Japan's Missile Defense

Diplomatic and Security Policies In a Changing Strategic Environment

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"Japan's Missile Defense – Diplomatic and Security Policies in a Changing Strategic Environment"

Foreword

This report summarizes the major outcomes of our institute's research project on missile defense. Since the end of the Cold War, one serious threat against international security has been the proliferation of weapons of mass destruction and missiles to deliver them. To counter such a threat, Japan decided to start joint technical research on ballistic missile defense (BMD) with the US in 1998, and the Japanese government in December 2003 announced its decision to introduce BMD systems. Later, in December 2005, Japan-US joint technical research was upgraded to Japan-US joint development on BMD interceptor missiles (SM-3) to be installed on Aegis ships.

Needless to say, such a development was an important step forward for Japan's missile defense. In further promoting missile defense in the future, however, there remain many different and difficult problems that should be addressed and resolved. Moreover, countermeasures against missile threats are not necessarily limited to just one form of missile defense to intercept missiles flying into Japan. To prevent, eliminate and neutralize the threats of missiles, and to confine the damage caused by missiles, more comprehensive measures combining every conceivable approach to mitigating the threats of missiles must be adopted and implemented with greater efficiency and effectiveness.

With thorough recognition of the above issues, this research project reviewed comprehensive measures that Japan should adopt to confront missile threats by conducting periodic meetings and discussions, and arranging opportunities to exchange views with governmental officials, experts, and professionals, including those in the US and Europe.

We would like to acknowledge here various individuals who have contributed to the study, and express our sincere appreciation to the research project members Hiroshi Tajima, Kazumasa Kobayashi and Hideaki Kaneda—all three were senior adjunct research fellows of our institute at the time—and Hirofumi Tosaki (Research Fellow of our Institute) for their active efforts in conducting research and writing this report; Yusuke Nagai (Japan's Independent Institute Co., Ltd.) for the assistance in this study; and other experts and professionals from both the public and private sectors for their cooperation in exchanging views.

It should be noted that the views expressed in this report are those of the individual authors, that is, the research project members, and do not necessarily reflect the views of our institute. However, we sincerely hope that the report will present valuable views and information on reviewing Japan's missile defense policies.

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Introduction: Ballistic Missile Launches by North Korea

1. North Korea's Ballistic Missile Launches and Nuclear Test Explosion

On October 3, 2006, a statement by North Korea's Foreign Ministry declared that country's intention to conduct nuclear tests, followed on October 9 by an announcement that the underground nuclear test explosion had been conducted "under safe conditions." It is still not clear whether it was successful, so detailed analysis must wait for another occasion. However, it is at least clear what North Korea's announcement meant to the international community. The US government thinks that it will take another several years for North Korea to possess nuclear warheads that can be delivered on ballistic missiles. Still, North Korea's announcement of a nuclear test as well as its recent series of ballistic missile launches have further heightened Japan's realization of the need for comprehensive measures against missile attacks.

From mid-May 2006, North Korea showed signs of preparing to launch a Taepo Dong 2 ballistic missile. On July 5, just when some observers held the optimistic view that North Korean leaders would not launch, they surprised the world by firing a series of ballistic missiles. In addition to one Taepo Dong 2, Scud and Nodong missiles were also launched, for a total of six missiles on the morning on July 5 (JST) and one more that evening. All missiles landed in the northern Sea of Japan off the coast of Russia's Primorye Province.

The Taepo Dong 2 was launched from Musudan-Ri Base, North Hamgyong Province in the northeastern region of North Korea, but fell into the water off the coast of North Korea about 40 seconds later. According to statements at the September 15 press conference of Japan Defense Agency Director General Fukushiro Nukaga, the first stage of the North Korean Taepo Dong missile broke up in the air within several dozen seconds of launch without being separated, and crashed near the launch site. At present, analysis by Japan and the US indicates that the Taepo Dong 2 launch was a failure, but final assessment should wait for additional confirmation. The other ballistic missiles are thought to have been launched from the area of Kitdaeryong Base in the southeast part of North Korea; these landed in the sea several hundred kilometers northwest of Niigata Prefecture in Japan.

The ballistic missiles launched from North Korea appear to include Scud Ds with a range of 700km, or Scud ERs with a range of 1000km, which shows that North Korea has continued to improve already deployed Scud missiles. Scud ERs can reach the western half of Japan, and thus North Korea's progress in developing and mass producing these new types of Scud missiles raises serious concerns.

Prior to the launches, North Korea declared a moratorium on the launching of long-range ballistic missiles in the Geneva Agreement with the US in 1999. In the Japan-North Korea Pyongyang Declaration in September 2002, North Korea "expressed its intention that, pursuant to the spirit of this Declaration, it would further maintain the moratorium on missile launching in and after 2003." The missile launches in July 2006 were in defiance of North Korea's previous commitments with the US and Japan, as well as messages from the international community, including China, requesting restraint.

The North Korean Foreign Ministry Spokesman said on July 6 that the missile launches were a part of routine military exercises that are North Korea's legitimate right as a sovereign state. He argued that North Korea was not bound by any bilateral or multilateral agreements such as the Geneva Agreement, Pyongyang Declaration or the Joint Statement of the Six-Party Talks because the moratorium on long-range missile tests to which North Korea had agreed with the US in 1999 was valid only when North Korean-US dialogue was underway. He further made the intimidating comment that North Korea "will have no option but to take stronger physical actions of other forms, should any other country dare take issue with the exercises and put pressure upon it." Song Il Ho, the North Korean ambassador in charge of diplomatic normalization talks with Japan, also commented in his press conference that the statement by the North Korean Ministry of Foreign Affairs had taken Japan into consideration, and said that "if Japan condemns North Korea, then North Korea will have to take a much stronger physical response."

2. Responses of Northeast Asian Countries

The responses by Northeast Asian countries to North Korea's ballistic missiles launches were divided. Japan and the US considered North Korea's launches a serious threat to their respective national security and immediately proposed to the UN Security Council a resolution imposing sanctions under Chapter 7 of the UN Charter. Japan was particularly active in UN diplomacy. China and Russia, on the other hand, strongly opposed the adoption of a resolution to impose sanctions and indicated that they might exercise a veto to kill such a resolution, although both countries did express "serious regrets" regarding the actions taken by North Korea. Finally, a compromise was made, and UN Security Council Resolution 1695 was unanimously adopted on July 15, 2006, after eliminating the reference to Chapter 7 of the UN Charter.

However, North Korea refused to accept this resolution 45 minutes after its adoption, and suggested the possibility of launching more missiles. Regarding a return to the Six-Party Talks, North Korea has not withdrawn its condition that the US lift its financial sanctions.

These events showed that there is a polarization of opinion concerning security issues in Northeast Asia, with Japan and the US at one end and China and Russia at the other. It should be noted that South Korea's current administration, increasingly leaning towards an anti-Japan stance, has adopted a pro-China posture. On the other hand, it is noteworthy that five of the countries in the Six-Party Talks (excepting North Korea) do share a consensus that the Talks should be used as a forum for discussing the security of the Korean Peninsula, including North Korea's nuclear program and missile issues, and that they agreed to continue requesting that North Korea return to the Six-Party Talks.

Should the Six-Party Talks resume and there is substantive discussion in the future, these Talks could significantly contribute to the stability and the security of Northeast Asia. If North Korea does not return to the Six-Party Talks in the near future, the other five countries may hold a meeting among themselves. If that occurs, these "Five-Party Talks" could become a practical mechanism for regional security dialogue. Japan, which has always stood on the sidelines during the Six-Party Talks, would be challenged to proactively address regional security issues such as arms control, disarmament and non-proliferation with regard to nuclear weapons and ballistic missiles.

3. Promoting Japan-led "Dissuasion Diplomacy"

While North Korea's motivation and intention for the recent ballistic missile launches is still unknown, it may be a response to US "financial sanctions" and an attempt to force the US to hold direct talks with North Korea. It is also considerd that the intention of the launches included missile development tests, military exercises regarding launches, or a demonstration to show the capabilities of North Korea's operational ballistic missiles. In relation to this, Christopher R. Hill, the US Assistant Secretary of State for East Asian and Pacific Affairs, testified on July 20, 2006 before the Senate Foreign Relations Committee that personnel from Iran observed North Korea's missile launches. Iran has reportedly received technological assistance related to ballistic missiles from North Korea.

For Japan, North Korea's missile tests provides an opportunity to recognize that proliferation of ballistic missiles to states and even to non-state actors such as international terrorists is a serious problem. It will be important to reinforce cooperation on concrete actions to prevent proliferation not only with Northeast Asian but also Middle Eastern, Southwest Asian and Southeast Asian countries. It is worth noting that the Chairman's Press Statement for the ASEAN Post Ministerial Conference (PMC) of July 27, 2006, referred to the North Korean issue: "[T]he

Meetings strongly urged the DPRK to refrain from any action that might aggravate tension, return immediately to the Talks without preconditions, and work towards the expeditious implementation of the 19 September 2005 Joint Statement as was unanimously agreed upon in this Resolution."

Japan played a key role in the adoption of the UN Security Council resolution on North Korean missile launches. On the same day as the North Korean missile launches, the Security Council of Japan decided to implement countermeasures, including a prohibition on port entry by the North Korean vessel *Man Gyong Bong* for six months, and a ban on entry by North Korean governmental officials.

The UN Security Council Resolution stipulates that the Council "[r]equires all Member States…to exercise vigilance and prevent missile and missile-related items, materials, goods and technology being transferred to DPRK's missile or WMD programs" and "to exercise vigilance and prevent the procurement of missiles or missile related-items, materials, goods and technology from the DPRK, and the transfer of any financial resources in relation to DPRK's missile or WMD programs." Since North Korea refused to accept the UN Security Council Resolution, Japan decided in September 2006 to further implement financial sanctions and more strict export controls against North Korea under the Foreign Exchange and Foreign Trade Control Law. The financial sanctions involve freezing assets that belong to 15 organizations and one individual listed as being suspected of involvement in North Korea's development of nuclear weapons and missiles. In regard to the further strengthening of export controls, Japan is considering revising its Foreign Exchange and Foreign Trade Control Law to require that companies report the export destinations of approximately 40 items that could be used in the development of weapons of mass destruction and missiles. This revision will designate certain domestic companies that have trade relationships with North Korea as companies connected with a sanctioned country and put them under obligation to report these export items and their destinations, even if not North Korea, to prevent any possibility of roundabout exports to North Korea. International cooperation is essential to make such measures effective. Japan must make every effort to appeal to other UN member countries so that the international community will adopt similar measures for preventing North Korea from developing and trading missiles.

The threat of ballistic missiles to Japan comes not just from North Korea. To stabilize the security environment of Northeast Asia, Japan must promote "dissuasion diplomacy." Japan should also take the initiative in establishing a regional framework for discussing arms control, disarmament and non-proliferation of nuclear weapons and ballistic missiles, and for persuading

countries of concern through bilateral meetings. Japan, as the President of the UN Security Council, expressed "deep concern" immediately after North Korea's declaration of its intent to conduct nuclear tests (October 6, 2006), and successfully led the Security Council to adopt Resolution 1718 (October 14, 2006), which imposed economic sanctions under Chapter 7, Article 41 of the UN Charter. This development undoubtedly demonstrated Japan's capability in dissuasion diplomacy, and may be the result of Japan's dissuasion diplomacy initiatives following North Korea's ballistic missile launches in July 2006, in addition to other diplomatic efforts such as Prime Minister Shinzo Abe's visits to China (October 8, 2006) and South Korea (October 9, 2006).

4. Significance of Developing "Deterrence Posture"

When North Korea launched its missiles July 2006, Japan had no system capable of intercepting ballistic missiles. However, since Japan was in the process of developing such systems, it was able to successfully detect and track some of the North Korean missiles in cooperation with the US. Japan's capabilities to obtain such precise information on a timely basis were an important factor that allowed Japan to take a proactive and crucial role in "dissuasion diplomacy" at the UN Security Council.

