts-third-anti-missile-test/>.

⁷⁴ Franz-Stefan Gady, “Revealed: China Tests Secret Missile Capable of Hitting US Satellites,” *The Diplomat*, November 11, 2015, <http://thediplomat.com/2015/11/revealed-china-tests-secret-missile-capable-of-hitting-us-satellites/>.

⁷⁵ MacDonald, “Understanding the Dragon Shield,” p. 36.

⁷⁶ Marc Kaufman and Dafna Linzer, “China Criticized for Anti-Satellite Missile Test,” *The Washington Post*, January 19, 2007, <http://www.washingtonpost.com/wp-dyn/content/article/2007/01/18/AR2007011801029.html>.

⁷⁷ Bill Gertz, “China Tests Anti-Satellite Missile,” *The Washington Free Beacon*, November 9, 2015, <http://freebeacon.com/national-security/china-tests-anti-satellite-missile/>.

⁷⁸ Ibid.

⁷⁹ Zachary Keck, “Why America Should Fear China's Hypersonic Nuclear Missile,” *The National Interest*, <http://nationalinterest.org/blog/the-buzz/why-america-should-fear-chinas-hypersonic-nuclear-missile-13115>.

ventional warhead. It can travel at Mach 10 and is reportedly highly maneuverable, making it capable of evading U.S. missile defenses.⁸⁰ Most of its recent tests were deemed successful, but there is no public timeline for its entry into service.⁸¹

China's cyber capabilities are extensive, and include offensive capabilities.⁸² China set up its first specialized cyber-focused unit in 2010, and is now working to create a central cyber warfare command.⁸³ In 2015, the U.S. and China began negotiations on a cyber arms control agreement in which both parties would pledge not to be the first to use cyber weapons to damage each other's critical infrastructure in peacetime.⁸⁴

Modernization

China is reportedly developing a new road-mobile ICBM, the DF-41, which may be capable of carrying multiple warheads.⁸⁵ In one of the recent tests, in December 2015, a canisterized DF-41 was reportedly launched from a rail car in western China. China is replacing its ICBMs, including the liquid-fueled, silo-based DF-5A missile, with newer, mobile, solid-fueled missiles, such as the DF-31A.⁸⁶

China is working on a new class of SSBN, the Type-096. This new, longer-range Tang-class submarine is still in the design stages,⁸⁷ but some estimates in-

dicates that it may be capable of carrying up to 24 SLBMs.⁸⁸

Recent media reports in Chinese publications have raised the possibility of a new Chinese long-range bomber. Articles in Chinese media have emphasized China's need for a stealthy bomber capable of penetrating enemy air defenses and striking targets at beyond medium ranges. According to China Daily, the bomber would have a minimum range of 8,000 km without refueling, and a payload of at least 10 tons.⁸⁹ This information hews closely to previously reported details of a Chinese subsonic long-range strike bomber, designated H-20.⁹⁰ But a Chinese expert stressed that it would take time for China to develop a suitable airframe and engine for such an aircraft.⁹¹

India's Nuclear Forces

The following provides an overview of the size, force structure, and modernization plans for India's nuclear forces. It also includes an account of nuclear-related capabilities, including missile defense, space programs, and cyber capabilities.

Size of the force

India's nuclear deterrent consists of around 100-120 warheads,⁹² of which approximately 56 are housed

⁸⁰ Ibid.

⁸¹ Kyle Mizokami, "China Successfully Tests Hypersonic Weapon System," April 28, 2016, <http://www.popularmechanics.com/military/research/a20604/china-successfully-tests-hypersonic-weapon-system/>.

⁸² Elise Viebeck, "Powerful Chinese Cyber Weapon Attacked US Coding Site," April 10, 2015, <http://thehill.com/policy/cybersecurity/238423-powerful-chinese-cyber-weapon-attacked-us-coding-site>.

⁸³ "Central Cyber Warfare Command for PLA," *The Straits Times*, October 24, 2015, <http://www.straitstimes.com/asia/east-asia/central-cyber-warfare-command-for-pla>.

⁸⁴ David Sanger, "U.S. and China Seek Arms Deal for Cyberspace," *The New York Times*, <http://www.nytimes.com/2015/09/20/world/asia/us-and-china-seek-arms-deal-for-cyberspace.html>.

⁸⁵ Hans Kristensen, "Chinese nuclear forces, 2015," p. 80.

⁸⁶ Nicolas Giacometti, "China's Nuclear Modernization and the End of Nuclear Opacity," *The Diplomat*, April 10, 2014, <http://thediplomat.com/2014/04/chinas-nuclear-modernization-and-the-end-of-nuclear-opacity/>.

⁸⁷ Has Kristensen, "Is China Planning to Build More Missile Submarines," Federation of American Scientists, April 23, 2015, <https://fas.org/blogs/security/2015/04/china-sub/>.

⁸⁸ Skyppek, Thomas, "China's Sea-Based Nuclear Deterrent in 2020: Four Alternative Futures for China's SSBN Fleet," CSIS, October 2011, p110, <http://chinapower.csis.org/ssbn/>.

⁸⁹ Franz-Stefan Gady, "China Wants to Develop a New Long-Range Strategic Bomber," *The Diplomat*, July 13, 2015 <http://thediplomat.com/2015/07/china-wants-to-develop-a-new-long-range-strategic-bomber/>.

⁹⁰ Jason Lomberg, "China Developing Subsonic Stealth Bomber," September 24, 2014, <http://www.ecnmag.com/blog/2014/09/china-developing-subsonic-stealth-bomber>.

⁹¹ "China Needs Long Range Strategic Bomber: State Media," AFP, July 7, 2015, <http://news.yahoo.com/china-needs-long-range-strategic-bomber-state-media-084622579.html>.

⁹² Hans Kristensen and Robert Norris, "Status of World Nuclear Forces," <http://fas.org/issues/nuclear-weapons/status-world-nuclear-forces/>.

in land-based ballistic missiles, approximately 48 in gravity bombs, and 14 in sea-based ballistic missiles.⁹³ India is currently expanding its arsenal at a rate of approximately five warheads per year.⁹⁴ Its nuclear weapons are under the control of the Nuclear Command Authority⁹⁵ and Strategic Forces Command.⁹⁶

While India is developing land and sea-based⁹⁷ delivery platforms for its nuclear weapons, its two to three squadrons of Mirage 2000H and Jaguar IS/IB fighter-bombers remain at the core of its nuclear strike force, with a range that extends deep into Pakistan and China.⁹⁸ India's two Mirage 2000 squadrons, of which one is likely assigned a secondary nuclear strike mission, are based at Maharajpur Air Force Station at Gwalior. Ambala,⁹⁹ Jamnagar,¹⁰⁰ and Gorakhpur¹⁰¹ air bases are home to India's six squadrons of Jaguar IS/IB fighters, two of which may be assigned a secondary nuclear strike mission.¹⁰² India's operational land-based ballistic missiles are the short-range Prithvi-2 and Agni-1, the medium-range Agni-2, and the intermediate-range Agni-3.¹⁰³ India is also developing and testing the longer-range Agni-4 and Agni-5. The nuclear or conventionally-armed Prithvi-2 has a range of 250-350

km.¹⁰⁴ The road-mobile Agni-1 is also conventional or nuclear-capable, with a range of approximately 700 km. The Agni-1 is thought to be oriented towards Pakistan, with most launchers deployed in western India. The medium-range, rail-mobile Agni-2 has a range of approximately 2,000 km. Fewer than 10 launchers are stationed in northern India, likely targeting western, central, and southern China. The intermediate-range, rail-mobile Agni-3 can deliver a nuclear warhead at ranges exceeding 3,200 km. In 2007, an Indian army spokesman said that it was capable of striking Shanghai, but to do so the missile would have to be deployed in the extreme northeastern regions of India.¹⁰⁵

To complement its fighter-bombers and ballistic missiles, India is developing a sea-based nuclear weapons capability consisting of indigenous nuclear-powered ballistic missile submarines (SSBNs) and a ship-launched ballistic missile. Its first SSBN, the Arihant, embarked on sea trials in 2014, and in February 2016, was undergoing its final tests in the Bay of Bengal before entering service.¹⁰⁶ The Arihant will eventually carry the K-15 submarine-launched ballistic missile (SLBM), which has a range of 700 km.¹⁰⁷

⁹³ Hans Kristensen, "Indian nuclear forces, 2015," *Bulletin of the Atomic Scientists*, 2015, p79, <http://bos.sagepub.com/content/71/5/77.full.pdf+html>.

⁹⁴ Ashley Tellis, "China, India, And Pakistan – Growing Nuclear Capacities With No End in Sight," Testimony for the Subcommittee on Strategic Forces, Senate Armed Services Committee, February 25, 2015, <http://carnegieendowment.org/2015/02/25/china-india-and-pakistan-growing-nuclear-capabilities-with-no-end-in-sight>.

⁹⁵ Kerry Boyd, "India Establishes Formal Nuclear Command Structure," *Arms Control Today*, January 2003, https://www.armscontrol.org/act/2003_01-02/india_janfeb03.

⁹⁶ Rajat Pandit, "Nuke Command Set Up, Button in PM's hand," *The Times of India*, January 4, 2003, <http://timesofindia.indiatimes.com/India/Nuke-command-set-up-button-in-PMs-hand/articleshow/33382162.cms?referral=PM>.

⁹⁷ "What Lurks Beneath," *The Economist*, February 6, 2016, <http://www.economist.com/news/asia/21690107-nuclear-arms-race-sea-what-lurks-beneath>.

⁹⁸ Hans Kristensen, "Indian nuclear forces, 2015," p. 78.

