Journal of International Politics and Economics, No.17, March 2011

(Article)

A Legal Review of the Military Utilization of Earth Orbits

Susumu TAKAI[1]

Introduction

International Air Law and International Space Law are applicable in the region above the earth. International Air Law applies to aircraft in the air space and flying aircraft are regulated by the sovereignty of a country. International Space Law is intended to apply to objects in outer space, and space objects are free from the sovereignty of a country. The boundary between the air space and the outer space is generally understood to be the lowest possible earth orbit.

A ballistic missile is a weapon that is launched from a ground (or sea) base, flies through outer space, and strikes in an opponent's territory. Thus, a ballistic missile is neither an aircraft nor a space object. It follows that the development and utilization of ballistic missiles is not banned under general international law.

Space development and utilization is closely related to the development of ballistic missile technology. During the Cold War, the intercontinental ballistic missile technologies developed by both the United States of America and the Soviet Union - the major space powers - promoted the military utilization of earth orbits.

There is no International Law that restricts development of nuclear weapons except the Non-Proliferation Treaty. If a country is not a contracting party to the Treaty that country is free to develop nuclear weapons. The Missile Technology Transport Regime (MTCR) restricts the transfer of missile technology, but again, if a country is not a signatory, that country is free to transfer and/or receive missile technology. Therefore missile development cannot be restricted under a general international law.

The High-Level Panel of the United Nations[2] submitted a report concerning "a Global Threat to the Security and the Reform of an International System" to the United Nations soon after the United Nations Millennium Summit in December, 2004. The Report of the Panel noted that there were six clusters of threats with which the world needed to be concerned with in the immediate future and in the decades ahead. These were: economic

and social threats, including poverty, infectious diseases and environmental degradation; inter-state conflict; internal conflict, including civil war, genocide and other large-scale atrocities; nuclear, radiological, chemical and biological weapons; terrorism, and transnational organized crime[3].

Today, the most serious challenge to a threatened country is how to defend against nuclear ballistic missile attack. As there seems to be no fully effective ground-based missile defense system, various types of military satellites seem to be inevitable in the future. The deployment of military satellites is not prohibited under the Outer Space Treaty of 1966. The purpose of this article is to review the issues surrounding the military utilization of earth orbits and the related space laws.

1 Cold War and Space Utilization

The Cold War proceeded along with the competition in the development of strategic missile technology between the United States of America and the Soviet Union. The development of rocket engine technology and missile guidance was indispensable to the corresponding technology of satellite launch and control. Both countries competed vigorously. As military super powers they had similar viewpoints that leadership in space technology development was linked to political and military superiority.

This space technology development competition between the two super powers started when the Soviet Union launched Sputnik 1 into earth orbit in 1957. There were a series of keen competitions over the launching of a manned satellite, the first space walk, and the attainment of moon orbit. These culminated with the Apollo 11 Mission of the United State which achieved the first soft landing on the surface of the Moon and returned to the earth safely in 1969.

During the space technology development competition, both countries gradually recognized that it would be impossible to defend from a nuclear strategic missile attack. They then concluded Strategic Arms Limitation Treaty (SALT) in 1972 and the Anti-ballistic Missile (ABM) Treaty in the same year. Subsequently, both countries adopted a Mutual Assured Destruction (MAD) strategy[4], and the world entered into détente era.

The 1970's was the decade in which many nations started space technology development, and when full scale commercial utilization of space began. Hackneyed military satellite technology was transferred to commercial space technology and commercial utilization of earth orbits has progressed rapidly since then. The U.S. Space Shuttle program debuted in 1970's. The International Telecommunications Satellite Organization (INTELSAT) was established in 1973 and the International Maritime Satellite Organization (INMARSAT) followed in 1979.