After the detection of North Korea's preparations for launching a Taepo Dong 2, several countries, including China, had attempted to dissuade North Korea from actually launching, but North Korea did not heed the requests of these countries. One would argue that the fact that both Japan and the US had yet to possess the capability for intercepting ballistic missiles coming toward Japan might have been a factor in North Korea's decision to launch the missiles. However, even if Japan and the US had such an effective capability, the missiles would not have been intercepted because their impact areas were far from Japanese or US territory. Since North Korea did not have the intention of attacking Japan or the US, it was unlikely that the US would have attempted preemptive strikes on North Korean missile launchers.

North Korea might have thought that launching ballistic missiles would let them achieve political purposes, and that Japan and the US would not implement strong countermeasures. However, its attempts failed partly because both Japan and the US clearly adopted steadfast postures of not yielding to countries trying to achieve their goals by intimidation. Such postures were strongly reflected in their subsequent diplomacy. Although Japan and the US could not prevent North Korea's missile launches, it is important to note that both countries set the precedent that strong measures would also be taken if similar events were to occur in the future. In order to conduct effective diplomacy without yielding to intimidation, "power" is still imperative in the current international community. Japan's development of deterrence by denial is essential in terms of

reinforcing its diplomatic power.

If Japan develops deterrence by denial that includes capabilities for offensive defense, active defense and passive defense, such reckless acts by North Korea may be deterred more effectively. North Korea may be forced to realize that it cannot achieve expected outcomes through using or threatening to use ballistic missiles, and be dissuaded from conducting such an attack. Here lies the significance of Japan developing its "deterrence posture."

Japan's introduction of BMD systems, as well as the start of serious discussions on possessing a surgical strike capability against opponents' ballistic missile bases as offensive defense, have undoubtedly made Japan's "dissuasion diplomacy" more effective. One reason why China strongly opposed the proposed UN resolution to sanction North Korea at first was that China wanted to demonstrate its influence over North Korea and hoped to get some favorable response. However, North Korea unexpectedly did not respond to China. As the same time, China encountered time pressure from the G8 Summit in St. Petersburg and the US-China summit. Under such situations, China may have been concerned that, if the situation surrounding North Korea's ballistic missile launches worsened, Japan might adopt more active security policies and accelerate building up its deterrence by denial capability, including the capability to launch surgical strikes against missile bases. Thus China wanted to resolve the issue quickly, and agreed to the UN Security Council resolution that strongly condemned North Korea, but did so without sanctions.

5. Early Development of "Defense Capability"

When North Korea launched Taepo Dong 2 on July 5, 2006 (JST), the US was prepared to intercept it using its GMD interceptors, should it fly close to the US homeland. In the end the Taepo Dong 2 did not even fly over the Japanese archipelago, so there was no need for the US to launch interceptors.

In addition, the US had mobilized Aegis destroyers, RC-135S "Cobra Ball" electronic reconnaissance aircraft, the missile monitoring ship "Observation Island", the X-band radar located at Shariki Air Self Defense Force Base in Aomori Prefecture in Japan, as well as early warning satellites (DSP). Japan mobilized the FPS-XX radar, which had been only used for tests and was not yet fully operational, Aegis ships, EP-3C and YS-11E electronic intelligence aircraft, and P-3C patrol planes. Thereby both countries set up a multi-layered system ready to track ballistic missiles launched by North Korea. In other words, they had mobilized almost all their monitoring capabilities at that time.

In reality, however, the Japan-US joint operation for ballistic missile defense was found not to be fully developed, especially in regard to establishing a Common Operational Picture (COP) and other issues related to information exchange, interoperability, and peacetime cooperation and operational coordination between Japan's Self-Defense Forces and US Forces. Therefore, there is need for review and improvement, especially in the areas of "information sharing" and "coordination of operations." It will be a future challenge for Japan to seek full development of a Japan-US joint operational system that can defend Japan against ballistic missile attacks.

After the North Korean missile launchings, Director-General Nukaga emphasized the need for early deployment of Japanese BMD systems, stating that the government would review the possibility of front-loading the buildup plan. For example, the Japanese government will consider earlier acquisition of Patriot PAC-3 (to be acquired by the end of FY 2006) and the Aegis BMD system (first vessel to be acquired by the end of FY 2007). Earlier deployment of the entire BMD system, which is currently planned for FY 2011, will also be considered. Furthermore, the government will review the possibility of moving up the deployment of FPS-XX radars and other radar networks.

The US Navy has deployed Aegis LRS&T destroyers (without interception capability) to the Sea of Japan since March 2004. In accordance with the decision of the Japan-US Security Consultative Committee (SCC or "2+2"), the US also deployed Aegis BMD cruisers equipped with interceptor missiles (SM-3) to the US Navy base at Yokosuka in August 2006. US Forces also deployed an X-band early warning radar to Shariki ASDF Base in Aomori in June, and a PAC-3 unit to the USAF base at Kadena, Okinawa by late 2006.

Needless to say, smooth joint operations are required between the Japanese and US BMD systems, and the procedures for ensuring such should be determined in detail. During his visit to Moscow in January 2006, Director-General Nukaga emphasized the importance of developing capabilities to detect ballistic missiles launches as quickly as possible, track the missiles accurately, and respond effectively. He also noted the necessity of developing monitoring systems that link Japan's ground-based radar network, Aegis ships, the JADGE system, early warning satellites, and US radar networks. Nukaga then revealed a plan to develop an integrated information network for Japanese and US ballistic missile defense.

The assets listed above that were deployed by US forces for monitoring the North Korean missile launches on July 5 were under the control of the US Pacific Command (PACOM) located in Hawaii.

However, the Japan Self-Defense Force's counterpart is the Headquarters of US Forces in Japan. Such an arrangement risks failure to share information, confusion, and delays in joint operations. The North Korean missile launches offer the lesson that Japan and the US need to fully coordinate regarding the positioning of US Forces in Japan and the development of operational procedures for Japan-US joint ballistic missile defense as soon as possible. Joint exercises and training will help reinforce lessons learned.

Electronic intelligence collection activities carried out by EP-3Cs of the Maritime Self-Defense Force and YS-11Es of the Air Self-Defense Force undoubtedly contribute to collecting and analyzing intelligence related to North Korea's ballistic missile activities, detecting launch indications, and maintaining the alert status of deployed units. The development of an intelligence collection system to support the operations of weapons systems is essential for the national security of Japan. It is expected that Japan will further develop intelligence collection capabilities for ballistic missile defense, including the possible introduction of aircraft such as US RC-135s for collecting data regarding missile launches.

However, airborne systems alone have operational limitations, so it is necessary also to contemplate the possible introduction of early warning satellites, and further reinforce human intelligence collection. Japan intends to seriously review the issue of the peaceful use of space, and in that context the possibilities for acquiring satellite-based capabilities to monitor ballistic missile activities has been discussed. If Japan were to possess the capabilities to detect ballistic missile launches and track the missiles immediately after launch, this would contribute to the operation of the BMD system as "active defense" as well as to appropriate implementation of "passive defense," including the protection of citizens and "damage confinement".

6. Growing Discussion on the Possession of "Denial Power"

Since the North Korean missile launch in July 2006, there has been growing discussion in Japan of acquiring an "offensive defense" power that would allow Japan to perform surgical strikes against an opponent's ballistic missile bases. On July 9, 2006, Director-General Nukaga stated that, "If it is necessary for protecting citizens, it is natural for Japan as an independent state to consider having a minimum capability, within a certain framework" and acknowledged the need to start examining the possibility of acquiring counterattack capability. Shinzo Abe, then Cabinet Secretary, also asserted the need to develop a plan for counterattacks on ballistic missile bases within the framework of the Japan-US alliance.

While some have expressed opposition to "offensive defense," they have not necessarily

distinguished between “preventive attacks,” “preemptive attacks” and “counterattacks,” and have argued that Japan should not even adopt the options of “preemptive attack” and “counterattack” both of which fall under the right to self-defense. They may have also confused “preemptive attacks,” which would be taken when there is a clear case of imminent attack, with the “preemptive actions” that the Bush administration has indicated would involve preventive attacks. Moreover, even those who expressed approval for the “preemptive attack” and “counterattack” concepts seemed to lack concreteness in discussing the required conditions for such attacks. Discussions in Japan about attacking enemy ballistic missile bases are still premature.

Nevertheless, it is significant that discussions about attacking enemy ballistic missile bases have been presented to the Japanese public following the North Korean missile launches. The next step would be to review exactly how to acquire the necessary offensive defense capabilities against ballistic missile attacks through consideration of various issues. Consideration must be given to the international situation, the enemy’s expressed intent, and the characteristics of the enemy’s ballistic missiles as well as one’s own offensive defense capabilities. It will also be important to distinguish between “preventive attacks” that are not recognized as part of the right of self-defense under current international law, and “preemptive attacks” and “counterattacks” which are recognized as such.

When discussions about counterattacks arose in Japan, China and South Korea immediately expressed concern. For example, a spokesperson from the South Korean Office of the President stated that the comments of Japanese ministers on counterattacks were challenging to the peace and stability of Northeast Asia and could not be tolerated. He further said that such remarks on preemptive attacks were dangerous and reckless and would further escalate the crisis on the Korean Peninsula, and that South Korea would strongly oppose attempts by Japan to become a growing military power.

However, no Japanese minister actually discussed “preemptive actions” or “preemptive attacks,” but merely noted what kinds of “counterattacks” are possible. Therefore, the comments from South Korea, which certainly has sufficient capability to “counterattack” against North Korea, is not persuasive at all and seemed merely to have some political intent. Still, if Japan does decide to acquire offensive defense capabilities, neighboring countries would likely show their opposition to such actions from political motives. If Japan does not clearly describe its concept for the possession of offensive defense capabilities to attack ballistic missile bases, then this would deteriorate the security situation around Japan. It is imperative to make considerable efforts in order to establish confidence among countries in the region, and abate their concerns.

7. Issues Concerning "Damage Confinement"

North Korea's ballistic missile launches in July 2006 also revealed the problem of delays in communicating information from the central government to local governments in Japan. While Japan has been developing a "citizen protection system", it was about three hours after the first missile launch before facsimile transmissions of this information were sent to the prefectural governments. It can be said of the Japanese government as well as the Japanese public as a whole that, despite increased interest in ballistic missile defense, issues related to the protection of citizens and "damage confinement" (passive defense and consequence management) draw less attention.

Since the ballistic missiles North Korea launched this time landed in the Sea of Japan near the Primorye Province of Russia, they did not cause any damage. However, Japan needs to review this case, and develop preparedness as soon as possible to deal with a future case in which missiles might land in Japanese territory. There will need to be procedures in place to declare warnings immediately, request emergency evacuation, keep citizens well-informed of necessary actions, establish coordination between the Self-Defense Forces, police forces, fire services, and the coast guard, and carry out operations by central and local governments and public corporations.

8. Establishing Robust and Effective Ballistic Missile Defense

Undoubtedly, the Japan-US relationship will be further strengthened through the development of Japan's ballistic missile defense system. Creating a framework within which mutually complimentary relationships can be built between Japan and the US at all levels is a challenging but extremely important task for Japan's public and private sectors.

Japan has been attempting to accelerate the development of its BMD system. Yet the threats that Japan faces come not only from ballistic missiles. This means that Japan needs to procure a variety of defense-related systems and that there needs to be a balance in their acquisition. Depending on developments in the security environment surrounding Japan, there may be a need to shift procurement focus to other capabilities in addition to the BMD system. In this case, the defense budget may need to be increased to allow acquisition of all needed defensive equipment. Considering the tense situations on the Korean Peninsula and in the Taiwan Strait as well as the rapidly modernizing and growing military power of China whose investment in defense has grown 10% per year for the last 18 years, there seems to be a growing need for Japan to increase its defense budget.

If the defense budget is not increased, then other expenses, such as the realignment of US Forces in Japan, could squeeze the budget for ballistic missile defense, resulting in the delay of BMD system development. This could also weaken the industrial and technical infrastructure of Japanese ballistic missile defense. Moreover, this would delay the development of a truly "multi-functional, flexible and effective" defense capability in Japan, which was set as a goal of defense build-up in the new National Defense Program Guideline.