⁹⁹ "Air Force's Jaguar Fighter Jet Crashes in Haryana; Pilot Ejects Safely," March 5, 2015, <http://www.ndtv.com/india-news/air-forces-jaguar-fighter-jet-crashes-near-panipat-in-haryana-pilot-ejects-safely-744490>.

¹⁰⁰ Pranjal Bhuyanl, "Jaguars Fly Out of Pune Skies for Good," *The Times of India*, February 13, 2008, <http://timesofindia.indiatimes.com/city/pune/Jaguars-fly-out-of-Pune-skies-for-good/articleshow/2777887.cms>.

¹⁰¹ Ajai Shukla, "Facing Dwindling Numbers, Jaguar Upgrade Crucial for Indian Air Force," *Business Standard*, March 27, 2015 http://www.business-standard.com/article/economy-policy/facing-dwindling-numbers-jaguar-upgrade-crucial-for-indian-air-force-115032700053_1.html.

¹⁰² Hans Kristensen, "Indian nuclear forces, 2015," p. 78.

¹⁰³ Ibid.

¹⁰⁴ Ibid.

¹⁰⁵ Ibid p. 80.

¹⁰⁶ Samuel Osborne, "INS Arihant: India Nears Completion of Nuclear Submarine 'Slayer of Enemies' – So What Does It Mean for the World?" *The Independent*, February 27, 2016, <http://www.independent.co.uk/news/world/asia/india-nears-completion-of-nuclear-submarine-named-slayer-of-enemies-a6899881.html>.

¹⁰⁷ Hans Kristensen, "Indian nuclear forces, 2015," p. 81.

Nuclear-related capabilities

India is currently working to develop missile defense capabilities at various ranges.¹⁰⁸ New Delhi is negotiating purchase of the Russian S-400 air defense system, which is capable of intercepting short and medium-range ballistic missiles, and cruise missiles.¹⁰⁹ India's Defense Research and Development Organization (DRDO) has also recently begun to test indigenous endo and exo-atmospheric missile defense systems—designated Advanced Air Defense (AAD)¹¹⁰ and Prithvi Air Defense (PAD),¹¹¹ respectively. Experts estimate that a mature Indian BMD system is still at least a decade away.¹¹²

In 2012, DRDO chief V. K. Saraswat raised the possibility of Indian anti-satellite (ASAT) programs, which might incorporate the Agni-V.¹¹³ But other Indian defense scientists have stressed that such capabilities are only in the discussion phase.¹¹⁴

Modernization plans

India is in the midst of upgrading and extending the service life of its Mirage and Jaguar fighter-bombers.¹¹⁵ The Jaguar IS/IB upgrade program will likely be delayed beyond its original 2017-2018 dead-

line.¹¹⁶ India may also be searching for a new fighter-bomber to replace its aging fleet, and has officially confirmed the purchase of 36 Rafale aircraft from France to take up that role.¹¹⁷

DRDO is currently developing the rail-mobile Agni-4 and Agni-5 missiles,¹¹⁸ which are intended for maximum ranges of 3,500-plus km and 5,000 km, respectively, and will be capable of striking China from more central deployment locations in India. The Agni-4 underwent a successful test launch in November 2015 and will undergo several additional induction tests before it enters service in the next two to three years.¹¹⁹ The Agni-5 was successfully launched from a canister in January 2015, and will reportedly be deployed after another two to three successful tests. According to an unnamed DRDO scientist, once the Agni-5 is operational, India may focus on developing multiple independently-targetable reentry vehicles and more maneuverable warheads.¹²⁰

In addition to the Arihant, India is currently building another ballistic missile submarine, the Aridhman,¹²¹ and plans to have four SSBNs in service by 2020.¹²² India is also developing a new SLBM

¹⁰⁸ Ankit Panda, "India Tests Supersonic Advanced Air Defense Missile," *The Diplomat*, November 23, 2015, <http://thediplomat.com/2015/11/india-tests-supersonic-advanced-air-defense-missile/>.

¹⁰⁹ Aditya Bhat, "India, Russia Negotiating Sale of S-400 Missiles to India: Russian Envoy," *International Business Times*, February 12, 2016, <http://www.ibtimes.co.in/india-russia-negotiating-sale-s-400-missiles-india-russian-envoy-666728>.

¹¹⁰ Ankit Panda, "India Tests Supersonic Advanced Air Defense Missile," *The Diplomat*, November 23, 2015, <http://thediplomat.com/2015/11/india-tests-supersonic-advanced-air-defense-missile/>.

¹¹¹ Hemant Kumar Rout, "Prithvi Defense Vehicle Fails to Intercept," *The New Indian Express*, May 15, 2014, <http://www.newindianexpress.com/states/odisha/Prithvi-Defense-Vehicle-Fails-to-Intercept/2014/05/15/article2225945.ece>.

¹¹² Sushant Singh, "Interceptor Missile Tested 7 Times, DRDO's Rajinikanth Moment Still Far," *The Indian Express*, May 4, 2015, <http://indianexpress.com/article/explained/interceptor-missile-tested-7-times-drdos-rajinikanth-moment-still-far/>.

¹¹³ Rajat Pandit, "After Agni-V Launch, DRDO's New Target is Anti-Satellite Weapons," *The Times of India*, April 21, 2012, <http://timesofindia.indiatimes.com/india/After-Agni-V-launch-DRDOs-new-target-is-anti-satellite-weapons/articleshow/12763074.cms>.

¹¹⁴ Ibid.

¹¹⁵ Rajat Pandit, "Amid Stalled Fighter Projects, Upgraded Mirage Cheers IAF," *The Times of India*, March 23, 2015, <http://timesofindia.indiatimes.com/india/Amid-stalled-fighter-projects-upgraded-Mirage-cheers-IAF/articleshow/46657297.cms>.

¹¹⁶ Hans Kristensen, "Indian nuclear forces, 2015," p.78.

¹¹⁷ "India Signs Agreement to Buy 36 French Rafale Fighter Jets," *France 24*, <http://www.france24.com/en/20160125-india-signs-deal-buy-36-french-rafale-fighter-jets>.

¹¹⁸ "India Successfully Test Fires Agni-V," Ministry of Defense, January 20, 2014, http://www.drdo.gov.in/drdo/English/dpi/press_release/Agni-4-21012014.pdf.

¹¹⁹ Rajat Pandit, "Ballistic Missile Agni-IV Test-Fired As Part of User Trial," *The Times of India*, November 9, 2015, <http://timesofindia.indiatimes.com/india/Ballistic-missile-Agni-IV-test-fired-as-part-of-user-trial/articleshow/49720522.cms>.

¹²⁰ "DRDO Gears Up for Canister Launch of Agni-V," *The New Indian Express*, February 1, 2016, <http://www.newindianexpress.com/states/odisha/DRDO-Gears-up-for-Canister-Launch-of-Agni-V/2016/02/01/article3255695.ece>.

¹²¹ Ankit Panda, "India's Next Warships and Submarines Will Have to be Built at Home," *The Diplomat*, May 3, 2015, <http://thediplomat.com/2015/05/indias-next-warships-and-submarines-will-have-to-be-built-at-home/>.

¹²² Samuel Osborne, "INS Arihant: India Nears Completion of Nuclear Submarine 'Slayer of Enemies' – So What Does It Mean for the World?" *The Independent*, February 27, 2016, <http://www.independent.co.uk/news/world/asia/india-nears-completion-of-nuclear-submarine-named-slayer-of-enemies-a6899881.html>.

to succeed the K-15. Designated K-4, the new missile is currently undergoing initial testing and is intended to have a range of 3,000-plus km.¹²³

India is also developing a subsonic nuclear-capable cruise missile, the Nirbhay, with a range of 1,000 km and designed for launch from land, air, or sea. In October 2015, the missile failed a flight test—its second failure in three attempts.¹²⁴

Though it conducts offensive and defensive cyber operations,¹²⁵ India lacks an integrated cyber command. The Modi government has prioritized creating such a body,¹²⁶ which would oversee cyber offense and defense.¹²⁷

Pakistan's Nuclear Forces

The following provides an overview of the size, force structure, and modernization plans for Pakistan's nuclear forces. It also includes an account of nuclear-related capabilities, including missile defense and cyber capabilities.

Size of the force

Pakistan's arsenal stands at 110 to 130 warheads.¹²⁸ Based on Pakistan's production of fissile material, some experts have estimated that Pakistan may be building 20 nuclear warheads per year.¹²⁹ Pakistan's

nuclear arsenal is under the control of the National Command Authority (NCA), with policies operationalized by the Strategic Plans Division.¹³⁰

Pakistan has a relatively small number of nuclear-capable delivery vehicles—many of which are dual-capable, and may thus be assigned conventional missions.¹³¹

Land-based ballistic missiles—six specific variants—are the backbone of Pakistan's nuclear forces, accounting for approximately 86 of its deployed warheads.¹³² Its shortest range missile, the Hatf-9, has a range of just 60 km, and is apparently intended for battlefield use.¹³³ The solid-fueled and road-mobile Hatf-2, Hatf-3, and Hatf-4 short-range ballistic missiles have maximum ranges of 180 km, 290 km, and 750 km, respectively.¹³⁴ Pakistan also possesses medium-range ballistic missiles, the road-mobile, liquid-fueled Hatf-5 and the solid-fueled Hatf-6, with ranges of 1,250 km and 1,500 km, respectively.¹³⁵

Pakistan's nuclear-capable aircraft include its F-16 A/B fighter-bombers, and possibly its Mirage III and Mirage Vs.¹³⁶ The F-16 A/Bs, purchased from the United States in the 1980s, are based at Mushaf Air Base, northwest of Lahore. The aircraft have a range of 1,600 km without drop tanks, and are most likely capable of carrying one nuclear gravity

¹²³ T.S. Subramanian, "Success on Debut for Undersea Launch of Missile," *The Hindu*, May 8, 2014, <http://www.thehindu.com/news/national/success-on-debut-for-undersea-launch-of-missile/article5986757.ece>.