During the 1980's, the détente between the U.S. and the USSR continued and expanded to include direct cooperation as illustrated by the space rendezvous project. The advanced earth observation satellite - LANDSAT - was launched in the détente era. The Strategic Defense Initiatives (SDI)[5] that the U.S. had advocated in 1983 and 1985 were started at

the laboratory level; SDI played an important role in the ending of the Cold War. During the same period many countries created domestic legislation aimed at stimulating their independent space development programs.

2 COUPUOUS and drafting the Outer Space Treaty

The launch of Sputnik I made the world recognize the necessity for the international regulation of the use of space. In 1958, The United Nations established the Committee on the Peaceful Uses of Outer Space (COPUOS), with the mandate to examine legal issues concerning the peaceful uses of outer space.

There were arguments whether "peaceful uses" meant "non-military uses" particularly since it was the military sectors of both space super powers who were driving the development of space technology. Neither country welcomed a discussion of the prohibition of the military uses of outer space at the legal sub-committee in the COPUOS. Both countries had common interests in securing freedom for "military uses" of outer space.

During arguments on the interpretation of "peaceful uses", the Soviet Union initially insisted that within the emerging legislative framework, the term "peaceful" should include "non-military" and that military applications should be prohibited in outer space. The Soviet Union also insisted that "peaceful uses" of outer space were closely related to disarmament, and that the two should be considered together.

The U.S., on the other hand, insisted that military utilization of outer space should be judged in accordance with the Charter of the United Nations and other international laws, and should not be judged by the terminology of "military" or "non-military". The U.S. also argued that military utilization of outer space should correspond to the purpose of the United Nations and military utilization should not be prohibited. In other words, the U.S. insisted that the term of "peaceful" should be contrasted with the term "aggressive", and "peaceful uses" should be interpreted to mean "non-aggressive uses".

The Soviet Union ultimately modified its viewpoint and accepted the interpretation proposed by the United States, agreeing that the issues of disarmament and the militarization of space could be tackled separately and that the terms "peaceful uses" and "non-military uses" should not be seen as being synonymous. As a consequence the term "peaceful uses" now tends to be interpreted as "non-military uses" and the term "non-military" is used to mean complete exclusion of military objectives or character. Most other nation - with the notable exception of Japan - have accepted this interpretation.[6]

The COPUOS decided that the issue of the aggressive military uses of outer space should be handled in the United Nations Disarmament Commission (UNDC)[7], and decided to focus exclusively on the issues of the peaceful uses of outer space. The U.S. and the Soviet Union then jointly proposed a compromise draft of the Outer Space Treaty to the legal sub-committee of COPUOS.

The COPUOS adopted the draft and submitted it to the United Nations General

Assembly, and the Outer Space Treaty[8] was adopted in December, 1966. The Treaty is called a Space Constitution because humankind's space activity will be regulated according to various principles provided in the Treaty. After the Treaty came into effect, four space laws[9] were subsequently legislated in accordance with the Treaty.

Article 4 of the Outer Space Treaty is said to be a disarmament clause, however, it does not have rigid provisions on military utilizations in the earth orbit. Article 4 provides that the non-military uses of outer space are limited to "moon and other celestial bodies", because military uses of outer space were concentrated in the earth orbit. Both the U.S. and the Soviet Union succeeded in getting a free hand for the military utilization of earth orbits, while agreeing to the compromise of a complete restriction on military use of "the moon and other celestial bodies".

3 Military Satellites in Earth Orbit

The U.S. and the Soviet Union have developed various types of practical military satellites based upon technical knowledge that was acquired during the space technology development competition. As mentioned above, both countries have concentrated on and developed earth orbit, military satellites because military satellites are indispensable for a modern army to operate effectively in both wartime and peacetime.

Satellites with military purposes are classified into two groups; the first includes passive support systems such as reconnaissance satellites, communications satellites, weather satellites, and earth observation satellites; the other classification encompasses active weapon systems such as hunter-killer satellites.

Military earth observation satellites are classified into five categories according to their purpose such as a photoreconnaissance satellites, electronic intelligence satellites, ocean surveillance satellites, early-warning satellites, and nuclear explosion detection satellites.