The security environment surrounding Japan does not allow for an optimistic view, due to Japan's closeness to the Korean Peninsula and the Taiwan Strait. Thus, to maintain peace and prosperity, Japan needs to secure a sufficient defense budget to strengthen deterrence including, but not limited to, ballistic missile defense. It is time for the Japanese government to make serious efforts to obtain the understanding of the Japanese people about the appropriateness of increasing the budget for national defense, and for the immediate deployment of "offensive defense," "active defense" and "passive defense" capabilities related to BMD.

Part 1 Responding to Missile Threats

Chapter 1 Missile Threats and Responses by Specific Countries

1. Threats of Missile Attacks

A ballistic missile is "a generic term for missiles which are launched into outer space by rocket propulsion and use inertia to fly a ballistic trajectory through space."[1] There are several ways to classify ballistic missiles, but the most popular classification is the one using missile range. Missiles with a range shorter than 500 km are called Short Range Ballistic Missiles (SRBMs); those with a 500- to 3,500-km range are called Medium-Range Ballistic Missiles (MRBMs); those with a 3,500- to 5,500-km range are called Intermediate-Range Ballistic Missiles (IRBMs); and those with a 5,500-km or greater range are called Long-Range Ballistic Missiles (LRBMs). LRBMs launched from the ground are called Intercontinental Ballistic Missiles (ICBMs). In addition to ground-launched ballistic missiles, there are ballistic missiles launched from submarines (Submarine-Launched Ballistic Missile, or SLBMs) and from aircraft (Air-Launched Ballistic Missile, or ALBMs). So far, there has not been any actual deployment of ALBMs.

Some ballistic missiles can be loaded with not only conventional warheads but also with weapons of mass destruction (WMD), that is, nuclear, biological, or chemical warheads. As ballistic missiles that can be used to carry such WMD are relatively low in cost compared to other conventional weapon systems with equivalent capability, they tend to proliferate all over the world, especially in regions with frequent conflicts. At least 47 countries are said to possess ballistic missiles and, of these, the five nuclear-weapon states (the US, Russia, the UK, France and China) as well as India, Iran, Israel, North Korea, Pakistan, and Saudi Arabia possess missiles with ranges of 1,000-km or greater. Only the US, Russia and China deploy ICBMs, and all five nuclear-weapon states deploy SLBMs. Ballistic missiles are difficult to defend against because they fly long distances at very high altitude and velocity. Therefore, ballistic missiles have high military value as an effective method to attack hostile territory from a remote place. Moreover, some countries even regard ballistic missiles as a symbol of national power.[2] The ballistic missiles discussed above are all for ground attack, but the emergence of theater ballistic missiles (TBM) that can attack vessels such as aircraft carriers by using Maneuverable Re-entry Vehicle

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[1] Disarmament, Non-Proliferation and Science Department, Ministry of Foreign Affairs (ed.), *Japan's Disarmament and Non-Proliferation Policy* (3rd edition), Ministry of Foreign Affairs of Japan, 2006, p. 214 (in Japanese).

[2] Andrew Feickert, "Missile Survey: Ballistic and Cruising Missiles of Selected Foreign Countries," *CRS Report for Congress*, RL30427 (Updated July 26, 2005), p. 5.

(MaRV) is also expected.[3]

A cruise missile, on the other hand, is defined as "a missile with wings that uses intake propulsion to fly at a certain altitude and velocity until it reaches the target."[4] Unlike ballistic missiles, cruise missiles fly through the atmosphere under their own power, using a built-in guidance system to reach their targets. Also, cruise missiles are much smaller than ballistic missiles and have excellent stealth features, in addition to their extremely low flying altitude, to defy various sensors such as radars. Cruise missiles equipped with the latest precision navigation and guidance systems, such as US Tomahawks, have dramatically improved accuracy; thus many countries have increased interest in the possession and expansion of cruise missile capabilities.

More than 80 countries possess cruise missiles; among them 18 can produce such missiles. Cruise missiles can be classified by target type, such as Anti-Ship Cruise Missiles (ASCMs) and Land Attack Cruise Missiles (LACMs), or by launcher type, such as Air-Launched Cruise Missiles (ALCMs) and Surface-Launched Cruise Missiles (SLCMs). There are over 100 types of cruise missiles, including derivatives, with 70,000 to 80,000 deployed worldwide.

If these missiles are loaded with WMD, they can be "absolute weapons" that can cause enormous damage unless there are effective defense measures. They can be even greater threats to countries like Japan with concentrations of population, key infrastructure and assets in a narrow territory.

In addition, there are growing concerns of non-state actors such as international terrorist groups attaining and using WMD and missiles. Biological and chemical weapons do not require advanced technologies to manufacture, so that international terrorist groups can produce such weapons if they obtain the necessary knowledge and facilities. If non-state actors obtain weapon-grade fissile materials, especially highly enriched uranium, they may even be able to manufacture rudimentary nuclear weapons. The US, in particular, has grave concerns about the possibility of "rogue states" supplying WMD or related materials for their production to non-state actors. Another concern is the possibility of a coup d'état in a country possessing WMD that would hinder the control of such weapons and risk their outflow to international terrorist groups. Moreover, there are also concerns that international terrorist groups may load SRBMs or cruise

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[3] For example, see Ronald O'Rourke, "China Naval Modernization: Implications for U.S. Navy Capabilities—Background and Issues for Congress," *CRS Report for Congress*, RL33153 (November 18, 2005), p. 5

[4] Disarmament, Non-Proliferation and Science Department, *Japan's Disarmament and Non-Proliferation Policy*, p. 211 (in Japanese).

missiles onto container ships to launch against a target country's coastal areas.[5]

2. Background of Ballistic Missile Defense

At the end of World War II, the first ballistic missile V-2 rockets developed by Germany demonstrated the ability to attack the United Kingdom from German territory. The attacks highlighted the technical difficulty of intercepting ballistic missiles falling from an extremely high altitude at a great velocity. The United States concerned that the emergence of such ballistic missiles might negate its geo-political and strategic advantage of being isolated from the Eurasian continent. It began to develop ballistic missiles, and, at the same time, to study defensive measures to counter ballistic missile attacks. However, ballistic missile defense not only presented technical difficulties, but also faced political barriers to its development, especially during the Cold War. At that time, there were persistent and strong arguments that the development of ballistic missile defense might threaten mutual deterrence between the US and the Soviet Union, thereby being detrimental to the stability between the two superpowers.

This situation changed considerably after the end of the Cold War. While the confrontational relationship between the US and the Soviet Union had ended, WMD and ballistic missiles had proliferated throughout the Third World, and were recognized as a serious threat to the US and regional countries. The US was made keenly aware of the need for ballistic missile defense by the Gulf War of 1991. At that time, Iraq launched missile attacks using conventional warheads against multinational forces as well as Saudi Arabia and Israel. Although the damage caused by the missile attacks was limited, the US was forced to exert much effort in the search and destruction of Iraqi ballistic missiles and their mobile launchers.[6]

On the other hand, the US used its Patriot Advanced Capability-2 (PAC-2) missiles, originally designed for use against aircraft, in response to Iraqi ballistic missile attacks. While PAC-2 interception rates were much lower than first thought,[7] the deployment of PAC-2 provided a significant political and psychological effect in restraining Israel from retaliating against Iraq.

The US thus reconfirmed the threat of ballistic missile proliferation to US forces deployed for

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[5] See, for example, United States of America, *The National Strategy for Maritime Security*, September 2005, p. 8.

[6] See W. Andrew Terrill, "The Gulf War and Ballistic Missile Proliferation," *Comparative Strategy*, Vol. 11, No. 2 (1992), pp. 166-169.

[7] See John Conyers, Jr., "The Patriot Myth: Caveat Emptor," *Arms Control Today*, Vol. 22, No. 9 (November 1992). Theodore A. Postol and Robert M. Stein had an intense debate on the Patriot's interception rate. See Theodore A. Postol, "Lessons of the Gulf War Experience with Patriot," *International Security*, Vol. 16, No. 3 (Winter 1991/92), pp. 119-171; Robert M. Stein and Theodore A. Pistol, "Correspondence: Patriot Experience in the Gulf War," *International Security*, Vol. 17, No. 1 (Summer 1992), pp. 199-240.

regional conflicts, and re-emphasized the need for ballistic missile defense to ensure US influence and protect the military operations of the US and its allies.[8] Compared with the Soviet Union during the Cold War, there seem higher probabilities that Third World countries would actually use ballistic missiles, so the US and its allies, such as Japan, are pressed to develop a ballistic missile defense system. Although there still exist technological barriers, achievement attained especially through research and development under the Strategic Defense Initiative (SDI) promoted by the Reagan administration during the Cold War provided the foundation for a breakthrough in the feasibility of ballistic missile defense.

The ballistic missile defense first planned during the US-Soviet confrontation of the Cold War era has been developed with the main purpose of defending the US homeland, US forces deployed overseas and US allies and friends against ballistic missile attacks from Third World countries, especially rogue states, after the Cold War.

3. US Ballistic Missile Defense Initiatives

1) ABM

The US began to study ballistic missile defense during the final stages of the Second World War, and intensified such studies upon the Soviet launch of Sputnik in 1957 and its acquisition of ICBMs that could reach the US homeland from Soviet territory. To defend their homelands from strategic ballistic missile attacks, both the US and the Soviet Union pursued the development of Anti-Ballistic Missiles (ABMs) that could destroy enemy nuclear warheads by exploding the ABMs' nuclear warheads in the vicinity of the attacking missiles. The US started to develop Nike-Zeus in 1958, and Nike-X in 1963. However, both the Eisenhower and Kennedy administrations were rather cautious in their actual deployment. The Soviet Union, on the other hand, deployed ABMs with nuclear warheads near Moscow.

The Johnson administration renamed the Nike-X Sentinel and decided to deploy them in September 1967. The purposes of this deployment were to pressure the Soviet Union to engage in arms control negotiations on strategic weapons, and to answer the calls of proponents of ABM in Congress. The Nixon administration then announced in March 1971 that it would discontinue the deployment of Sentinels, but would deploy a Safeguard ABM system to defend ICBM bases. The Safeguard system would consist of two types of interceptor missiles — Spartans to intercept missiles in outer space and Sprints to intercept them in the atmosphere. This announcement reflected the strong intent of the US to utilize ABM as a bargaining chip in the Strategic Arms

[8] Thomas G. Mahnken, "The Arrow and the Shield: U.S. Responses to Ballistic Missile Proliferation," *The Washington Quarterly*, Vol. 14, No. 1 (Winter 1991), p. 199.

Limitation Talks (SALT) then ongoing with the Soviet Union.

In June 1972, the US and the Soviet Union concluded the ABM Treaty in which each side agreed to limit the number of its interceptor missiles to 100; to have one limited ABM system to protect its capital and another to protect an ICBM launch area (reduced to one site in 1974); and to prohibit the development and deployment of ABM systems except fixed land-based systems. The US started to operate its Safeguard system at its ICBM base in North Dakota in October 1975. However, in February 1976, it discontinued operation since the system required the detonation of nuclear warheads within US territory and was considered ineffective in terms of cost and technology. From that time, the US down-scaled its ballistic missile defense program, but continued to study interception methods that could neutralize nuclear warheads without using nuclear warheads for interception.

2) SDI and GPALS

In March 1983, President Reagan directed "a comprehensive and intensive effort to define a long-term research and development program to begin to achieve our ultimate goal of eliminating the threat posed by strategic nuclear missiles."[9] Later this program was named the Strategic Defense Initiative (SDI). In December 1984, he also stated that "in the long-term, … SDI will be a crucial means by which both the US and the Soviet Union can safely agree to very deep reductions, and eventually, even the elimination of ballistic missiles and the nuclear weapons they carry."[10] On the other hand, it was pointed out that to attain such purposes, it would be necessary to reinforce air and civil defense systems, as well as strengthen non-nuclear forces in addition to ballistic missile defense.[11]

The SDI aimed to achieve Multi-Layered Defense, which would intercept Soviet strategic missiles at various phases of ballistic missile flight, i.e. the boost phase, the post-boost phase, the mid-course phase, and the terminal phase, by interceptor systems deployed on the ground and in space as well as onboard aircraft. Interception at boost phase was later nicknamed "Star Wars," since it emphasized the need to launch interceptor weapons into space.