¹²⁴ Rajat Pandit, "Nuclear-Capable Nirbhay Missile Bites the Dust for Second Time," *The Times of India*, October 16, 2015, <http://timesofindia.indiatimes.com/India/Nuclear-capable-Nirbhay-missile-bites-the-dust-for-second-time/articleshow/49417726.cms>.

¹²⁵ Damian Paletta, Danny Yadron and Jennifer Valentino-Devries, "Cyberwar Ignites a New Arms Race," *The Wall Street Journal*, October 11, 2015, <http://www.wsj.com/articles/cyberwar-ignites-a-new-arms-race-1444611128>.

¹²⁶ Rajat Pandit, "Govt gets cracking on three new tri-Service commands," *The Times of India*, August 20, 2015, <http://timesofindia.indiatimes.com/India/Govt-gets-cracking-on-three-new-tri-Service-commands/articleshow/48550424.cms>.

¹²⁷ Vivek Raghuvanshi, "India Still Unsure on Need for Cyber Command," *DefenseNews*, December 10, 2014, <http://www.defensenews.com/story/defense/international/asia-pacific/2014/12/10/india-still-unsure-on-need-for-cyber-command/20211759/>.

¹²⁸ Hans Kristensen, "Pakistani nuclear forces, 2015," *Bulletin of the Atomic Scientists*, 2015, p. 67, <http://bos.sagepub.com/content/early/2015/10/06/0096340215611090.full.pdf+html>.

¹²⁹ Tim Craig, "Report: Pakistan's Nuclear Arsenal Could Become the World's Third-Biggest," *The Washington Post*, August 27, 2015, https://www.washingtonpost.com/world/asia_pacific/report-pakistans-nuclear-arsenal-could-become-the-worlds-third-biggest/2015/08/26/6098478a-4c0c-11e5-80c2-106ea7fb80d4_story.html.

¹³⁰ Robert Sherman, "National Command Authority," *Federation of the American Scientists*, March 19, 2000, <http://fas.org/nuke/guide/pakistan/agency/nca.htm>.

¹³¹ Hans Kristensen, "Pakistani nuclear forces, 2015," p. 2.

¹³² Ibid p. 3.

¹³³ Ibid p. 5.

¹³⁴ Hans Kristensen, "Pakistani nuclear forces, 2015," pp. 4-5.

¹³⁵ Ibid p. 5.

¹³⁶ Ibid p. 4.

bomb each.¹³⁷ The Mirage III and Mirage V aircraft may also be equipped to carry nuclear bombs, and a Mirage fighter was used to test the Hatf-8 nuclear-capable air-launched cruise missile as recently as January 2016.¹³⁸

Nuclear-related capabilities

Pakistan's missile defense capability is currently limited to the FM-90 short-range air defense system, which it purchased from China, where it is designated HQ-7B. The system is an upgraded version of the HQ-7, which is, in turn, a copy of the French Crotale surface-to-air missile.¹³⁹ Pakistani media reports that the FM-90 is intended to engage cruise missiles, drones, air-to-ground missiles, and aircraft¹⁴⁰ at limited ranges.¹⁴¹

In 2015, Pakistan reportedly began negotiating with China over purchasing Chinese HQ-9 and HQ-16 missile defense systems.¹⁴² The HQ-9 is a long-range, high-altitude surface-to-air missile system which is similar to the Russian S-300 system, and is designed to counter aircraft, cruise missiles, air-to-ground missiles, and tactical ballistic missiles.¹⁴³ The HQ-16 is a medium-range surface-to-air missile defense system that is similar to Russia's SA-11 or SA-17.

Occasional reports have noted an extant Pakistani offensive cyber capability,¹⁴⁴ but government statements have focused on cybersecurity and developing norms of behavior in cyberspace for Pakistan and its neighbors. In 2013, Pakistan's Senate Defense Committee proposed a seven-point plan to promote cybersecurity, which included establishing a cybersecurity task force, a national computer emergency response team, and an Inter-Services Cyber Command, which would coordinate "cyber security and cyber defense for the Pakistan Armed Forces."¹⁴⁵

Modernization

Pakistan is currently developing two additional nuclear-capable ballistic missiles—the short-range Shaheen-1A, and the medium-range Shaheen-3.¹⁴⁶ The former is intended to have a range of approximately 900 km, and the latter a range of 2,750 km. Both missiles were tested in December 2015, with positive results.^{147, 148} When operational, the Shaheen-3 would be capable of targeting strategic locations throughout India.¹⁴⁹

Pakistan is developing two nuclear-capable cruise missiles—the ground-launched Hatf-7, and the air-launched Hatf-8. The Pakistani government claims that both have stealth and "terrain-hugging" capabilities, as well as high accuracy and maneuverability.¹⁵⁰

¹³⁷ Ibid p. 4.

¹³⁸ Mateen Haider, "Pakistan Successfully Tests Ra'ad Cruise Missile: ISPR," *Dawn*, January 19, 2016, <http://www.dawn.com/news/1234015>.

¹³⁹ "Pakistan Inducts Chinese SHORAD Missile Systems" *Defense Update*, May 11, 2015, http://defense-update.com/20150511_pakistan-inducts-improved-shorad-missiles-acquired-from-china.html.

¹⁴⁰ Ibid.

¹⁴¹ Carlo Kopp and Martin Andrew, "Self Propelled Air Defense Systems," *Air Power Australia*, September 2010, <http://www.ausairpower.net/APA-HQ-7-Crotale.html>.

¹⁴² "Pakistan First Country to Start Negotiations with China for HQ-9, HQ-16 Missile Systems," *Indian Defense News*, April 2, 2015, <http://www.indiandefensenews.in/2015/04/pakistan-first-country-to-start.html>.

¹⁴³ "What is China's HQ-9 air defense system capable of?" <http://www.dw.com/en/what-is-chinas-hq-9-air-defense-system-capable-of/a-19053690>.

¹⁴⁴ "Hackathon of Another Kind: A 'Cyber War' Between India and Pakistan," *Business Standard*, September 28, 2015, http://www.business-standard.com/article/current-affairs/hackathon-of-another-kind-a-cyber-war-between-india-and-pakistan-115092800835_1.html

¹⁴⁵ "Senate Committee Proposes 7-Point Action Plan for Cyber Secure Pakistan," *Dawn*, July 12, 2013, <http://www.dawn.com/news/1023706>

¹⁴⁶ Hans Kristensen, "Pakistan's nuclear forces, 2015," p. 6.

¹⁴⁷ "Pak Test-Fires Nuclear Capable Ballistic Shaheen-1A Missile," *The Indian Express*, December 15, 2015, <http://indianexpress.com/article/world/world-news/pak-test-fires-nuclear-capable-ballistic-shaheen-1a-missile/>

¹⁴⁸ "Pakistan Test-Fires Nuclear-Capable Shaheen-III Ballistic Missile," *The Times of India*, December 11, 2015, <http://timesofindia.indiatimes.com/world/pakistan/Pakistan-test-fires-nuclear-capable-Shaheen-III-ballistic-missile/articleshow/50138704.cms>

¹⁴⁹ Hans Kristensen, "Pakistani nuclear forces, 2015," p. 6.

¹⁵⁰ Ibid.

The status of the Hatf-7 is unclear, as it was last tested in 2012.¹⁵¹ As noted above, the most recent test of the Hatf-8, in January 2016, was a success.¹⁵²

The Pakistan Air Force is upgrading its Mirage aircraft with aerial refueling equipment, which would extend their range.¹⁵³ In addition, Pakistan plans to use the JF-17 fighter, a joint Pakistan-China project, to replace its aging nuclear-capable Mirage IIIs and Mirage Vs.¹⁵⁴ Though the new aircraft will be equipped to deliver the Hatf-8 nuclear-capable air-launched cruise missile, Pakistani experts have indicated that there is uncertainty as to whether the JF-17 will have a nuclear strike role.

Reported efforts by Pakistan to pursue a submarine-launched ballistic missile (SLBM) capability are still in the early stages, though in 2012 Pakistan established a Naval Strategic Forces Command for deployment and management of a sea-based deterrent force.¹⁵⁵ Islamabad recently finalized a deal to purchase eight submarines from Beijing, four of which will be produced in Pakistan, and four in China.¹⁵⁶ Production could begin as early as 2016, but experts are still divided as to whether Pakistan's warhead technology would allow deployment of nuclear weapons on sea-launched weapons.¹⁵⁷ If Pakistan does eventually deploy a nuclear-armed submarine, a likely candidate for its armament is the Chinese CJ-10K nuclear-capable land attack cruise missile, which has a range of 1,500 km.¹⁵⁸ Pakistan is also reportedly likely to create a sea-launched ver-

sion of the Hatf-7 cruise missile,¹⁵⁹ which could be launched from a ship or submarine.¹⁶⁰

U.S. Nuclear Forces

The following provides an overview of the size, force structure, and modernization plans for U.S. nuclear forces. It also includes an account of nuclear-related capabilities, including missile defense, precision-guided conventional strike, space programs, and cyber capabilities.

Size of the force

As of March 2016, the U.S. nuclear stockpile consists of approximately 4,670 warheads. This number includes approximately 1,750 deployed strategic warheads (the New START deployed warhead number is lower, because deployed bombers are counted as only one warhead). The arsenal also includes 180 deployed nonstrategic warheads, and 2,740 reserve warheads.¹⁶¹ The U.S. arsenal is under the control of the United States Strategic Command, while the actual weapons and warheads are held by U.S. Air Force and the U.S. Navy.