Military electronic intelligence satellites were developed to collect electromagnetic wave information from certain military headquarters on the earth and are indispensable to modern warfare. The military sector continuously gathers important information such as electronic warfare support, electronic countermeasures, and electronic counter countermeasures by means of intelligence satellites. They have become essential to the effective operations of modern military forces in wartime.

Military communications satellites and military navigation satellites are indispensable for super powers to operate their military forces deployed globally; the former are used for command, control and communication among military forces deployed worldwide, and the latter are used for acquiring exact target position of an enemy's ground troops, military vessels and aircraft. Military weather satellites enable military meteorological observations in various parts of the earth.

Military geodetic satellites were developed to model the exact shape of the earth and its gravitational field as well as the topology characteristics of the oceans. These military satellites are used for taking pictures of an enemy's military assets and for bombarding

targets.

Military Early-Warning Satellites detect a missile launch using infrared receptors that sense the boost heat of ballistic missiles. These satellites also detect the missile launching base, the precise position of the missile along its trajectory, the exact reentry time and the intended impact area - transmitting the appropriate alert signals in real time. This type of satellite is crucially important as an element of any missile defense system. A nuclear explosion detection satellite was developed to detect violations of the Partial Test Ban Treaty of 1963.

There are two types of active missile attack weapon systems: one is called a hunter-killer satellite which approaches and collides with a target satellite in earth orbit [10], and the other is an anti-satellite missile that is launched from the surface of the earth or from a high-flying interceptor aircraft.

4 The Ballistic Missile Defense System of the United States.

With the advent of the Cold War, the U.S. developed a triad of nuclear weapons systems. This included intercontinental ballistic missiles (ICBM), manned strategic bombers (SB) and submarine launched ballistic missiles (SLBM).

As noted above, the U.S. and the Soviet Union concluded two treaties - The Strategic Arms Limitation Treaty in 1972 and The Anti-Ballistic Missile Limitation Agreement in 1972 - to avoid the terrifying prospect of accidental nuclear warfare. They both subsequently adopted a new nuclear strategy known as Mutual Assured Destruction (MAD).

President Ronald Reagan of the U.S. was suspicious about the MAD strategy and proposed a new nuclear strategy - The Strategic Defense Initiatives (SDI) - in 1983. President Reagan's strategy envisioned the interception of every launched ICBM before it reached the U.S. homeland. The Soviet Union, understandably, objected to the development of SDI technology. After prolonged negotiations, both countries agreed to study SDI elements at the laboratory level. The Soviet Union, however, gave up the technological development of SDI; this "capitulation" subsequently became one of the contributing factors to the end of the Cold War in 1989.

President George H. W. Bush (the Elder) announced a new nuclear strategy of Global Protection against Limited Strikes (GPALS) soon after the end of the Cold War. GPALS was a defensive strategy against a limited nuclear missile attack. Bush's successor, President William Clinton promulgated two nuclear strategies; the National Missile Defense (NMD) to defend the U.S. homeland from ICBM attack, and Theater Missile Defense (TMD) to defend allies from the theater ballistic missile (TBM) strikes. Finally, in May, 2001, President George W. Bush (the Younger) integrated NMD and TMD into Missile Defense (MD).

The MD system developed by the U.S. is a multilayered missile defense system. It will protect against intruding nuclear ballistic missiles with the Airborne Laser (ABL) [11] and

Kinetic Energy Interceptor (KEI)[12] in the boost stage, the Naval Standard Missile (SM-3)[13] in the midcourse stage, and the THAAD[14] missile and the advanced capability Patriot Missile (PAC-3)[15] in the terminal stage.

5 Ballistic Missile Defense System of Japan

North Korea launched the first Taepo-Dong I missile in August 1998. The missile flew over Japanese territory and fell into the Pacific Ocean. North Korea explained the event as the failure of a satellite launching[16]. This incident raised arguments for the reexamination the Japan's interpretation of the concept of "peaceful uses" of space.