In addition, research and development was pursued on directed energy weapons using lasers and

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[9] Ronald Reagan, "Address to the Nation on Defense and National Security," March 23, 1983. For the analysis of this speech, see Gordon R. Mitchell, *Strategic Deception: Rhetoric, Science, and Politics in Missile Defense Advocacy* (East Lansing, Michigan: Michigan State University Press, 2000), pp. 52-56.
[10] Ronald Reagan, "Foreword Written for a Report on the Initiative, December 28, 1984."
[11] See Leon Sloss, "The Strategist's Perspective," Ashton B. Carter and David N. Schwartz (eds.), *Ballistic Missile Defense* (Washington D.C.: Brooking Institution, 1984), p. 46.

particle beams, and kinetic energy weapons that would destroy ballistic missiles and their warheads by a direct hit.[12] According to the SDI deployment plan issued in September 1986 by the Strategic Defense Initiative Office (SDIO), the first phase of SDI deployment would include several hundred launchers in space for kinetic energy weapons, and several hundred to several thousand ground-based interceptor missiles in order to deter Soviet preemptive attacks against US ICBMs.[13]

SDI caused a sensation both in and outside the US. The reasons were not only that SDI would require a huge budget and that its feasibility was doubtful given the technology at that time but also that, if realized, it would have the potential to radically change the US and the Soviet deterrence postures, which relied on a balance of offensive forces. [See Chapter 9 of this book.] Thus SDI provoked extensive argument on whether it would or would not benefit strategic stability between the US and the Soviet Union, and whether it would infringe upon the ABM Treaty. It had a significant impact on the direction of strategic nuclear arms control negotiations.

On the other hand, we must not overlook the strategic significance of SDI. At the very least SDI undoubtedly induced the Soviet Union to enter nuclear arms control negotiations. Moreover, SDI was one of the factors that led the Soviet Union to give up confrontation with the US and bring an end to the Cold War.[14]

The first Bush Administration indicated its intent to pursue SDI.[15] In the "first phase" of SDI re-defined in 1990, the plan was to deploy 4,600 Brilliant Pebbles (space-based kinetic energy weapons) and 1,000 to 2,000 ground-based interceptor missiles.[16] However, the first Bush Administration was not necessarily eager to actively promote SDI, and Congress also tried to slow SDI by drastically cutting funding for the space-based interceptor system. Behind these actions were the end of the Cold War and a significant reduction of the threat of massive nuclear attack

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[12] For the interception system planned in SDI, see Stephen Weiner, "Systems and Technology," Carter and Schwartz, *Ballistic Missile Defense*, pp. 49-97; Michael May, "Technical Feasibility of the SDI," Samuel F. Wells, Jr. and Robert S. Litwak (eds.), *Strategic Defenses and Soviet-American Relations* (Cambridge, Massachusetts: Ballinger Publishing Company, 1987), pp. 125-140.

[13] Regarding the summary of "the first phase" of SDIO, see Ballistic Missile Defense Organization, Department of Defense, *Harnessing the Power of Technology: The Road to Ballistic Missile Defense from 1983-2007*, September 2000, pp. 22-25.

[14] Former Foreign Minister of the Soviet Union Aleksandr Aleksandrovich Bessmertnykh stated that the end of the Cold War was brought about by President Reagan's SDI. See *The Sankei Shimbun*, March 1 1993 (in Japanese). On the other hand, there were some criticisms of such a view. See, Mitchell, *Strategic Deception*, pp. 87-93 for the summary of those argument.

[15] George H. W. Bush, "Address on Administration Goals before a Joint Session of Congress," February 9, 1989.

[16] Tetsuya Umemoto, "Development of National Missile Defense" Satoshi Morimoto (ed.), *Missile Defense: The New Structure of International Security* (Tokyo: Japan Institute of International Affairs, 2002), p. 40 (in Japanese).

against the US because of improved US-Soviet relations.

On the other hand, regional conflicts contained during the Cold War were re-emerging with increasing frequency and intensity. Some Third World countries that would be involved in such conflicts possessed chemical and biological weapons as well as ballistic missiles to carry them. Thus, the US perceived that it would need to defend its forces from ballistic missiles if it were to intervene in regional conflicts. In 1991, the same year as the Gulf War, the US passed the Missile Defense Act, which set a US goal of deploying an effective ballistic missile defense system against limited strategic ballistic missile attacks, while maintaining the strategic stability. This Act stipulated that the US should develop, by fiscal 1996, a ballistic missile defense system that would not violate the ABM Treaty, and that the President should ask the Soviet Union to revise the ABM Treaty.

The State of the Union Address by President Bush in January 1991 directed that "the SDI program be refocused on providing protection from limited ballistic missile strikes, whatever their source."[17] This ballistic missile defense program was named "Global Protection Against Limited Strike" (GPALS). GPALS planned to deploy 24 Brilliant Eyes satellites with warning and guidance systems, about 1,000 Brilliant Pebbles, a Theater (later renamed to "Terminal") High Altitude Area Defense (THAAD) system, and 500 to 1,000 Patriot Advanced Capability-3 (PAC-3) ground-based interceptors. The main purpose of GPALS was to defend against ballistic missiles used by Third World countries, as well as accidental or unauthorized launches of ballistic missiles.[18]

3) TMD and NMD

The Clinton Administration started to review ballistic missile defense policies shortly after coming into office in 1993. To confront new post-Cold War threats, it placed priority on Theater Missile Defense (TMD) to defend US forces deployed abroad as well as allies and friends from ballistic missile attacks. Following TMD, the next priority was given to National Missile Defense (NMD) to defend the US homeland. The Clinton Administration announced that SDIO would be reorganized as the Ballistic Missile Defense Office (BMDO), and determined that the focus of BMDO would be shifted from space-based to ground-based and sea-based plans.[19] This policy of

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[17] George H. W. Bush, "Address Before a Joint Session of the Congress on the State of the Union," January 29, 1991.
[18] For a summary of GPALS, see Ballistic Missile Defense Organization, Department of Defense, *Harnessing the Power of Technology: The Road to Ballistic Missile Defense from 1983-2007*, September 2000, pp. 25-28.
[19] Les Aspin, "The End of the Star Wars Era," Department of Defense News Briefing, Office of the Assistant Secretary of Defense, May 13, 1993 [http://www.fas.org/spp/starwars/offdocs/d930513.htm].

prioritizing TMD continued until the middle of 1998.

The Clinton Administration's TMD program was structured on the altitude and deployment of ballistic missile interceptors. In terms of interception altitude, there was lower-tier defense to intercept missiles within the atmosphere at altitudes of 100 km or below, and upper-tier defense for interception in the upper atmosphere and outer space 100 km or higher.

Lower-tier defense was to use the PAC-3 missile, the Medium Range Extended Air Defense System (MEADS), and sea-based Navy Area Defense (NAD) to intercept ballistic missiles of less than 1,500 km range, as well as cruise missiles and aircraft. The upper-tier defense system was to intercept ballistic missiles with ranges up to 3,500 km with ground-based THAAD and sea-based Navy Theater Wide Defense (NTWD). In addition, the TMD program included a system to intercept ballistic missiles at the boost phase using an Airborne Laser (ABL) system with laser beams launched from aircraft, and boost phase interceptor missiles that would use kinetic energy weapons.

The Clinton Administration program was divided into core programs for early deployment, and advanced concepts to potentially complement the core programs. The core programs would start with PAC-3, THAAD, and NAD, with NTWD added from 1997. The plan was to deploy PAC3 from 1998, THAAD from 2001, and NAD from 1999. In 1997, however, the program was altered to postpone deployments of PAC-3 to 1999, THAAD to 2004, and NAD to 2002.[20]

Ballistic missile defense policies were drastically changed in response to the "Rumsfeld Report" in July 1998. This report clearly indicated that rogue states such as North Korea and Iran would possess ballistic missiles capable of hitting the US homeland within about five years of a decision to acquire such a capability while US intelligence community's ability to provide timely and accurate estimates of ballistic missile threats to the US was eroding.[21] Immediately afterward, in August 1998, North Korea tested the Taepo Dong (1), an IRBM with a range of 2,000 to 4,000 km, which flew over the north-eastern region of Japan. The test evidently confirmed the Rumsfeld Report and provided an opportunity for the US to review NMD's priority.

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[20] On the Clinton Administration's TMD program, see BMDO, *1994 Report to the Congress on Ballistic Missile Defense*, July 1994; BMDO, *1995 Report to the Congress on Ballistic Missile Defense*, September 1995; BMDO, *1997 Report to the Congress on Ballistic Missile Defense*, September 1997; Robert Shuey, "Theater Missile Defense: Issues for Congress," *CRS Issue Brief for Congress*, IB98028 (Updated May 22, 2001), pp. 1-9.

[21] Members of the Commission to Assess the Ballistic Missile Threat to the United States, *Executive Summary of the Report of the Commission to Assess the Ballistic Missile Threat to the United States*, Pursuant to Public Law 201, 104th Congress, July 15, 1998 [http://www.fas.org/irp/threat/bm-threat.htm].

In addition to a changed recognition of threats, there were other factors driving the push for NMD. Congressional Republicans were highly critical of the Clinton Administration's inertia on NMD, while the Democrats' support for NMD had increased, and the administration's reluctance to promote NMD was seen as placing the Democrats at a disadvantage for the 2000 election. Therefore, the Clinton Administration decided to promote "limited" NMD. The 1999 Defense Report clearly stated that NMD should have a priority similar to that of TMD.[22] The 1999 National Missile Defense Act stipulated that "[i]t is the policy of the US to deploy as soon as is technologically possible an effective National Missile Defense system capable of defending the territory of the US against limited ballistic missile attack (whether accidental, unauthorized, or deliberate) with funding subject to the annual authorization of appropriations and the annual appropriation of funds for National Missile Defense."

The NMD program of the Clinton Administration was to deploy, phase by phase, a ground-based mid-course NMD system that could intercept missiles using the impact of interceptors in outer space. Under this program, the first phase "Capability 1" would deploy 20 interceptor missiles in Alaska by 2005, and then increase the number of interceptors to 100 by 2007 under "Capability 1 expansion." In the "Capability 2" phase, the number of interceptors would be the same as for the "Capability 1 expansion" but X-band radar coverage would be increased by 2010, and in the "Capability 3" phase 260 interceptor missiles would be deployed to Alaska and Grand Forks (North Dakota) by 2011.[23]

By the summer of 2000, the Clinton Administration was about to make a decision on NMD deployment based on four criteria: threats, technological feasibility, cost, and effects on national security, including arms control. However, due to NMD test failures and the administration's lack of success in gaining Russian and Chinese acceptance of the NMD deployment, President Clinton eventually said in September 2000, "I simply cannot conclude, with the information I have today, that we have enough confidence in the technology and the operational effectiveness of the entire NMD system to move forward to deployment. Therefore, I have decided not to authorize deployment of a national missile defense at this time." [24]

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[22] William S. Cohen, Secretary of Defense, *Annual Report to the President and the Congress*, 1999 [http://www.defenselink.mil/execsec/adr1999/chap6.html].
[23] Congressional Budget Office, "Budgetary and Technical Implication of the Administration's Plan for National Missile Defense," *CBO Paper*, April 2000 [http://www.fas.org/spp/starwars/congress/2000_r/000425-cbo-nmd.htm].
[24] "Remarks by the President on National Missile Defense," Georgetown University, Washington, D.C., September 1, 2000 [http://www.ceip.org/files/projects/npp/resources/PresidentdelaysNMD.htm].