The U.S. "triad" of nuclear delivery systems is comprised of Minuteman III intercontinental ballistic missiles (ICBMs), Trident II (D-5) ballistic missiles housed on Ohio-class ballistic missile submarines (SSBNs), and nuclear cruise missiles and gravity bombs carried by B-2 and B-52 nuclear-capable heavy bombers.¹⁶² The approximately 450 ICBMs,

¹⁵¹ Salman Masood, "Pakistan Says it Tests Nuclear-Capable Missile," *The New York Times*, June 5, 2012, <http://www.nytimes.com/2012/06/06/world/asia/pakistan-says-it-tested-nuclear-capable-missile.html>

¹⁵² "Pakistan Test-Fires Nuclear-Capable Babur Missile with 700km Range," *The Times of India*, September 17, 2012, <http://timesofindia.indiatimes.com/world/pakistan/Pakistan-test-fires-nuclear-capable-Babur-missile-with-700-km-range/articleshow/16432147.cms>

¹⁵³ Hans Kristensen, "Pakistani nuclear forces, 2015," p. 4.

¹⁵⁴ Dave Majumdar, "A 'Crash Landing': The Slow and Painful Death of India's Air Force," *The National Interest*, October 22, 2015, <http://nationalinterest.org/blog/the-buzz/crash-landing-the-slow-painful-death-indias-air-force-14149>.

¹⁵⁵ Hans Kristensen, "Pakistani nuclear forces, 2015," p. 9.

¹⁵⁶ Usman Ansari, "Pakistan, China Finalize 8-Sub Construction Plan," *Defense News*, October 11, 2015, <http://www.defensenews.com/story/defense/naval/submarines/2015/10/11/pakistan-china-finalize-8-sub-construction-plan/73634218/>.

¹⁵⁷ Franz Stefan-Gady, "Does Pakistan Have a Sea-Based Second-Strike Capability?" *The Diplomat*, March 13, 2015 <http://thediplomat.com/2015/03/does-pakistan-have-a-sea-based-second-strike-capability/>.

¹⁵⁸ Ibid.

¹⁵⁹ Usman Ansari, "Pakistan, China Finalize 8-Sub Construction Plan," *Defense News*, October 11, 2015, <http://www.defensenews.com/story/defense/naval/submarines/2015/10/11/pakistan-china-finalize-8-sub-construction-plan/73634218/>.

¹⁶⁰ CSIS Missile Threat, <https://missilethreat.csis.org/country/pakistan>.

¹⁶¹ Hans Kristensen and Robert Norris, "Status of World Nuclear Forces," *Federation of American Scientists*, <https://fas.org/issues/nuclear-weapons/status-world-nuclear-forces/>.

housed in silos in Montana, North Dakota, and Wyoming, are each armed with a single warhead.¹⁶³ The U.S. maintains 14 SSBNs, eight in the Pacific and six in the Atlantic,¹⁶⁴ 12 of which are operational at any given time.¹⁶⁵ Each could originally carry 24 Trident II missiles; under New START, the U.S. Navy is deactivating four missile tubes on each submarine. The submarines carry a total of approximately 1,000 warheads. U.S. nuclear-capable bombers (20 B-2 bombers and 76 B-52 bombers, are assigned approximately 500 warheads)¹⁶⁶ are based domestically. The around 180 U.S. non-strategic B61 gravity bombs are based at six installations in five European countries, but remain under the control of U.S. personnel.¹⁶⁷ U.S., Belgian, Dutch, German, Italian, and possibly Turkish air forces are tasked with nuclear strike missions using those weapons.¹⁶⁸

With 12 available SSBNs, the Navy maintains “continuous at-sea deterrence” with four to five submarines on station at any given time.¹⁶⁹ Over 60 percent of SSBN deterrent patrols occur in the Pacific.¹⁷⁰ Currently, each SSBN conducts two or three deterrent patrols each year, for a total of around 30 patrols. This is a decline of more than 50 percent from 1999, when SSBNs conducted 64 patrols.¹⁷¹

In recent years, the U.S. has chosen Andersen Air Force Base in Guam for a “continuous bomber presence” program that includes B-1,¹⁷² B-2,¹⁷³ and B-52¹⁷⁴ bombers. Unlike the B-2 and B-52, the B-1 can carry out only conventional missions.¹⁷⁵

Modernization plans

The U.S. is in the early stages of a 25-year nuclear forces modernization program that experts estimate will cost over \$700 billion.

Minuteman III ICBMs, which have been in service since 1970, have been receiving upgrades to their propellant, propulsion system, and reentry vehicle and are expected to remain deployed until 2030. A follow-on missile is slated to be developed at an estimated cost of \$62 billion, for deployment in 2030, and would be operationally deployed through 2070.¹⁷⁶ There is a small possibility that cost considerations would lead the U.S. Air Force to again extend the life of the Minuteman III, which an Air Force-funded RAND study said was a considerably cheaper option.¹⁷⁷

The SSBN(X) program is intended to replace the Ohio-class SSBNs, with the first boat entering service in 2031. The estimated lifecycle cost of the pro-

¹⁶² Amy Woolf, “U.S. Strategic Nuclear Forces: Background, Developments and Issues,” September 27, 2016, <https://www.fas.org/sgp/crs/nuke/RL33640.pdf>.

¹⁶³ Eryn Macdonald, “The End of MIRVs for U.S. ICBMs,” June 27, 2014, <http://allthingsnuclear.org/emaacdonald/the-end-of-mirvs-for-u-s-icbms>.

¹⁶⁴ Department of the Navy, “Fleet Ballistic Missile Submarines –SSBN,” http://www.navy.mil/navydata/fact_display.asp?cid=4100&ctid=200&ct=4.

¹⁶⁵ Hans Kristensen, “U.S. nuclear forces, 2015,” *Bulletin of the Atomic Scientists*, 2015, p. 113, <http://bos.sagepub.com/content/71/2/107.full.pdf+html>.

¹⁶⁶ Amy Woolf, “U.S. Strategic Nuclear Forces: Background, Developments and Issues,” September 27, 2016, pg.8, <https://www.fas.org/sgp/crs/nuke/RL33640.pdf>.

¹⁶⁷ Hans Kristensen, “U.S. nuclear forces, 2015,” p. 116.

¹⁶⁸ Amy Woolf, “Nonstrategic Nuclear Weapons,” *CRS*, February 23, 2015, p18, <https://www.fas.org/sgp/crs/nuke/RL32572.pdf>.

¹⁶⁹ Amy Woolf, “U.S. Strategic Nuclear Forces: Background, Developments, and Issues,” November 3, 2015, p26 <https://www.fas.org/sgp/crs/nuke/RL33640.pdf>.

¹⁷⁰ Hans Kristensen, “U.S. nuclear forces, 2015,” p. 114.

¹⁷¹ Hans Kristensen, “Declining Deterrent Patrols Indicate Too Many SSBNs,” April 30, 2013, <https://fas.org/blogs/security/2013/04/ssbnpatrols/>.

¹⁷² William Cole, “Fighter Jets Will Be Sent to Guam as Russia Gets Provocative,” January 12, 2016, <http://www.military.com/daily-news/2016/01/12/fighter-jets-will-be-sent-guam-russia-gets-provocative.html>.

¹⁷³ Bill Gertz, “U.S. Deploys Three B-2 Bombers to Guam Amid Korea Tensions,” *The Washington Free Beacon*, August 25, 2015, <http://freebeacon.com/national-security/u-s-deploys-three-b-2-bombers-to-guam-amid-korea-tensions/>.

¹⁷⁴ Luis Martinez, “U.S. B-52 Flyover of South Korea in Response to North Korean Nuclear Test,” *ABC News*, January 9, 2016, <http://abcnews.go.com/International/us-52-flyover-south-korea-response-north-korean/story?id=36192658>.

¹⁷⁵ “B-1B Lancer Long-Range Strategic Bomber, United States of America,” <http://www.airforce-technology.com/projects/b-1b/>.

¹⁷⁶ Kingston Reif, “U.S. Nuclear Modernization Programs,” December 2016, <http://www.armscontrol.org/factsheets/USNuclearModernization>.

¹⁷⁷ Stephen Young, “The End of the New ICBM,” *Defense One*, February 18, 2014, <http://www.defenseone.com/technology/2014/02/end-new-icbm/78986/>.

gram is \$347 billion for a total of 12 boats.¹⁷⁸ Twelve new SSBNs will replace 14 Ohio-class SSBNs, because the new SSBNs will have a reactor that does not require a lengthy refueling process. The Navy is currently working to upgrade its Trident II D5 missiles, which are expected to last until 2042.

The new LRS-B/B-21 bomber program will replace the B-1 and B-52 bombers, at an estimated cost of \$41.7 billion through 2024. Planned upgrades to the strategic bomber force will also include modernization of the B61 gravity bomb for the B-2. The B61 will become the sole strategic or tactical gravity bomb in the U.S. arsenal. The Pentagon is also developing a Long-Range Standoff Cruise Missile (LRSO) for the B-52, and possibly the Long Range Strike Bomber (LRS-B).¹⁷⁹

U.S. tactical nuclear weapons, once deployed in Asia, are no longer stationed in the region. The U.S. unilaterally removed the last of its nuclear artillery shells and B61 bombs from Korea in 1991.¹⁸⁰ The TLAM-N nuclear cruise missile, once deployed on Navy surface ships and attack submarines, was removed to storage in the early 1990s, and the warheads were retired in 2013, meaning that the Navy no longer possesses a sea-based tactical nuclear weapon.¹⁸¹ The United States is in the midst of a 12-year, \$8 billion program to extend the life of its B61 nuclear gravity bombs by consolidating existing B61 types into a new variant, the B61-12.¹⁸² U.S. officials have emphasized the importance of retain-

ing the ability to forward-deploy nuclear weapons to fulfill obligations to NATO and in the case of “regional contingencies.”¹⁸³

Nuclear-related capabilities

U.S. missile defenses currently consist of a ground-based midcourse defense element deployed in Alaska and California, which was designed to defend against a limited ballistic missile attack by Iran or North Korea, and theater defense systems such as Terminal High Altitude Area Defense (THAAD), the Aegis BMD system, and the Patriot PAC-3, which are intended to counter short to intermediate-range ballistic missiles.