Ballistic missiles that North Korea has developed include the Scud B with a range of 300km and the Scud C with a range of 500km; these are believed to be targeted at South Korea, The No-Dong Missiles with a range of 1300km can reach Japan, and Taepo-Dong I with a range of 1500km could reach Australia. It is believed that these ballistic missiles are already operationally deployed. In addition, North Korea is thought to be developing a Taepo-Dong II with a range of more than 5,000 km that could be targeted at the United States.

Were North Korea to launch a No-Dong against Japan, the missile would separate from its booster within 2 minutes. The reentry vehicle with nuclear warhead would reach its highest altitude of approximately 200 km, and reenter the atmosphere at a speed of around 3km per second. Baldly stated, a North Korean ballistic missile could strike the territory of Japan within 10 to 15 minutes of launch.

Japan has had to respond to the rapid change in the security environment of the Northeast Asia region. Therefore, the Japanese Government decided to adopt a security policy based on BMD in December, 2003. The Government argued that because Japan's BMD system was purely defensive, it was not in contradiction to Japan's traditional "peaceful uses" interpretation,

Japan's BMD is composed of command and control elements, battle management elements, telecommunication system elements and the sensor systems for detecting and pursuing intruding missiles. The BMD will be able to synchronize effectively two different defensive missiles such as an advanced capability Patriot Missile (PAC-3) from a land base and a standard missile (SM-3) from a sea-based Aegis[17] system , In other words, Japan's BMD system will be expected to intercept a North Korean TBM with a combination of SM-3s in the upper tier at altitudes of 90km in the midcourse phase and PAC-3 in the lower tier at altitudes of 15km of the terminal trajectory.

Conclusion

The competition in space development between the United States and the Soviet Union and the military utilization of earth orbits were examined above. Since the military sectors of the two space super powers were engaged in the development of space and missile technology, the Outer Space Treaty admits launching military satellites for peaceful

purposes into earth orbits.

The development of ballistic missiles and nuclear warheads is not restricted in general international law. It is necessary for every threatened country to be able to intercept nuclear ballistic missiles before damage occurs, because the destructive power of a nuclear weapon is enormous. Space powers except Japan have concentrated on developing various types of practical military satellites, and some of them are utilized as elements of a Ballistic Missile Defense system.

Japan has several problems relating to the implementation of an effective BMD system. Ballistic missile information from an early warning satellite is indispensable to the interception of nuclear ballistic missiles. However, Japan cannot legally deploy an early warning satellite for detecting North Korean ballistic missile launches, because Japan still maintains the interpretation of "peaceful uses" as meaning "non-military uses", even though an early warning satellite is assumed to be "non-aggressive use" in general by the rest of the international space community.

If Japan's interpretation of "peaceful uses" is not to be changed, Japan must obtain the necessary information of a threatening ballistic missile launch from the early warning satellites of the United States. Whether or not the U.S. would actually provide that data in a timely fashion - in the midst of Japan's crisis - is uncertain. It is not surprising that thoughtful Japanese citizens worry about the reliable operation of the country's BMD system[18].

---

1 The author is Lecturer at the Postgraduate School of Nisho-Gakusha University, and he is Professor Emeritus of the National Institute for Defense Studies of Japan and President of the Japan Society of Defense Law at the moment.

2 On November 4, 2003, the United Nations Secretary General announced the creation of a High-Level Panel on threats, Challenges, and Change to assess the principal threats to international peace and security in the 21st century and to recommend changes to improve the effectiveness of international institutions like the United Nations in responding to those threats. The panel consisted of 16 eminent international figures and released its report in December 2004.

3 *The report of the panel, ibid.*, p. 12.