4) MD

President Bush stated in his address of May 1, 2001 at the National Defense University that Russia was no longer an enemy, and that the most imminent threat was attack from rogue states using weapons of mass destruction and ballistic missiles. To respond to such new threats, according to the speech, the US must abandon traditional deterrence relying solely on offensive nuclear capabilities in favor of new concepts of deterrence that rely on both offensive and defensive forces. President Bush also stated that the US would need a new framework that allows it to build missile defenses, and must move beyond the constraints of the 30-year-old ABM Treaty.[25]

At that time, the Bush Administration removed the distinction between NMD and TMD in ballistic missile defense and termed it Missile Defense (MD). [Hereinafter, the ballistic missile defense initiative of the Bush Administration will be termed "MD."]

The outline of the Bush Administration's MD was disclosed through the Congressional testimony of BMDO Director Ronald Kadish in July 2001.[26] Kadish first pointed out that the Bush Administration would aim for layered defense to intercept hostile ballistic missiles at the boost, mid-course, and terminal phases, using kinetic energy and directed energy MD systems deployed on sea, on land, in air and in space. He further stated that the US would seek broader-ranged activities in the assessment and development of MD technologies.

The most notable feature of the Bush Administration's MD system is the division of the entire system into three segments of interception — boost, mid-course and terminal. The system for the boost phase includes kinetic energy and directed energy weapons; the core programs for kinetic interceptors includes space- and sea-based missile systems. Directed energy systems include ABL and the Space-Based Laser (SBL). For the mid-course segment, the main systems are the ground-based interceptor that was central to the NMD program of the Clinton Administration, and a sea-based system (Aegis BMD) that was renamed NTWD. The terminal segment includes PAC-3, THAAD and NAD.

The terrorist attacks of September 11, 2001 (9/11) clearly demonstrated the vulnerability of the US homeland not only from longer-range ballistic missile attacks, but also from terrorist attacks using

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[25] George W. Bush, "Remarks by the President to Students and Faculty at National Defense University," Fort Lesley J. McNair, Washington D.C., May 1, 2001 [http://www.whitehouse.gov/news/releases/2001/05/20010501-10.html].

[26] Ronald T. Kadish, Director, Ballistic Missile Defense Organization (BMDO), "The Ballistic Missile Defense Program," prepared testimony on ballistic missile defense policies and programs in review of the Defense Authorization Request for Fiscal Year 2002, United States Senate Committee on Armed Services, July 12, 2001.

different means. Moreover, it became clear that the latter threat would be more real to the security of the US. Therefore, the 9/11 terrorist attacks proved the importance of homeland defense, which culminated in the establishment of the Department of Homeland Security. Since this move emphasized the US security situation, in which real threats could occur anywhere at anytime, the Bush Administration has shown no sign of slowing down the promotion of MD; in its Quadrennial Defense Review (QDR) Report published in September 30, 2001, the administration emphasized the importance of MD in view of ballistic missile proliferation expanding on a scale greater than previously expected.[27]

The Bush Administration moved to further promote MD and, on December 13, 2001, formally notified Russia that the US would be withdrawing from the ABM Treaty effective six months later. In January 2002, BMDO was renamed the Missile Defense Agency (MDA), underlining the resolution of the Bush administration to promote MD.

Congressional testimony in February 2002 by MDA Director Kadish stated that the overall structure of the MD system would undergo periodic review, but that its initial target would be to provide a limited defense against the threat of longer-range ballistic missiles between the years 2004 and 2008.[28]

Concerning MD procurement, Kadish pointed out the need for continuous assessment of technologies and alternative approaches to MD capabilities, and emphasized pursuit of MD under "capability-based acquisition" in which improved technologies and products would be procured in two-year blocks. The advantage of capability-based acquisition is its flexibility in procuring a complex system that needs to integrate the most advanced technologies, while allowing the immediate deployment of BMD systems that can be upgraded as soon as advanced technologies become available. Therefore, this procurement system would enable early deployment of a system with limited but effective capabilities.

On December 17, 2002, President Bush announced that the US would start operating initial MD capabilities within the period 2004-06. Initial defense capability would consist of 20 Ground-Based Mid-Course Defense (GMD) interceptor missiles (16 located at Fort Greeley in Alaska, and four at Vandenberg Air Force Base in California), 20 Sea-Based Mid-Course Defense (SMD) (SM-3 missiles on Aegis ships), and Ground-Based Terminal Defense (GTD) interceptors

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[27] See Department of Defense, *Quadrennial Defense Review Report*, September 30, 2001, pp. 6-7, 18, 25.
[28] Ronald T. Kadish, Director, Missile Defense Agency (MDA), "Statement," before the Military Procurement Subcommittee and Military Research and Development Subcommittee, House Armed Services Committee, February 27, 2002.

(PAC-3).[29]

Based on the above program, the first GMD interceptor missiles were deployed to Fort Greeley in July 2004. In July 2006, at the time of North Korea's Taepo Dong 2 launch, there were 11 GMD interceptor missiles deployed (9 at Fort Greeley, two at Vandenberg), that were switched from "test mode" to "active service" upon the Taepo Dong 2 launch. Since none of the seven ballistic missiles launched, including the Taepo Dong 2, flew over Japanese territory, the interception system did not seem to have been placed in the ready position. Meanwhile, in October 2004, the first SMD missiles on Aegis ships were delivered. The MD program calls for 15 Aegis destroyers with early detection and track capabilities and 3 Aegis cruisers with actual interception capability to be deployed in various maritime regions.[30]

In relation to this, the US Navy announced in March 2004 that it would permanently deploy two Aegis destroyers to the Sea of Japan for early warning of ballistic missile launches from North Korea.[31] The final report of SCC ("2+2") between Japan and the US held in May 2006 recommended the deployment of one Aegis cruiser with interceptor missiles and PAC-3s to Okinawa, and one X-Band radar to Aomori.

As for the GTD, PAC-3s were the most advanced in their development, so their procurement and deployment proceeded first. They were actually used during the Iraq War of 2003, and were reported to have successfully intercepted two Iraqi al-Samoud SRBMs.[32]

Upon North Korea's ballistic missile launches in July 2006, the US deployed RC-135Ss (Cobra Ball), electronic reconnaissance aircraft designed specially to monitor and track ballistic missiles, to Kadena Base, and the missile monitoring ship "Observation Island" as well as Aegis destroyers to Sasebo, and started operation of the X-band radar deployed to Shariki Base from June 26, days

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[29] George W. Bush, "Presidential Announces Progress in Missile Defense Capabilities," Statement by the President, December 17, 2002 [http://www.whitehouse.gov/news/releases/2002/12/20021217.html]; U.S. Department of Defense, "Missile Defense Operations Announcement," *News Release*, December 17, 2002 [http://www.defenselink.mil/news/Dec2002/b12172002_bt642-02.html]; Ronald Kadish and J. D. Crouch, "Missile Defense Deployment Announcement Briefing," December 17, 2002 [http://www.defenselink.mil/news Dec2002/t12172002_t1217missiledef.html]. On the other hand, for criticism of the decision, see Joseph Cirincione, "Bush's Folly," *Carnegie Analysis*, Carnegie Endowment for International Peace, December 18, 2002 [http://www.ceip.org/files/nonprolif/templates/article.asp?NewsID=4114]. Also, other analysis indicated that the operational start of the US missile defense system will be in the year 2010 or later, except in the case of PAC-3. See Philip Coyle, "Rhetoric or Reality?: Missile Defense under Bush," *Arms Control Today*, Vol. 32, No. 4 (May 2002) [http://www.armscontrol.org/act/2002_05/coylemay02.asp].

[30] Kensuke Ebata, "How Advanced is Ballistic Missile Defense?", *Sekai Shuho*, August17-24, 2004, p. 22 (in Japanese).

[31] Ibid., p.20-21.

[32] Ibid., p.24.

before the originally planned operation date. Through these measures, including early warning satellites already in place, the US established a sufficient multi-layer system to track missiles launched from North Korea. The US also stated its intent to deploy Aegis cruisers equipped with SM-3 missiles to Yokosuka by the summer of 2006, and the PAC-3 to Kadena Base in Okinawa before the end of 2006.

The US FY2007 Defense Budget included 10.4 billion dollars for MD related expenditures (from 8.8 billion dollars for FY2006). Moreover, 4 billion dollars are to be spent by FY2011 to improve space-based early warning systems.[33]

4. Responses of Other Countries to Ballistic Missile Defense

In 1985, the US invited its allies and friends to join the SDI. Those countries that accepted the US invitation participated in joint R&D projects. In addition, many countries are now cooperating in such efforts as the Bush Administration further promotes the advancement of MD development (the ballistic missile defense cooperation between Japan and US will be further discussed in chapters 4 to 7).

Germany, France, Italy and the US began Theater Missile Defense Architecture Studies (TMDAS) in 1987 and agreed to develop MEADS as an air defense system with TMD capability in February 1995 (France later withdrew from this agreement[34]).

The US argued for TMD efforts under NATO, and in 1993 the "Special TMD Working Group with Expanded Air Defense" was established to review cooperation in ballistic missile defense. In 1995, the Missile Defense Ad Hoc Group (MDAHG) was established to study technological feasibility and the concept of technological content.[35]

The feasibility study of Active Layered Theatre Ballistic Missile Defense (ALTBMD) continued from 2001 until 2004, with studies on how to defend the NATO troops deployed within the NATO region from ballistic missiles, and the NATO decided in February 2005 to deploy ALTBMD. In addition, during the Prague Summit in November 2002, the leaders of 19 NATO member countries

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[33] *The Sankei Shimbun*, February 9, 2006.
[34] At first, France showed strong interest in ballistic missile defense. See, for example, Henri Conze, "Transatlantic Cooperation on Missile Defense: A French Perspective," *Comparative Strategy*, Vol. 14, No. 4 (1995), pp. 431-441.
[35] On the TMD cooperation with European NATO member countries and NATO itself, see Kensuke Ebata, "Missiles Defense in Europe and Russia" Satoshi Morimoto (ed.), *Missile Defense: The New Structure of International Security* (Tokyo: Japan Institute of International Affairs, 2002), pp. 195-199 (in Japanese); BMDO, *1997 Report to the Congress on Ballistic Missile Defense*, chapter 7, pp. 2-3.

agreed to implement a NATO Missile Defense Feasibility Study, which took place from January 2004 until June 2005. Upon North Korea's missile launches in July 2006, NATO accelerated its study of introducing a missile defense system capable of defending all Europe since it perceived that the threat of missile proliferation from North Korea to the Middle East had been heightened further. NATO has started talks, and is likely to set the direction for introducing missile defense systems by the Summit Meeting in November 2006.[36]

At present, bilateral MD cooperation is developing between the US and European countries. The United Kingdom approved the improvement of early warning radar located at Fylingdales Base, as the US requested. Denmark also agreed to improve the capability of early warning radar at the US base in Thule, Greenland in 2004. Poland is continuing dialogue with the US on accepting an MD base to defend the US homeland. If implemented, it will be beneficial not only to the defense of the US but also to that of Europe as a whole. However, there are some opposing opinions in Poland, Russia has expressed concerns, and other East European countries are indicating their unease, so it is not clear how this proposal will take shape in the future.

Despite the progress in MD cooperation with other countries, one country that has not been positive is Canada. Although it revised its agreement with the US in June 2004 to allow use of information gathered at the North American Aerospace Defense Command (NORAD), it declared in February 2005 that it would not participate in the US MD framework.