Japan and Taiwan already possess PAC-3 missile defense batteries, and South Korea has recently contracted Lockheed Martin to supply PAC-3 interceptors and launchers for its air and missile defense forces.¹⁸⁴ Washington and Seoul recently announced formalization of talks regarding deployment of THAAD on South Korean territory.¹⁸⁵ Japan¹⁸⁶ is reportedly also considering purchasing THAAD systems, and is seeking to acquire the Aegis Ashore BMD system for deployment on its territory.¹⁸⁷

According to official documents and statements, the U.S. Conventional Prompt Global Strike (CPGS) could be used to destroy or disable an adversary’s anti-satellite capabilities or for defense suppression, such as countering anti-access/area-denial capabilities.

¹⁷⁸ Kingston Reif, “U.S. Nuclear Modernization Programs,” December 2016, <http://www.armscontrol.org/factsheets/USNuclearModernization>.

¹⁷⁹ Kingston Reif, “U.S. Nuclear Modernization Programs,” December 2016, <http://www.armscontrol.org/factsheets/USNuclearModernization>.

¹⁸⁰ Kelsey Davenport, “Chronology of U.S.- North Korean Nuclear and Missile Diplomacy,” October 2016, <https://www.armscontrol.org/factsheets/dprkchron>.

¹⁸¹ Hans Kristensen, “US Navy Instruction Confirms Retirement of Nuclear Tomahawk Cruise Missile,” March 18, 2013 <https://fas.org/blogs/security/2013/03/tomahawk/>.

¹⁸² “B61,” <http://www.globalsecurity.org/wmd/systems/b61.htm>.

¹⁸³ Amy Woolf, “Nonstrategic Nuclear Weapons,” p16.

¹⁸⁴ Jen Judson, “On Heels of Successful Tests, Lockheed Wins \$1 Billion in PAC-3 Sales,” *Defense News*, December 14, 2015, <http://www.defensenews.com/story/defense/policy-budget/industry/2015/12/14/heels-successful-tests-lockheed-wins-1-billion-pac-3-sales/77319320/>.

¹⁸⁵ Anna Fifield, “South Korea, U.S., To Start Talks on Anti-Missile System,” *The Washington Post*, February 7, 2016, https://www.washingtonpost.com/world/south-korea-united-states-to-start-talks-on-thaad-anti-missile-system/2016/02/07/1eaf2df8-9dc4-45e3-8ff1-d76a25673dbe_story.html.

¹⁸⁶ Andy Sharp, “Japan Mulls Thaad Missile Defense System Amid North Korea Threat,” *Bloomberg*, November 24, 2015, <http://www.bloomberg.com/news/articles/2015-11-24/japan-mulls-thaad-missile-defense-system-amid-north-korea-threat>.

¹⁸⁷ Megan Eckstein, “House Paves the Way for Japan to Buy Aegis Ashore; Adds Anti-Air Warfare to European Sites,” USNI News, May 18, 2015, <http://news.usni.org/2015/05/18/house-paves-the-way-for-japan-to-buy-aegis-ashore-adds-anti-air-warfare-to-european-sites>.

The United States is also developing space capabilities, including systems that could potentially have anti-satellite (ASAT) capabilities. The current vanguard is the Aegis BMD system and its SM-3 Block IIA interceptor, jointly developed by the United States and Japan. The missile was successfully flight-tested in 2015 and is on track for deployment on sea and land in 2018. It is intended to defeat medium and intermediate-range ballistic missiles,¹⁸⁸ but it is also estimated that the SM-3 Block IIA will offer a robust, if latent, ASAT capability.¹⁸⁹

The U.S. is also pursuing cyber weapons that are intended for deterrent effect. National Security

Agency Director Admiral Mike Rogers has said that policymakers have reached a general consensus about defensive use of those weapons, and are now at a “tipping point” regarding deployment of cyber capabilities for “broader” applications.¹⁹⁰ Agreement on offensive use of cyber weapons has proven more elusive, but the U.S. is developing such weapons.¹⁹¹ While American offensive cyber war capabilities are not discussed publically, U.S. officials have acknowledged that the U.S. nuclear deterrent has not been adequately assessed for vulnerability to cyber-attack.¹⁹²

¹⁸⁸ Raytheon, “SM-3 Interceptor,” <http://www.raytheon.com/capabilities/products/sm-3/>.

¹⁸⁹ Laura Grego, “Aegis as ASAT,” April 26, 2012, <http://allthingsnuclear.org/lgrego/aegis-as-asat>.

¹⁹⁰ Damian Paletta, “NSA Chief Says U.S. at ‘Tipping Point’ on Cyberweapons,” *The Wall Street Journal*, January 21, 2016, <http://www.wsj.com/articles/nsa-chief-says-u-s-at-tipping-point-on-cyberweapons-1453404976>.

¹⁹¹ Danny Vinik, “America’s Secret Arsenal,” POLITICO, December 9, 2015, <http://www.politico.com/agenda/story/2015/12/defense-department-cyber-offense-strategy-000331>.

¹⁹² Samantha Pitz, “Cyber Vulnerabilities of Nuclear Weapons Are a Real National Security Threat,” June 30, 2015, <http://nukesofhazardblog.com/cyber-vulnerabilities-of-nuclear-weapons-are-a-real-national-security-threat/>.

Annex F. Background: Existing Measures to Promote Stability in the “Strategic Chain”

Prepared by James Tyson, Strategic Chain Project Coordinator, Brookings Institution

The countries of the “Strategic Chain” have undertaken some measures to promote strategic stability and reduce strategic uncertainty. These include declarations, memorandums of understanding (MOUs), confidence- and security-building measures (CSBMs), and strategic dialogues. In addition, they are also signatories to several international agreements and arrangements that contribute to strategic stability. The following paper provides a brief summary of those measures—multilateral, bilateral, and unilateral, as well as informal and formal—which are relevant to the “Strategic Chain.” It also provides a brief overview of the policies of the countries regarding the potential use of nuclear weapons.

Multilateral Measures

Proposed Fissile Material Cut-off Treaty (FMCT)

China, India, Pakistan, and the United States have all indicated that they support a treaty limiting fissile materials. The U.S., India, and China support a treaty that would ban new production of fissile material for nuclear weapons, but not existing stocks of material. Pakistan’s former ambassador to the Conference on Disarmament Zamir Akram said in 2014 that while Pakistan does not oppose negotiating a

treaty on fissile material it does not support “negotiating a treaty that only aims at a cut-off in future production of fissile material, without addressing existing stockpiles,” and has been unprepared to allow consensus discussions on such a treaty.¹⁹³

Comprehensive Nuclear-Test-Ban Treaty (CTBT)

China and the U.S. signed the CTBT in 1996, but neither has ratified the treaty.¹⁹⁴ The U.S. announced a unilateral moratorium on testing in 1992, just after its last nuclear test.¹⁹⁵ China tested a nuclear device in July 1996, and declared a unilateral moratorium on testing immediately afterwards.¹⁹⁶ India and Pakistan have not signed the CTBT, but they declared and have maintained unilateral moratoria on testing since their last tests in May 1998.¹⁹⁷

Missile Technology Control Regime (MTCR)

Of the four countries the U.S. is a founder member of the MTCR, having helped establish it in 1987. In 1992, China committed itself to abiding by MTCR guidelines.¹⁹⁸ It applied for membership in 2004, but there is no consensus on allowing China to join. India voluntarily agreed to follow MTCR guidelines in 2008 and applied for full membership in 2015. After winning consensus of all MTCR members India formally joined the regime in June 2016.¹⁹⁹

Nuclear Suppliers Group (NSG)

The U.S. is a founding member of the NSG since 1975, and China joined in 2004. India has expressed interest in joining the NSG since 2005, but has not been admitted. Pakistan also subsequently expressed

¹⁹³ “Statement by Ambassador Zamir Akram,” Pakistan Permanent Mission to the United Nations, June 4, 2014, p. 2, <http://fissilematerials.org/library/pk14a.pdf>.

¹⁹⁴ “The Status of the Comprehensive Test Ban Treaty: Signatories and Ratifiers,” Arms Control Association, March 2015, <https://www.armscontrol.org/factsheets/ctbtsig>.

¹⁹⁵ “Not Going Back: 20 Years Since the Last U.S. Nuclear Test,” The Arms Control Association, September 20, 2012, <https://www.armscontrol.org/issuebriefs/No-Going-Back-20-Years-Since-the-Last-US-Nuclear-Test%20>; “Nuclear Disarmament United States,” Nuclear Threat Initiative, June 18, 2015, <http://www.nti.org/analysis/articles/united-states-nuclear-disarmament/>.

¹⁹⁶ Seth Faison, “China Sets Off Nuclear Test, Then Announces Moratorium,” *The New York Times*, July 30, 1996, <http://www.nytimes.com/1996/07/30/world/china-sets-off-nuclear-test-then-announces-moratorium.html>.