4 The two country's nuclear strategy is that they agree that their number of anti-ballistic missiles be strictly limited and each remain vulnerable to strategic nuclear missile strikes from each other. While an initial nuclear missile strike would surely destroy the enemy homeland, as long as all of the enemy's counterattack capabilities were not annihilated, a second retaliatory strike by the enemy's surviving nuclear missiles would surely destroy the country launching the initial attack.

5 See, Takai and others, "*TMD - Theater Missile Defense*", TBS Britanica Pub.Co., 1994.

6 The Japanese government still maintains the interpretation of the term "peaceful purpose" as "non-military purpose".

7 UNDC is a deliberative body and a subsidiary organ of the UN General Assembly and is mandated to consider and make recommendations on various disarmament-related issues and to follow up the relevant decisions and recommendations in special sessions devoted to disarmament.

8 The Treaty on Principles Governing the Activities of State in the Explorations and Uses of Outer Space, including the Moon and Other Celestial Bodies, *G. A. Resolution 2222*, 12 December, 1966.

9 The Agreement on the Rescue of Astronauts, the Return of the Astronauts, and the Return of the Objects Launched into outer space in 1968, the Convention on International Liability for Damage Caused by Space Objects in 1972, the Convention on Registration of Objects Launched into Outer Space in 1975, and the Agreement governing the Activities of States on the Moon and Other Celestial Bodies in 1979.

10 China's weather-monitoring satellite "Feng Yun" launched in an ultra circular orbit in 1999, had become obsolete by 2007 and was the object of a Chinese test to destroy a satellite in space. Fragments of "Feng Yun" were scattered as space debris over a range from 200km to 3000km, an act for which China was exposed to extensive international criticism.

11 The Airborne Laser is a high-flying megawatt laser that pinpoints a ballistic missile lifting off hundreds of kilometers away, and is an alternative to terminal defenses.

12 The Kinetic Energy Interceptor is a missile defense program whose goal is to design, develop, and deploy kinetic energy-based, mobile, ground and sea-launched missile that can intercept and destroy enemy ballistic missiles during their boost phase. KEI elements consist of an Interceptor Component, a Mobile Launcher Component, and a Command, Control, Battle Management, and Communications (C2BMC) Component.

13 The Standard Missile 3 is a ship-based anti-ballistic missile used by the Aegis Ballistic Missile Defense System. SM-3 is being developed as part of the U.S. Navy's sea-based ballistic missile defense system and will provide theater-wide defense against medium and long range ballistic missiles.

14 The THAAD (theater high-altitude area defense) missile system is an easily transportable defensive weapon system to protect against hostile incoming threats such as tactical and theater ballistic missiles at ranges of 200km and at altitudes up to 15km. The THAAD system provides the upper tier of a 'layered defensive shield' to protect high value strategic or tactical sites such as airfields or populations centers. THAAD missile intercepts both exo-atmospheric and endo-atmospheric threats.

15 The PAC-3 is a solid-propellant rocket-powered missile controlled by both aerodynamic fins and small forebody-mounted Attitude Control Motor (ACM) rockets for increased terminal agility.

16 North Korea became a signatory to the Outer Space Treaty on 12 March, 2009.

17 The Aegis is the escort vessel with the air defense capability of the world highest level missile, and is able to pursue the enemy aircraft of 100 or more and destroy more than ten aircraft at the same time with efficient radar. Japan started to build the Aegis vessels in 1993, and four vessels in five Ages vessels will be equipped with SM3 missile by 2010.

18 The International Maritime Organization reported that North Korea set the cautionary water zone for communication satellite test launching in March 2009. Japan assumed that it violated UN Security Council Resolutions 1695 and 1718 and requested that North Korea cancel the launch. The Japanese Government ordered the deployment of two Aegis destroyers in the Sea of Japan, and the PAC-3 force in the Tohoku region and the metropolitan area in the Sea of Japan. The North Korean test missile impacted in the Pacific Ocean 17 minutes after launching after passing over the Tohoku region. Japan tried to gather early-warning information with various radars, but failed to do so because of false launch information and communication gaps.