In addition to European countries, the US and Israel continue joint development of the Arrow missile through economic and technological assistance from the US, which begun during the time of SDI.[37] Work on an improved Arrow II system entered the deployment phase in March 2003, but both countries continue joint research on improvements, testing, and manufacturing. Australia decided to participate in the US MD in December 2003 (in July 2004, it signed an MD Framework MOU with the US), and approved the establishment of a missile launch monitoring facility (Pine Gap) in Australia, which will help US homeland defense. The immediate issues for Australia will be how to provide MD capabilities, including the development and testing of Over-the-Horizon (OTH) radars, and Modeling and Simulation (M&S), as well as the installation of Aegis sensor equipment on Australian destroyers.[38]

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[36] *Yomiuri Shimbun*, July 13, 2006 (morning edition).
[37] See Ebata, "Missiles Defense in Europe and Russia" pp. 182-187; BMDO, *1997 Report to the Congress on Ballistic Missile Defense*, chapter 7, p. 4
[38] On MD cooperation between the US and allied or friendly countries, see Japan Defense Agency, *Defense of Japan, 2005*, pp. 154-155; Paula A. DeSutter, Assistant Secretary for Verification, Compliance, and Implementation, "State Department's Role in Missile Defense," Remarks at the National Defense University Foundation Congressional Breakfast Seminar Series, Washington D.C., April 4, 2006 [http://www.state. gov/

As mentioned before, Russia has continued efforts to develop BMD systems since the Cold War era. The Soviets deployed the world's first ballistic missile defense system, A-350 (Galosh), in Moscow in 1964. Even after the collapse of the Soviet Union, improved A-350s (called A-135s) are still positioned to defend the capital. However, Russia may face problems in continuing A-135 deployment due to economic difficulties. These nuclear-capable ABMs are designed to counter nuclear-armed ballistic missiles at very high or low altitudes. In addition to these ABMs, Russia has S-300 BMD-capable air defense missiles, developed since the Soviet era.[39]

Among Asian countries, South Korea announced its "non-participation in TMD" in March 1999. It is true that even if South Korea deploys an upper-tier defense system such as THAAD and NTWD, it would not have any military significance in relation to North Korea, as threats from North Korea are from long-distance artillery and SRBMs that are difficult for upper-tier systems to counter. Moreover, it was pointed out that, if South Korea introduces upper-tier defenses, China may consider it a measure to defend against Chinese MRBM and IRBM attacks. In other words, although South Korea has not eliminated the possibility of introducing the PAC-3 lower-tier defense system, South Korea seems more concerned with China's reaction to its participation in TMD. Believing that the term "TMD" itself has a strong implication of anti-China sentiment, South Korea may have given consideration to China's concerns regarding TMD.[40]

China has been continuously critical of the efforts of Japan and the US to promote BMD, but they themselves have deployed Hong Qi 10 (SA-10) and Hong Qi 18 (SA-12) air defense missiles imported from Russia or manufactured under license from Russia, which are said to have the capability, though limited, to intercept short- to medium-range ballistic missiles. Moreover, China is said to be planning the deployment of the Russian S-300PMU-2 by September 2006.[41] In March 2006, the official PLA bulletin reported a successful test of interceptor missiles similar to the US Patriot.

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t/vci/rls/rm/64126.htm].

[39] Ebata, "Missiles Defense in Europe and Russia", pp. 178-182.

[40] Hidenari Kurata, "Missile Defense and South Korea: Its Selective Introduction and 'Missile Unbalance,'" Satoshi Morimoto (ed.), *Missile Defense: The New Structure of International Security* (Tokyo: Japan Institute of International Affairs, 2002), pp. 138-139 (in Japanese). For South Korean attitude and responses, see also A Henry L. Stimson Center Working Group Report, "Theater Missile Defenses in the Asia-Pacific Region," *Report*, The Henry L. Stimson Center, No. 34 (June 2000), pp. 33-36; Michael J. Green and Toby F. Dalton, "Asian Reactions to U.S. Missile Defense," *NBA Analysis*, The National Bureau of Asian Research, Vol. 11, No. 3 (November 2000), pp. 21-25.

[41] Martin Walker, "China's Defense Challenge," *UPI*, May 26, 2006 [http://www.spacewar.com/reports/Chinas_Defense_Challenge.html].

Located within the range of Chinese SRBMs, Taiwan has submitted to its Parliament a proposal to purchase PAC-3s from the US. However, for political reasons this proposal has faced strong opposition from the KMT. Taiwan has also asked the US for BMD-capable Aegis ships, but been refused.

Considering the number of SRBMs China possesses and the geographical proximity of China and Taiwan, the significance of BMD systems such as PAC-3s may be limited in a military sense, but the deployment of such weapons may be significant in demonstrating Taiwan's determination to resist military pressure from China. Once Taiwan acquires BMD systems, the US will necessarily share the burden of their operation. This may bring a "virtual military alliance" between the US and TaiwanB—exactly the point of China's concern.

5. Cruise Missile Defense

How are countries addressing cruise missile defense? Ever since the Israeli destroyer "Eilat" was sunk by four short-range Egyptian anti-ship missiles in October 1967, navies all over the world have made extensive efforts to develop defenses from anti-ship missiles, including anti-ship cruise missiles. Today, modernized navies have achieved some capabilities in anti-ship missile defense. However, for defense from land-attack cruise missiles, even the US, which has the world's strongest cruise missile capability (Tomahawks), has not done much in terms of cruise missile defense studies. Needless to say, Japan and other countries have lagged behind and hardly conducted any such study.

Today, most cruise missiles around the world are ASCMs. Many of them are Russian Styx, Chinese CSSC-2 (Silk Worm), and their derivatives, which are rudimentary anti-ship missiles with shorter range, slower velocity, and simple guidance systems. Although rogue states possess cruise missiles, most of them are such ASCMs.

The SS-N-22 (Sunburn) that Russia supplies to China is an ASCM (that could possibly be used as an ALCM or SLCM) with super-high velocity and excellent stealth. As they fly at very low altitude, it is difficult to detect them, thereby posing a significant threat to modern surface combatants, including US aircraft carriers and Aegis ships.

In terms of LACMs with 1,000 km or longer range, only the US and Russia possess such weapons today. Yet several countries, including China, are undertaking development plans for them, so

the number of LACM-capable countries will likely increase.[42]

In its National Information Estimate of 2001, the US predicted that 10 to 20 countries are likely to possess LACM capabilities by 2015.[43] Such LACMs have greater precision attack capabilities and longer ranges through the application of advanced technologies such as Global Positioning System (GPS) guidance. Countries having difficulties in obtaining such advanced technologies have started to use ASCMs for land attacks. Iraq, for example, used Chinese CSSC-3s during the 2003 Iraq War.

With the accelerated pace of proliferation and potential for effective attacks, cruise missile threats are expected to grow further. Therefore, it will become more important to address cruise missile defense as well as ballistic missile defense. At the moment, however, the highest priority for Japan and the US is ballistic missile defense; cruise missile defense remains a ways behind.
[Cruise missile defense will be discussed further in Part 3, Chapter 13.]

[42] In regards to the possession of cruising missiles, see Thomas G. Mahnken, *The Cruising Missile Challenge* (Washington D.C.: Center for Strategic and Budgetary Assessments, 2005), pp.9-23.
[43] National Intelligence Council, *Foreign Missile Developments and the Ballistic Missile Threat Through 2015*, Unclassified Summary of a National Intelligence Estimate, December 2001, p.14.

Chapter 2 Missile Threats to Japan

1. Security Environment of Japan

With the end of the Cold War and the collapse of the Soviet Union, the bipolar structure led by the US and Soviet Union ended, and the threat of Russia was drastically reduced in Northeast Asia. Moreover, since the end of the Cold War, interdependence, mainly in economic issues, has increased among the East Asian countries. In terms of security, the region's countries have also promoted confidence-building measures, particularly since the establishment of the ASEAN Regional Forum (ARF) in 1994.

However, the security environment in Northeast Asia is not necessarily heading in a favorable direction. Regional confrontations that used to be controlled under the US-Soviet bipolar structure have become more apparent than ever, while new confrontational relationships emerge. The Korean Peninsula and the Taiwan Strait remain divided since the Cold War, and tensions there have risen from time to time. In Northeast Asia, there are still several unresolved territorial disputes among Japan and surrounding countries, including the Northern Territories, Senkaku Islands, and Takeshima.

China is busily engaged in activities to secure natural resources that are for sustaining its rapid growth, including aggressive approaches to acquiring rights and interests in the East China Sea and Spratley Islands. How the rise of China, which is rapidly modernizing its military capabilities, will affect the security environment of Northeast Asia and beyond is still unclear, but many cannot feel optimistic about its future direction.

There exist some flash points between China and the US. In the short term, there is the problem of the Taiwan Strait, and in the medium to long term there are problems pertaining to their respective positions in the Asia-Pacific region and beyond. In addition, weapons of mass destruction (WMD) and missiles to deliver them are closely related to regional security trends. Given the complexity of relationships among the countries in the region, the security situation surrounding Japan can hardly be described as stable.

The 9/11 terrorist attacks had significant implications for the security environment of Northeast Asia. Forced to recognize the vulnerability of its own homeland, the US has clearly adopted a security policy that emphasizes protection of national interests backed by its overwhelming advantage in military power. The so-called "Bush Doctrine" symbolizes such a policy. In September 2002, the US released a National Security Strategy (NSS) that listed homeland

security, the proliferation of WMD, and terrorism as the issues of highest priority, and declared that the US would not hesitate to take preemptive actions against such threats, unilaterally if necessary.[1] The new NSS in September 2006 also stated that, while seeking "to address proliferation concerns through international diplomacy," "[i]f necessary, …under long-standing principles of self defense, we do not rule out the use of force before attacks occur, even if uncertainty remains as to the time and place of enemy's attack," reiterating that it would still maintain the option of preemptive actions.[2]

Since the 9/11 terrorist attacks, the US has accelerated the shift of its security focus from Europe to the Middle East and Asia. Although the terrorist attacks hit the US homeland, the "wars on terrorism" are being fought in Afghanistan and Iraq. In the Quadrennial Defense Review (QDR) of 2001, the US indicated concern over the rise of China, saying that "[t]he possibility exists that a military competitor with a formidable resource base will emerge" in Asia and that "[t]he East Asian littoral—from the Bay of Bengal to the Sea of Japan—represents a particularly challenging area."[3] The US also defined the region from the Middle East through the Malacca Strait to East Asia as "an arc of instability" and argued for a stronger presence of US forces in this region as part of a US global strategy.

In its QDR of 2006, the US pointed to China as one of the countries at the "strategic crossroads," stating that "[t]he pace and scope of China's military build-up already puts regional military balances at risk,"[4] and announced the US "Navy plans to adjust its force posture and basing to provide at least six operationally available and sustainable carriers and 60% of its submarines in the Pacific to support engagement, presence and deterrence."[5] The US expects Japan to act as a base for US security policies toward Asia, as well as a platform for US deployments to "the arc of instability," including the Middle East.

Northeast Asian countries have either cooperated with the new US policies or resisted them. North Korea admitted its possession of nuclear weapons in October 2002. Since then, it has argued that the US intends to suppress North Korea and adhered to a policy of possessing nuclear "deterrence power." China, seeking multipolarism to check growing US unilateralism since the 9/11 terrorist attacks, has solidified the Shanghai Cooperation Organization (SCO) established

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[1] See United States of America, *The National Security Strategy of the United States of America*, September 2002
[2] *Ibid.*, p. 23.
[3] Department of Defense, *Quadrennial Defense Review Report*, September 30, 2001, p. 4.
[4] Department of Defense, *Quadrennial Defense Review*, February 6, 2006, p. 29.
[5] *Ibid*, p. 47.

under China's initiative with Russia and Central Asian countries, while reinforcing its relationships with countries in Africa, the Middle East, Southwest and Southeast Asia, the South Pacific, and Latin America.

Japan and South Korea, two key US allies in the region, have taken strongly contrasting paths. The Japan-US alliance was gradually strengthened through the announcement of the "Japan-US Joint Declaration on Security" in 1996 and the establishment of the "Guidelines for Japan-US Defense Cooperation" in 1997. The alliance relationship has grown closer since the 9/11 terrorist attacks. Faced with a deteriorating security environment in Northeast Asia, Japan and the US recognized that the strengthening of their alliance would play an important role not only in the defense of Japan, but also in regional security. Under such recognition, both countries have discussed means of improving alliance capabilities to respond to new types of threats and various situations through the Japan-US Security Consultative Committee (SCC, or "2+2") and other channels.