¹⁹⁷ “Pakistan Announces Testing Moratorium, Seeks Talks With India,” *Tribune News Services*, June 12, 1998, http://articles.chicagotribune.com/1998-06-12/news/9806120113_1_nuclear-escalation-india-and-pakistan-test-ban.

¹⁹⁸ Jack Mendelsohn, David Grahame, “Arms Control Chronology,” Carnegie Endowment for International Peace, Winter 2002, p. 67, <http://carnegieendowment.org/pdf/npp/acc.pdf>.

¹⁹⁹ Kallol Bhattacharjee, “India Joins Missile Technology Control Regime. Top 5 Things to Know,” *The Hindu*, 27 June 2016, <http://www.thehindu.com/news/national/%E2%80%8BIndia-joins-Missile-Technology-Control-Regime.-Top-5-things-to-know/article14405165.ece> and Kelsey Davenport, “India Joins Ballistic Missile Initiative,” *Arms Control Today*, July/August 2016, https://www.armscontrol.org/ACT/2016_07/News/India-Joins-Ballistic-Missile-Initiatives.

interest in joining the NSG.²⁰⁰

Other Multilateral Agreements

China, India, Pakistan and the U.S. are also signatories to several other international agreements related to weapons of mass destruction. The status of their memberships is listed in the table below.

Bilateral Measures

China-India

Border Defense Cooperation Agreement: Signed in October 2013, it aims to establish “mutual security” through pledges by each side not to use or threaten to use force against the other;²⁰¹ includes mechanisms for information sharing, joint disaster relief efforts, conflict resolution, and high-level military-to-military contact.

Annual Defense Dialogue: Began in 2007, it has a

		China	India	Pakistan	U.S.
2016	Convention on the Physical Protection of Nuclear Material (CPPNM) (with the 2005 Amendment)	X	X	X	X
2007	International Convention on the Suppression of Acts of Nuclear Terrorism	X	X		X
2002	The Hague Code of Conduct against Ballistic Missile Proliferation (HCOOC)		X		X
2001	Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management	X			X
1997	Chemical Weapons Convention (CWC)	X	X	X	X
1996	Comprehensive Test Ban Treaty	X			X
1996	Convention on Nuclear Safety	X	X	X	X
1996	Wassenaar Arrangement				X
1987	Missile Technology Control Regime		X		X
1985	Australia Group				X
1976	Convention on Registration of Objects Launched into Outer Space	X	X	X	X
1974	Nuclear Suppliers Group	X			X
1975	Biological Weapons Convention (BWC)	X	X	X	X
1972	Seabed Treaty	X			
1971	Zangger Committee	X			X
1970	Treaty on the Non-Proliferation of Nuclear Weapons (NPT)	X			X
1967	Outer Space Treaty	X	X	X	X
1963	Treaty Banning Nuclear Tests in the Atmosphere, in Outer Space and Under Water (Partial Test Ban Treaty) (PTBT)		X	X	X
1961	Antarctic Treaty	X	X	X	X
1925	Geneva Protocol	X	X	X	X

²⁰⁰ Daniel Horner, “Pakistan, U.S. Said to Be Talking on NSG,” Arms Control Association, November 2015, https://www.armscontrol.org/ACT/2015_11/News/Pakistan-US-Said-to-Be-Talking-on-NSG.

²⁰¹ “Border Defense Cooperation Agreement between India and China,” Press Information Bureau, Government of India, Prime Minister’s Office, October 23, 2013, <http://pib.nic.in/newsite/PrintRelease.aspx?relid=100178>.

broad agenda focused on strategic issues. The latest meetings were held in 2015.²⁰²

Hand-in-Hand Military Exercises: MOU signed in 2006 and exercises began in 2007 in China; it provides for military-to-military contact and joint exercises in counter-terrorism, anti-piracy, and search and rescue; it also includes high-level military engagement.²⁰³ Most recent exercises were held in 2015.²⁰⁴

Joint Declaration by the Republic of India and the People's Republic of China: Adopted in November 2006, it commits both to future discussions on WMD and proliferation.²⁰⁵

Agreement on Confidence-Building Measures in the Military Field: Adopted in November 1996, it commits both countries to notify each other of military exercises, and also provided for some observation of troop movements by both sides.²⁰⁶ It also calls for major categories of armaments to be reduced, or limited, “in mutually agreed geographical zones along the line of actual control to ceilings to be mutually agreed upon” including “surface-to-surface missiles.”

Agreement on Maintaining Peace and Stability in the Region in the Vicinity of the Actual Control Line: Signed in September 1993, aims to avoid use of force on the contested border by limiting troop buildup,

providing advance notification of exercises, and respecting the actual line of control.²⁰⁷

China-Pakistan

Defense Cooperation Agreement: Signed in 2008, it further strengthens defense cooperation between the Pakistani and Chinese militaries in further pursuit of joint strategic goals.²⁰⁸

Agreement on Cooperation in the Nuclear Field: Signed in 1986, it provides for transfer of nuclear technology including reactor design; cooperation is ongoing.²⁰⁹

Agreement on Scientific and Technical Cooperation: Signed in 1976, it provided for close cooperation on a broad range of issues, including atomic energy.²¹⁰

China-U.S.

U.S.-China Space Hotline: Established in November 2015, to allow for notification of potential approaches or collisions in space, and space-based tests.²¹¹

Agreements on Cybersecurity: Agreed upon in 2015, during heads-of-state meeting. China and the U.S. will consult, share information on malicious cyber activities, refrain from conducting or knowingly supporting cyber-enabled theft of intellectual property, promote appropriate norms of state behavior in

²⁰² “7th Annual Defense and Security Dialogue between India and China held in Beijing,” Embassy of India, Beijing, April 10, 2015, <http://www.indianembassy.org.cn/newsDetails.aspx?NewsId=595>.

²⁰³ Jagannath P. Panda, “China-India Joint Military Drill: Time for a Review,” Institute for Defense Studies and Analyses, September 2, 2013, http://www.idsa.in/idsacomments/ChinaIndiaJointMilitaryDrill_jppanda_020913.

²⁰⁴ Franz-Stefan Gady, “China and India Hold Joint Military Exercise,” The Diplomat, October 12, 2015, <http://thediplomat.com/2015/10/china-and-india-hold-joint-military-exercise/>.

²⁰⁵ “Joint Declaration by the Republic of India and the People’s Republic of China,” Ministry of External Affairs, Government of India, November 21, 2006, <http://www.mea.gov.in/bilateral-documents.htm?dtl/6363/Joint+Declaration+by+the+Republic+of+India+an>.

²⁰⁶ “Agreement between India and China on Confidence-Building Measures in the Military Field along the Line of Actual Control in the India-China Border Areas,” *United Nations Peacemaker*, November 29, 1996, <http://peacemaker.un.org/chinaindiaconfidenceagreement96>.

²⁰⁷ “Agreement on the Maintenance of Peace and Tranquility along the Line of Actual Control in the India-China Border Areas,” *United Nations Peacemaker*, September 7, 1993, <http://peacemaker.un.org/chinaindia-borderagreement93>.

²⁰⁸ “Pakistan, China agree to further strengthen defense cooperation,” Embassy of the People’s Republic of China in Pakistan, September 28, 2008, <http://www.fmprc.gov.cn/ce/cepks/eng/xnyfgk/t515498.htm>.

²⁰⁹ “Sino-Pak Nuclear Accord,” *Pakistan Horizon*, 1986, <http://www.jstor.org/stable/41394229> and “Nuclear Power in Pakistan,” World Nuclear Association, April 2016, <http://www.world-nuclear.org/information-library/country-profiles/countries-o-s/pakistan.aspx>.

²¹⁰ “Scientific and Technical Cooperation Between China and Pakistan,” Embassy of the People’s Republic of China in Pakistan, March 23, 2013, <http://pk.chineseembassy.org/eng/scientechcooperation/t191006.htm>.

²¹¹ Jamie Condliffe, “The U.S. Now Has a Space Hotline With China,” Gizmodo, November 23, 2015, <http://gizmodo.com/the-u-s-now-has-a-space-hotline-with-china-1744153537>.

cyberspace, and establish a high-level joint dialogue on fighting cybercrime and related issues.²¹²

MOU on Rules of Behavior for Safety of Air and Maritime Encounters: Signed in 2014, the MOU includes codes of conduct for sea-to-sea and air-to-air encounters, including annual assessments, exchange of information regarding issues that arise during encounters, and ad-hoc consultations on questions regarding encounters.²¹³

MOU on Notification of Major Military Activities: Signed in 2014, the MOU provides for exchange of information regarding major military exercises and observation of those exercises, as well as information on defense strategy and policies via briefings and publications. It also provides a formal channel for meetings and discussions of substantive defense information.²¹⁴

U.S.–China Military Hotline: Established in November 2007, it aims to help the countries “avoid misunderstanding during moments of crisis.”²¹⁵

U.S.–China Nuclear Hotline: Established in April 1998, the hotline aims to provide a dedicated channel between the governments of the two countries.