On the other hand, the US-South Korea alliance has seemed to cool since the inauguration of the Roh Moo-hyun administration, which has asserted the vision of South Korea as a "balancer" in Northeast Asia between "Japan / US" and "China / Russia," and pushed for "autonomous defense." South Korea's conciliatory attitude toward North Korea, antipathy among the South Korean people to US forces in their country, and the restructuring of US forces in South Korea as part of a general realignment of US force structure, all contributed to the cooling of this relationship.

The US is not the only factor that influences the security environment in Northeast Asia. Japan and North Korea intermittently hold dialogues on normalizing diplomatic relations but the abduction issue and spy ship incidents have prevented the development of their relationship. In an emergency on the Korean Peninsula, Japan, as an ally of the US, would immediately face a serious WMD threat from North Korea. Japan-China relations can be called "politically chilly and economically warm," due to competition for leadership in East Asia, the issue of marine resource exploration, and problems of past history. In such a situation, the rise of narrow-minded nationalism in Northeast Asia is likely to become a factor in rising tensions over political and security issues.

Northeast Asian countries were divided in their response to North Korea's ballistic missile launches in July 2006. While Japan and the US saw North Korea's launches as a serious threat to regional and international security, and attempted to gain a UN Security Council resolution stipulating sanctions against North Korea under UN Charter Article 7, China and Russia merely

expressed their "strong regret" and opposed the adoption of a resolution involving sanctions. These two neighbors of North Korea feared that pushing North Korea too hard might impact both of them. In addition, they might have been motivated by their goal of offsetting the unilateral structure led by the US. South Korea expressed "strong regret" during a South-North Ministerial Meeting held immediately after the North's missile launches and decided to stop deliveries of rice and fertilizer to North Korea. Still, South Korea opposed the adoption of UN sanctions, and especially criticized Japan's strong response. Japan and the US on one side and China and Russia on the other at last compromised to adopt the UN Security Council resolution. However, these developments strongly suggest a polarization of Northeast Asia between Japan-US and China-Russia on security issues, with the current South Korean administration, given its strong anti-Japan sentiment, tending to incline toward China.

Northeast Asia cannot ignore global security issues, especially moves by non-state actors such as international terrorist groups. International terrorist networks extend to Asia, mainly Southeast Asia. Japan, which has further strengthened its relationship with the US since the 9/11 terrorist attacks, dispatched its Self-Defense Forces to Iraq, and actively participated in the MIO (Maritime Interception Operation) near the Arabian Peninsula, may become their target.

Traditional power politics are likely to continue in Northeast Asia for the time being, and regional countries will place higher priority on security issues. Certainly these countries value economic development as well, and it is difficult to predict whether cooperation on economic issues will contribute to further stability or promote instability in this region. The security environment of Northeast Asia is leaning toward further complexity, so the factors to which Japan must pay attention are increasingly diversified and indeed some already constitute threats.

2. Issues of WMD and Missiles in Northeast Asia

The Northeast Asian security environment is increasingly complicated by the fact that regional security is closely tied to WMD and missiles.

Three major nuclear-weapon states, the US, Russia and China, have been involved deeply in Northeast Asian security issues. Russia's nuclear forces have been shrinking because of financial difficulties, but it is still a "nuclear superpower" and promotes the development and deployment of new strategic nuclear weapons. Although the US repeatedly states that no hostile relationship exists between it and Russia, there is no doubt that the US continues to maintain strategic nuclear posture readiness with Russian strategic nuclear power in mind.

Concerning US-China relations, the Nuclear Posture Review submitted to Congress by the Bush Administration in 2001 included China as one country that could be involved in immediate or potential contingencies. China's efforts to modernize its nuclear forces are being undertaken on the assumption of a potential confrontation with the US.

On the other hand, China-Russia relations are becoming closer due to their common interest in offsetting the dominance of US power. China is one of Russia's largest customers for arms exports, including high-performance fighter jets and submarines. Because of potential concerns over China, the weapons that Russia provides are not necessarily the most advanced. The Soviet Union stopped cooperation in nuclear weapons and missiles with China from the Sino-Soviet confrontation in the late 1950s. If the China-Russia relationship remains favorable, then we cannot eliminate the possibility of Russia providing its most advanced weapons to China as well as extending technological cooperation in nuclear weapons and missiles.

Non-nuclear-weapon states cannot remain bystanders on issues on WMD and missiles. North Korea declared its withdrawal from the Nuclear Non-Proliferation Treaty (NPT) in January 2003, and has frequently stated its retention of "nuclear deterrence capabilities." North Korea is widely deemed to possess biological and chemical weapons. Moreover, despite a commitment to continue a moratorium on missile launching under the Pyongyang Declaration between Japan and North Korea, North Korea has continued to develop, deploy and increase its ballistic missile capabilities – as underlined by their missile launches in July 2006.

South Korea and Taiwan do not possess WMD or mid- to long-range ballistic missiles. Yet, South Korea has short-range ground-to-ground ballistic missiles, and Taiwan possesses land-attack cruise missiles and the potential capability to manufacture ballistic missiles. Both countries seriously considered development of nuclear weapons during the Cold War, but abandoned such plans due to pressure from the US. In addition, there exists the possibility of non-state actors, including international terrorist groups, possessing WMD and missiles, even if limited in numbers and capabilities, and using them in the Northeast Asian region.

This section will focus on the situation of North Korea, China, and Russia in terms of WMDs and missiles that may pose threats to Japan. It must be noted that these three countries are considered as major exporters of WMD and missiles, as well as related materials, equipment and

technologies.[6]

1) North Korea

Since the end of the Cold War, the North Korean nuclear issue has been considered one of the most important issues that the international community needs to address. Long suspected of nuclear weapons development, North Korea rejected special inspections by the International Atomic Energy Agency (IAEA) in 1993, and announced its intent to withdraw from the NPT. However, through negotiation with the US, North Korea "suspended" its withdrawal from the NPT, and signed the Agreed Framework with the US in 1994. The Agreed Framework stipulated that, in return for the freezing of North Korean nuclear-related activities and the dismantling of its 5 MW graphite-moderator reactor, the US would support the construction of light water reactor power plants in North Korea, and provide 500,000 tons of heavy oil annually as alternative energy until its completion. Through a series of processes, the Agreed Framework aimed first to freeze North Korea's capability to develop nuclear weapons, and then to have North Korea entirely abandon its nuclear weapons program.

However, when the US presented evidence of secret North Korean uranium enrichment activities in October 2002, North Korea allegedly admitted it[7] and argued that it would continue nuclear weapons development in violation of the Agreed Framework. Later, North Korea admitted its retention of "nuclear deterrence capabilities" and in January 2003, declared "an automatic and immediate effectuation of its withdrawal from the NPT." North Korea resumed the operation of its 5 MW graphite moderator reactor and reprocessing facility frozen by the Agreed Framework, and has likely produced weapons-grade plutonium. Since 2003, the Six-Party Talks among Japan, the US, South Korea, North Korea, Russia and China have been held to resolve the North Korean nuclear issue peacefully, but so far without conclusion.

North Korea is thought to already possess two or three nuclear weapons. Some US researchers estimated that North Korea has weapons-grade plutonium sufficient to make 6 to 8 weapons, and could produce plutonium sufficient to manufacture one nuclear weapon per year. If construction of a 50 MW nuclear reactor is completed, then plutonium production capacity would increase to 10

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[6] The "Unclassified Report to Congress on the Acquisition of Technology Relating to Weapons of Mass Destruction and Advanced Conventional Munitions" published by the US' Director of Central Intelligence biannually also named these three countries as major suppliers and has constantly reported on their activities.

[7] North Korea obtained 150 tons of high-strength aluminum tubes, which are equivalent to 2600 centrifuges for uranium enrichment, from a Russian company, and were said to have ordered 200 tons more from a German company. See *Asahi Shimbun*, June 5, 2005.

nuclear weapons per year.[8] Since the Agreed Framework did not aim to freeze the development of detonators, the pursuit of miniaturization, and the development of delivery vehicles, North Korea has continued such activities. It is concerned that North Korea may acquire technologies to equip ballistic missile warheads with nuclear weapons.[9]

It is also widely known that North Korea possesses biological and chemical weapons, although the details are unclear. According to the 2005 National Defense White Paper of South Korea, North Korea is estimated to have about 2,500 to 5,000 tons of toxic chemicals, including nerve, blister and choking agents that are manufactured by several chemical plants and stored in various facilities throughout the country, as well as the capability to manufacture such biological weapons as anthrax, polio and cholera bacteria.[10]

North Korea has also sought ballistic missiles that can carry such weapons. They have already deployed several hundred SRBM Scud missiles able to reach all of South Korea. Among the ballistic missiles North Korea launched in July 2006 appear to be Scud Ds with a 700 km range and Scud ERs with a range of 1,000 km, both confirming that North Korea has continued efforts to improve Scuds. As Scud ERs can reach the western half of Japan, they are another new concern for the region.

The MRBM No Dong poses a direct threat to Japan. The No Dong is a mobile, liquid-fueled, single-stage ballistic missile North Korea developed from the Scud. The No Dong was test-launched into the Sea of Japan in 1993, and several more No-dongs were fired in July 2006. The No Dong's range of 1,300 km covers the whole of Japan, and the missile can reach Japan within 10 minutes of launch. It is estimated to have a payload of 700 to 1,200 kg, and a Circular Error of Probability (CEP) of 2.5 km. This means that the No Dong can be armed with nuclear as well as biological and chemical warheads. At present, North Korea is believed to have about 200 No Dong missiles deployed.[11]

The No Dong can be fired from a Transpotable Erectable Launcher (TEL), so it is difficult to

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[8] See presentation by Professor Hecker of Stamford University at the symposium hosted by Carnegie Endowment [http://www.carnegieendowment.org/static/npp/2005conference/presentations/hecker.pdf].

[9] See Narushige Michishita, "The Weapons of Mass Destruction and Missiles of North Korea", Center for the Promotion of Disarmament and Nonproliferation, Japan Institute of International Affairs (ed.), *Issues of Non-Proliferation of Weapons of Mass Destruction*, Report of the research project commissioned by Ministry of Foreign Affairs, March 2004, pp. 84-85 (in Japanese).

[10] The analysis presented in the National Defense White Paper of South Korea (February 2005) was quoted in the Japan Defense Agency's *Defense of Japan 2005 White Paper*.

[11] B. B. Bell, Commander, United Nations Command; Commander, Republic of Korea-United States Combined Forces Command; and Commander, United States Forces Korea, "Statement," Before the Senate Armed Services Committee, 7 March 2006.

ascertain its location.[12] A No Dong with a WMD warhead would likely cause significant damage to Japan. Therefore, North Korea may consider the No Dong an effective tool of political and military intimidation to seek Japanese concessions on political issues, or for use in an emergency on the Korean Peninsula. North Korea may try to instigate anti-US feeling among the Japanese by inflicting damage in the neighborhood of US bases in Japan.[13] In addition, the No Dong is a valuable tool for North Korea to earn foreign currency. Ballistic missiles such as Pakistan's Ghauri and Iran's Shehab-3 are said to be No Dong missiles or based on the No Dong design.[14]

The Taepo Dong, which overflew Japan in 1998, is a two-stage IRBM. The test launch reportedly verified technologies for the separation of multi-stage propellants, as well as positioning and thrust control.[15] North Korea continues to develop the Taepo Dong 2 (3,500 to 6,000 km range, with a new booster for the first stage, and a No Dong for the second stage), and Taepo Dong X (with a range over 12,000 km?) that can reach the US mainland. North Korea launched the Taepo Dong 2 in July 2006, but evidently it failed. It is quite likely that North Korea is seeking another launch opportunity. For Taepo Dong X, North Korea has reportedly acquired Russian SS-N-6 technology, which would enable it to arm these missiles with rudimentary and heavy nuclear warheads.[16]

According to the US National Intelligence Estimate (NIE), it is most likely that the US will face an ICBM threat from North Korea by 2015.[17] If North Korea deploys an ICBM that can reach the US, intimidation calling into question the US willingness to sacrifice the continental US to protect Tokyo and Seoul becomes possible, so there is some concern over a possible effect on the US commitment to defend Japan and South Korea.