Nuclear cooperation agreement: Entered into force in

1985, the countries agreed to permit implementation in 1997.²¹⁶

India-Pakistan

Agreement on Reducing the Risk from Accidents Relating to Nuclear Weapons: Signed in 2007 and extended for an additional 5 years in 2012. Both sides agreed to take measures to improve the security of their nuclear weapons and notify each other of nuclear accidents. Should an accident occur, both sides commit to work to prevent their actions from being misinterpreted.²¹⁷

Agreement on Pre-Notification of Flight Testing of Ballistic Missiles: Signed in November 2005, it provides for 72 hours advance notice of ballistic missile flight tests, and also sets clear geographic boundaries and trajectory limitations for those tests.²¹⁸

Expert-level talks on nuclear CBMs: Beginning in December 2004 the talks are held periodically and focus on promoting strategic stability and reducing nuclear risk. The latest talks were held in 2012.²¹⁹

India-Pakistan Nuclear Hotline: Established in June 2004, the hotline between the Pakistan and India foreign ministries aims to “reduce the threat of accidental nuclear war.”²²⁰

²¹² John Rollins, “U.S.–China Cyber Agreement,” *Congressional Research Service*, October 16, 2015, p. 1, <https://www.fas.org/sgp/crs/row/IN10376.pdf>; “FACT SHEET: President Xi Jinping’s State Visit to the United States,” White House Office of the Press Secretary, September 25, 2015, <https://www.whitehouse.gov/the-press-office/2015/09/25/fact-sheet-president-xi-jinpings-state-visit-united-states>.

²¹³ “Memorandum of Understanding Regarding the Rules of Behavior for Safety of Air and Maritime Encounters,” *Department of Defense*, November 10, 2014, pp. 1-3, http://www.defense.gov/Portals/1/Documents/pubs/141112_MemorandumOfUnderstandingRegardingRules.pdf.

²¹⁴ “Memorandum of Understanding on Notification of Major Military Activities Confidence-Building Measures Mechanism,” U.S. Department of Defense, November 4, 2014, pp. 5, 7-8, http://www.defense.gov/Portals/1/Documents/pubs/141112_MemorandumOfUnderstandingOnNotification.pdf.

²¹⁵ Edward Cody, “China and U.S. To Establish Military Hotline,” *Washington Post*, November 6, 2007, <http://www.washingtonpost.com/wp-dyn/content/article/2007/11/05/AR2007110500102.html>.

²¹⁶ Jack Mendelsohn, David Grahame, “Arms Control Chronology,” p. 65.

²¹⁷ “India and Pakistan extend agreement on Reducing the Risk from Accidents Relating to Nuclear Weapons,” Ministry of External Affairs, Government of India, February 21, 2012, <http://mea.gov.in/press-releases.htm?dtl/18860/India+and+Pakistan+extend+agreement+on+Reducing+the+Risk+from+Accidents+Relating+to+Nuclear+Weapons>; Baqir Sajjad Syed “Accord on reducing risk of nuclear accidents extended,” *Dawn*, February 22, 2012, <http://www.dawn.com/news/697322/accord-on-reducing-risk-of-nuclear-accidents-extended>.

²¹⁸ Erin Creegan, “India, Pakistan Sign Missile Notification Pact,” *Arms Control Today*, November 1, 2005, https://www.armscontrol.org/act/2005_11/NOV-IndiaPak.

²¹⁹ “Joint Statement, India-Pakistan Expert-Level Talks on Nuclear CBMs,” Ministry of External Affairs, Government of India, June 20, 2004, http://www.nti.org/media/pdfs/26_ea_india.pdf?_id=1316627913; “India, Pakistan hold talks on Nuclear Confidence Building Measures in Islamabad,” *ANI News*, December 27, 2012, <https://in.news.yahoo.com/india-pakistan-hold-talks-nuclear-confidence-building-measures-143048619.html>.

²²⁰ John Lancaster, “India, Pakistan to Set Up Hotline,” *Washington Post*, June 21, 2004, <http://www.washingtonpost.com/wp-dyn/articles/A55542-2004Jun20.html>.

Missile Test Notification Agreement: Established in January 2004, agreed to a formal mechanism for notification regarding missile flight tests.²²¹

Lahore Declaration: Signed in February 1999. Both sides pledged to hold talks on nuclear concepts and doctrines in an effort to prevent conflict, and also to immediately take steps to reduce the risk of accidental or unauthorized nuclear use.²²²

Prime Ministers' Hotline: Established in 1997, for the purpose of crisis management.²²³

Pakistan-India Composite Dialogue Process: Inaugurated in 1997, at the ministerial level; designed to move the two countries towards reconciliation on all issues, includes discussion of strategic issues and CBMs.²²⁴

Joint Declaration on the Complete Prohibition of Chemical Weapons: Concluded in New Delhi in 1992, it prohibits India and Pakistan from developing, producing, otherwise acquiring or using chemical weapons, or rendering assistance to those who would do so.²²⁵

Agreement on Prevention of Air Space Violations: Ratified in August 1992, it stipulates that Indian and Pakistani combat aircraft will not fly within ten kilometers of each other's airspace, while establishing a mechanism for prior permission for overflights.²²⁶

Agreement on Advance Notice on Military Exercises, Manoeuvres and Troop Movements: Signed in 1991, it establishes deadlines for advanced notice of military exercises and troop movements to prevent misunderstanding and crisis.

India-Pakistan Non-Attack Agreement: Signed in January 1988. Both sides agree to refrain from undertaking any action aimed at causing destruction or damage to any nuclear installation or facility in each country. The Agreement also provides for annual exchange of information on number and location of nuclear sites in each country.²²⁷

India-U.S.

U.S.-India Hotline: Established in 2015 between heads of state and national security advisors, not necessarily as a crisis management venue, but to "co-ordinate approaches to solving real problems."²²⁸

U.S.-India Strategic and Commercial Dialogue: Begun in 2015, it aims to further cooperation on strategic objectives including nuclear nonproliferation, regional security, cyber issues, and space security.²²⁹

U.S.-India Strategic Security Dialogue: Inaugurated in 2010, it is meant to foster strategic cooperation on a broad range of issues, including nuclear and defense issues, regional security, arms control and non-proliferation.²³⁰ The most recent meeting was held in 2016.

²²¹ "India, Pakistan Agree on Missile Test Notification," Nuclear Threat Initiative, June 28, 2004, <http://www.nti.org/gsn/article/india-pakistan-agree-on-missile-test-notification/>.

²²² "Lahore Declaration," Nuclear Threat Initiative, <http://www.nti.org/learn/treaties-and-regimes/lahore-declaration/>.

²²³ Institute for Defense and Disarmament Studies, "South Asia: India, Pakistan," 2005, <http://www.idds.org/issNucProlifSAsia.html>.

²²⁴ Sajad Padder, "The Composite Dialogue between India and Pakistan: Structure, Process and Agency," Heidelberg University, February 2012, p. 2, http://archiv.ub.uni-heidelberg.de/volltextserver/13143/1/Heidelberg_Papers_65_Padder.pdf.

²²⁵ "Joint Declaration on the Complete Prohibition of Chemical Weapons," August 19, 1992, <http://fas.org/nuke/guide/india/doctrine/chem.htm>.

²²⁶ "Agreement on prevention of air space violations and for permitting over flights and landings by military aircraft," Governments of India and Pakistan, April 6, 1991, <https://treaties.un.org/doc/publication/unts/volume%201843/volume-1843-i-31419-english.pdf>.

²²⁷ "India-Pakistan Non-Attack Agreement," Governments of India and Pakistan, December 1, 1988, http://www.nti.org/media/pdfs/aptindpak.pdf?_id=1316555923.

²²⁸ "Modi-Obama hotline becomes operational," Times of India, August 21, 2015, <http://timesofindia.indiatimes.com/world/us/Modi-Obama-hotline-becomes-operational/articleshow/48568491.cms>.

²²⁹ "Joint Statement on the First U.S.-India Strategic and Commercial Dialogue," U.S. Department of State, September 22, 2015, <http://www.state.gov/r/pa/prs/ps/2015/09/247192.htm>.

²³⁰ "U.S.-India Strategic Dialogue Joint Statement," U.S. Department of State, June 3, 2010, <http://www.state.gov/r/pa/prs/ps/2010/06/142645.htm>.

Nuclear cooperation agreement: Signed in 2008, the U.S.-India 123 agreement provides for full civil nuclear cooperation between the two countries. India accepted IAEA safeguards as part of the agreement.²³¹

Pakistan-U.S.

U.S.-Pakistan Strategic Dialogue: Inaugurated in 2009, as a framework for annual ministerial level talks. It has a broad agenda, which includes nuclear weapons and strategic issues;²³² it also includes a Pakistan-U.S. Security, Strategic Stability, and Non-proliferation (SSS&NP) Working Group.²³³ The most recent meetings were held in 2016.²³⁴

Policies on the Potential Use of Nuclear Weapons

China

Beijing adopted a unilateral no first use (NFU) policy in 1964, and reiterated in its 2015 Defense White Paper that it would strike with nuclear weapons only in response to a nuclear attack on China.²³⁵ “The Science of Military Strategy,” a 2013 publication of the Chinese Academy of Military Sciences, presents the following specific criteria for nuclear use. “1. China will not use nuclear weapons to attack or threaten non-nuclear states; 2. China will not use nuclear weapons to respond to conventional attacks; and 3. China will use nuclear weapons only after it has confirmed an incoming nuclear attack.”²³⁶

“The Science of Military Strategy” also sets out three operational rules for China’s nuclear second-strike capability. First, a retaliatory attack by China would be limited, partially to allow for additional retaliatory strikes. Second, a retaliatory attack would target population centers, and not military capabilities. Third, China’s objective in launching a retaliatory strike would be to compel an adversary to abandon future plans to attack China with nuclear weapons.²³⁷

Though China’s nuclear arsenal is under the operational control of the People’s Liberation Army via its General Staff Directorate (GSD), experts believe that final release authority rests with the Central Military Commission and its chairman—a position usually held by the General Secretary of the Chinese Communist Party (CCP), currently President Xi Jinping.²³⁸

India

The most recent official document outlining India’s nuclear posture, released by New Delhi in 2003, reaffirms India’s unilateral NFU policy, announced in 1999 in its first draft nuclear doctrine.²³⁹ It states that India will only use its nuclear weapons to retaliate against a nuclear attack on India or against Indian forces wherever they are deployed, with the possible exception of a “major attack” with chemical or biological weapons, in which case India retains the option of a nuclear response.²⁴⁰

²³¹ “Agreement for Cooperation Concerning Peaceful Uses of Nuclear Energy (123 Agreement),” Governments of India and the United States, August 2007, <http://www.cfr.org/india/agreement-cooperation-between-government-united-states-america-government-india-concerning-peaceful-uses-nuclear-energy-123-agreement/p15459>.

²³² Michael Kugelman, “Salvaging a Troubled Marriage: Lessons for U.S.-Pakistan Relations,” Wilson Center, November 2012, https://www.wilsoncenter.org/sites/default/files/policy_brief_us_pakistan_relations.pdf.

²³³ “Pakistan and United States Discuss Security, Strategic Stability, and Nonproliferation Issues,” U.S. Department of State, November 21, 2013, <http://www.state.gov/r/pa/prs/ps/2013/11/217918.htm>.

²³⁴ Anwar Iqbal, “Differences on nuclear issue surface at US strategic talks,” *Dawn*, March 1, 2016, <http://www.dawn.com/news/1242736>.

²³⁵ Alexei Arbatov, “Engaging China in Arms Control,” Carnegie Endowment for International Peace, October 2014, p. 4, http://carnegieendowment.org/files/Arbatov_China_nuclear_Eng2014.pdf; Gregory Kulacki, “China’s Nuclear Threshold and No First-Use,” *Union of Concerned Scientists*, September 24, 2014, <http://allthingsnuclear.org/gkulacki/chinas-nuclear-threshold-and-no-first-use>; Jack Mendelsohn, David Grahame, “Arms Control Chronology,” p. 28.

²³⁶ Gregory Kulacki, “The Chinese Military Updates China’s Nuclear Strategy,” *Union of Concerned Scientists*, March 2015, p. 2, <http://www.ucsusa.org/sites/default/files/attach/2015/03/chinese-nuclear-strategy-full-report.pdf>.

²³⁷ *Ibid.*

²³⁸ Lyle Goldstein, Andrew Erickson, “China’s Nuclear Force Modernization,” U.S. Naval War College, 2005, pp. 13-14 <https://www.usnwc.edu/Publications/Naval-War-College-Press/-Newport-Papers/Documents/22-pdf.aspx>.

²³⁹ “India,” Nuclear Threat Initiative, March 2016, <http://www.nti.org/learn/countries/india/nuclear/>.

²⁴⁰ “Cabinet Committee on Security Reviews Process in Operationalizing India’s Nuclear Doctrine,” Press Information Bureau, Government of India, Prime Minister’s Office, January 4, 2003, <http://pib.nic.in/archieve/releng/lyr2003/rjan2003/04012003/r040120033.html>.

In its 2003 document, New Delhi stressed that India will maintain a “credible minimum deterrent,” which it defines as the ability to retaliate to a first strike with a massive retaliatory response designed to “inflict unacceptable damage.”²⁴¹

India’s nuclear arsenal is under military stewardship via its Strategic Forces Command. However, the country’s nuclear policy is formulated by its Nuclear Command Authority, which is comprised of a decision-making body, the Political Council, and an implementation body, the Executive Council.²⁴² The decision to launch a nuclear strike can only be made by the Political Council, which is chaired by the prime minister.²⁴³

Pakistan

Islamabad has not released a nuclear doctrine or guidelines for possible nuclear use. However, the Pakistani concept of deterrence is focused on discouraging Indian aggression in conventional as well as nuclear domains.²⁴⁴ In 1999, Foreign Minister Abdul Sattar said “Minimum nuclear deterrence will remain the guiding principle of our nuclear strategy. The minimum cannot be quantified in static numbers...But we shall not engage in any nuclear competition or arms race.”²⁴⁵

In its official statements, Islamabad has left open the possibility of nuclear first-use against nuclear-armed states. It has avoided publicizing its “red lines” for nuclear use, ostensibly to create strategic doubt in New Delhi regarding the consequences of launching a con-

ventional or nuclear attack.²⁴⁶ In 2015, Defense Minister Khawaja Asif expressed a readiness to use nuclear weapons if the survival of the state is at stake.²⁴⁷

During the 2001-2002 military standoff with India, Lt. General Khalid Kidwai pronounced the most specific thresholds for Islamabad’s use of nuclear weapons including: a “geographic” threshold defined as India having conquered a significant portion of its territory; a “military” threshold, defined as India having destroyed a significant portion of Pakistan’s armed forces; an “economic” threshold, defined as India successfully employing a strategy of economic strangulation against Pakistan; and “domestic” threshold, defined as India successfully inciting internal unrest in Pakistan.²⁴⁸

Pakistan’s nuclear weapons are overseen by a tripartite body consisting of: the National Command Authority (NCA), a 10-member group chaired by the president, which is responsible for formulating policy, and deploying and coordinating forces; the Strategic Plans Division, made up of 50-70 officers from the military services, which carries out the day-to-day management of Pakistan’s nuclear arsenal, including implementing the NCA’s policies and safeguarding nuclear weapons and nuclear sites; and the Services’ Strategic Forces Command, which is responsible for the tactical control of Pakistan’s nuclear weapons delivery systems. A decision to launch a nuclear strike can only be made by a consensus vote in the NCA, with the chairman casting the final vote.²⁴⁹

²⁴¹ Ibid and Gurmeet Kanwal, “India’s Nuclear Doctrine: Reviewing NFU and Massive Retaliation,” Institute of Peace and Conflict Studies, January 7, 2015, <http://www.ipcs.org/article/india/indias-nuclear-doctrine-reviewing-nfu-and-massive-retaliation-4798.html>.

²⁴² C. Raja Mohan, “Nuclear Command Authority comes into being,” The Hindu, January 5, 2003, <http://www.thehindu.com/2003/01/05/stories/2003010504810100.htm>.

²⁴³ Kerry Boyd, “India Establishes Formal Nuclear Command Structure,” Arms Control Association, January 1, 2003, <https://www.armscontrol.org/print/1187>.

²⁴⁴ Feroz Hassan Khan, “Going Tactical: Pakistan’s Nuclear Posture and Implications for Stability,” IFRI Security Studies Center, September 2015, p. 35, <http://watson.brown.edu/files/watson/imce/events/2016/Khan%20-%20Going%20Tactical.pdf>.

²⁴⁵ Naeem Salik, “The Evolution of Pakistan’s Nuclear Doctrine,” Naval Postgraduate School, p. 77, http://my.nps.edu/documents/104111744/106151936/6+Nuclear+Learning_Salik.pdf/3457bf32-507c-4120-8c74-45d71d4340b7.

²⁴⁶ Feroz Hassan Khan, “Going Tactical: Pakistan’s Nuclear Posture and Implications for Stability,” p. 27.

²⁴⁷ “If needed, we can use nuclear weapons: Pakistani Defense Minister Khawaja Asif,” The Economic Times, July 8, 2015, <http://economictimes.indiatimes.com/news/defense/if-needed-we-can-use-nuclear-weapons-pakistani-defense-minister-khawaja-asif/articleshow/47984887.cms>.

²⁴⁸ Henry Sokolski, “Pakistan’s Nuclear Future, Reining in the Risk,” U.S. Army War College, December 2009, p. 79, <http://www.strategicstudiesinstitute.army.mil/pdffiles/pub963.pdf>.

²⁴⁹ Ian Bremmer and Maria Kuusisto, “Pakistan’s Nuclear Command and Control: Perception Matters,” South Asian Strategic Stability Institute, May 2008, pp. 10-1, http://mercury.ethz.ch/serviceengine/Files/ISN/99926/ipublicationdocument_singledocument/15e8eab1-a376-4454-8dd1-a16e1f1d40e1/en/RR+No+15.pdf.

United States

The 2013 White House factsheet on the U.S. nuclear posture reaffirms the language in the 2010 Nuclear Posture Review (NPR), which states that the “fundamental role of U.S. nuclear weapons, which will continue as long as nuclear weapons exist, is to deter nuclear attack on the United States, our allies, and partners.”²⁵⁰ According to the factsheet, the U.S. nuclear arsenal serves to convince potential adversaries that the consequences of a nuclear attack on the United States, or its allies or partners, would far outweigh any potential benefits of such a strike. The NPR stresses that the United States “would only consider the use of nuclear weapons in extreme circumstances to defend the vital interests of the United States or its allies and partners,” and that it is in the U.S. and global interest to ensure that nuclear weapons are never used.²⁵¹

In the NPR, the Defense Department provides a strengthened “negative security assurance” (NSA). It declares that the United States “will not use or threaten to use nuclear weapons against non-nuclear weapons states that are party to the NPT and in compliance with their nuclear non-proliferation obligations,” with the caveat that it “reserves the right to make any adjustment in the assurance that may be warranted by the evolution and proliferation of the biological weapons threat and U.S. capacities to counter that threat.”²⁵²

The U.S. nuclear arsenal is overseen by the Defense Department’s Strategic Command. Only the president can direct the use of nuclear weapons.²⁵³

²⁵⁰ “Nuclear Posture Review Report,” U.S. Department of Defense, April 2010, p. vii, http://www.defense.gov/Portals/1/features/defenseReviews/NPR/2010_Nuclear_Posture_Review_Report.pdf.

²⁵¹ *Ibid.*, viii-ix.

²⁵² *Ibid.*, viii.

²⁵³ “Frequently Asked Questions about Taking Nuclear Weapons Off Hair-Trigger Alert,” Union of Concerned Scientists, January 2015, p. 3, <http://www.ucsusa.org/sites/default/files/attach/2015/01/Hair-Trigger%20FAQ.pdf>

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