North Korea declared a moratorium on the launching of long-range missiles in 1999, and the Pyongyang Declaration between Japan and North Korea announced in September 2002 stated an intention to extend the moratorium on missile launching beyond 2003. However, North Korea

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[12] Regarding the No Dong, see Michishita, "The Weapons of Mass Destruction and Missiles of North Korea," pp. 93-96.
[13] Narushige Michishita, "The No Dong Threat and Missile Defense: Seeking New Strategies," *Sekai Shuho*, August 17-24, 2004, p. 15 (in Japanese) .
[14] About the significance of the No Dong for North Korea, see Michishita, "The Weapons of Mass Destruction and Missiles of North Korea," pp. 96-100.
[15] *Defense of Japan 2005 White Paper*, p. 44.
[16] Andrew Feickert, "Missile Survey: Ballistic and Cruise Missiles of Selected Foreign Countries," *CRS Report for Congress*, RL30427 (Updated July 26, 2005), p. 14.
[17] National Intelligence Council, "Foreign Missile Development and the Ballistic Missile Threat Through 2015," Unclassified Summary of a National Intelligence Estimate (NIE), December 2001 [http://www.cia.gov/nic/pubs/other_products/Unclassifiedballisticmissilefinal.htm].

reportedly conveyed to Japan its intent not to continue this moratorium in February 2006.[18] At the time of the July 2006 missile launches, a spokesman for the North Korean Foreign Ministry described them as part of routine military exercises. The spokesman argued that the North's "exercise of its legitimate right as a sovereign state is neither bound to any international law nor to bilateral or multilateral agreements such as the DPRK-Japan Pyongyang Declaration and the joint statement of the six-party talks." And "the moratorium on long-range missile test-fire which the DPRK agreed with the US in 1999…was valid only when the DPRK-US dialogue was underway." In relation to the Pyongyang Declaration, Song Il Ho, the ambassador in charge of diplomatic normalization between Japan and North Korea, said that since North Korea had committed in the Declaration to the continuation of the moratorium on missile launches beyond 2003 on the presumption that both countries would maintain a spirit of confidence building toward a normalization of diplomatic relations, the conduct of military exercises in a situation with no such dialogue was not in violation of the Declaration.

Recently, it was revealed that Kh-55 air-launched cruise missiles made in the former Soviet Union and left in Ukraine had been illegally exported to Iran (12 missiles) and China (6 missiles), and there has been growing concern that such illegal trade might include North Korea.[19] Certainly, it would not result in a significant threat to Japan or the US even if North Korea did obtain Kh-55 since there would be technological problems in miniaturizing nuclear warheads to fit the Kh-55, and it would also be difficult to modify these missiles for ground launch.[20] Still, the possibility of illegal transfers related to WMD or missiles from the former republics of the Soviet Union, including Ukraine, cannot be eliminated.

On the other hand, North Korea has exported ballistic missiles to Egypt, Iraq, Syria, Libya, Pakistan, Yemen, and the United Arab Emirates (UAE) for a long time as a way of earning foreign currency. In 2006 concern was raised over Venezuela seeking to import ballistic missiles from North Korea. Moreover, North Korea was suspected of involvement in the nuclear black market centered on Abdul Qadeer Khan of Pakistan.[21]

Cooperation among states of proliferation concern may drastically reduce the time and cost to

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[18] *Sankei Shimbun*, February 11, 2006.
[19] Feickert, "Missile Survey," p. 9.
[20] Kensuke Ebata, "Effects of Cruise Missiles Leaked from Ukraine", *Sekai Shuho*, May 10-17, 2005, pp. 52-53 (in Japanese) .
[21] For cooperation on proliferation among these countries, see Chaim Braun and Christopher F. Chyba, "Proliferation Rings: New Challenges to the Nuclear Nonproliferation Regime," *International Security*, Vol. 29, No. 2 (Fall 2004), pp. 9-26; Sharon A. Squassoni, "Weapons of Mass Destruction: Trade between North Korea and Pakistan," *CRS Report for Congress*, RL31900 (May 7, 2003); Leonard S. Spector, "The Rise of a New Axis?" *Yale Global*, 11 February 2005 [http://yaleglobal.yale.edu/article.print?id=5265].

acquire nuclear weapons, resulting in a serious challenge to non-proliferation efforts. For example, there is the possibility that North Korea exported ballistic missiles to Pakistan in return for uranium enrichment and other nuclear weapon-related technologies.[22] Moreover, North Korea was suspected of exporting No Dong parts and technologies to Iran, and reportedly exported uranium hexafluoride to Iran in May 2004.[23] In addition, North Korea most likely provided two tons of uranium hexafluoride to Libya.[24] Although the US so far has not found solid evidence that North Korea supplied fissile materials to international terrorist groups, there is no assurance that they will not do so in the future,[25] per the US view that it is not clear under what situation North Korea would sell nuclear weapons or technologies to other countries or non-state actors.[26]

2) China

China is the only country among the five nuclear-weapon states that has not started to reduce its nuclear weapons, and continues efforts to modernize nuclear capabilities with emphasis on the build-up of ground based ballistic missiles.

China's modernization efforts have already succeeded in the development of SRBMs and MRBMs. Their SRBMs are solid-fuel mobile-launched DF-11s (with a 300 km range) and DF-15s (with a 600-km range), deployed since 1995. Most of these missiles are armed with conventional warheads and deployed facing the Taiwan Strait. The number deployed to this area is about 710 to 790, and is estimated to increase by 100 missiles per year.[27] These missiles have relatively good precision with a CEP of 200 to 300 meters, and can pose a significant threat not only to Taiwan, but also to US naval forces deployed in Northeast Asia. Moreover, some of these SRBMs are within range of Okinawa and the Nansei Islands of Japan.

For MRBMs, China has deployed 50 of the solid-fuel, mobile DF-21 (1800-km range), since 1991. The DF-21 can be armed with nuclear weapons and has relatively good precision (its CEP is 300 to

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[22] See Gaurav Kampani, "Second Tier Proliferation: The Case of Pakistan and North Korea," *The Nonproliferation Review*, Fall-Winter 2002, pp. 107-116; Sharon A. Squassoni, "Weapons of Mass Destruction: Trade between North Korea and Pakistan," *Report for Congress*, RL31900 (May 7, 2003).
[23] *Sankei Shimbun*, November 7, 2004. Regarding the cooperation between North Korea and Iran on nuclear and missile development, see also Mark Fitzpatrick, "Iran and North Korea: The Proliferation Nexus," *Survival*, Vol. 48, No. 1 (Spring 2006), pp. 62-68.
[24] David E. Sanger and William J. Broad, "Tests Said to Tie Deal on Uranium to North Korea," *The New York Times*, February 2, 2005 [http://www.nytimes.com/2005/02/02/politics/02nukes.html?hp&ex=1107406800&en=decef909e93c12b8&ei=5094&partner=homepage].
[25] Lowell E. Jacoby, Director, Defense Intelligence Agency, "Current and Projected National Security Threats to the United States," Statement for the Record, Senate Select Committee on Intelligence, 16 February 2005.
[26] Thomas Fingar, Assistant Secretary of State for Intelligence and Research, "Security Threats to the United States," Statement for the Record, Senate Select Committee on Intelligence, February16, 2005.
[27] Office of the Secretary of Defense, *Military Power of the People's Republic of China 2006*, A Report to Congress Pursuant to the National Defense Authorization Act Fiscal Year 2000, May 2006, p. 29.

400 meters), so it is thought to have the role of attacking US bases and so on in Japan. Including the modified DF-21A, China possesses over 100 MRBMs.

As for ICBMs that can attack the continental US, China presently possesses about 20 liquid-fuel, fixed-launch DF-5 missiles (with a 13,000-km range). As China continues efforts to modernize and develop ICBMs, it is expected that solid-fuel mobile launching type DF-31 (with an 8000-km range) are likely to be deployed soon. The DF-31 is reportedly Multiple Independently Targetable Reentry Vehicle (MIRV) capable, and could be converted to a JL-2 SLBM.

In addition, China is developing a DF-31A missile with a 12,000-km range. According to the US NIE, China is expected to deploy 75 to 100 nuclear warheads on ICBMs or SLBMs by 2015.[28] China is developing the Type 094 nuclear-powered ballistic missile submarine (SSBN) that can carry the JL-2 missile. This SSBN is expected to enter service by 2010. Once these SSBNs are deployed, the survivability of China's strategic nuclear forces and its US homeland attack capability will be greatly increased. To counter the BMD systems the US and other countries are promoting, China appears to be developing multiple warheads, jamming (electronic disturbance) against interceptor sensors, and decoys.

China is also proceeding with the development and deployment of land attack cruise missiles (LACM). The US Defense Intelligence Agency (DIA) estimates that China will possess several hundred high-precision LACMs that can be launched from air or ground by 2015.[29] Moreover, China is modernizing their anti-ship cruise missile (ASCM) capabilities by introducing the SS-N-22 and SS-N-27 from Russia. Further, China is participating in the Galileo Satellite Navigation System of the European Union (EU), causing concern that they may use the technologies to improve precision-guidance bombs as well as ballistic and cruise missiles.[30]

For many years China has supplied equipment, materials, and technologies related to WMD and missiles to North Korea, Pakistan, Iran, Libya and others.[31] The blueprints for nuclear warheads found in Libya had some Chinese-language markings, so some believe that China might have been involved with nuclear weapons development in Pakistan, as those given to Pakistan would have

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[28] National Intelligence Council, *Foreign Missile Development and the Ballistic Missile Threat through 2015*, Unclassified Summary of a National Intelligence Estimate, December 2001, p. 8.
[29] Lowell E. Jacoby, Director, Defense Intelligence Agency, "Current and Projected National Security Threats to the United States," Statement for the Record, Senate Select Committee on Intelligence, 16 February 2005.
[30] Feickert, "Missile Survey," p. 12.
[31] On China's cooperation in the proliferation of the weapons of mass destruction and missiles, see Shirley A. Kan, "China and Proliferation of Weapons of Mass Destruction and Missiles: Policy Issues," *CRS Report for Congress*, RL31555 (updated January 31, 2006).

been sent to Libya through the nuclear black market. Although China has been strengthening its own export control system in recent years, illegal exports of related materials, equipment, and technologies by Chinese companies seems to be continuing.

While China is not a member of the Missile Technology Control Regime (MTCR), it has committed to implement export control in accordance with the MTCR guidelines. Several Chinese companies, however, have been involved in ballistic missile-related projects in Pakistan and Iran, and are suspected of supplying dual-use items applicable to missile development to North Korea and other countries. In January 2005, the US imposed sanctions against eight Chinese companies that have aided Iran's ballistic missile program.[32]

Recently, it has been pointed out that China may be developing Theater Ballistic MSissiles (TBM) that can be equipped with Maneuverable Reentry Vehicles (MaRV). These TBMs, combined with a broad-ranged maritime surveillance targeting system, can attack large vessels such as US aircraft carriers. China's MaRVs are expected to reach ship attack capability by 2015. China seems to be thinking of operating these missiles by synchronizing them with a broad-ranged intelligence gathering system consisting of over-the-horizon (OTH) radars (of which China is already reported to have three), surveillance satellites, and airborne early warning (AEW) aircraft or unmanned aerial vehicles (UAV). If the target is a vessel moving at very high speed, then high-powered microwave devices (HPMD) under development could be used for warheads.[33] In addition, HPMD could cause serious damage to urban targets.

3) Russia

Although its strategic nuclear weapons are diminishing due to financial difficulties since the collapse of the Soviet Union, Russia still possesses a massive strategic nuclear force second only to that of the US. The core of Russia's strategic nuclear forces is its ICBMs. When the US withdrew from the ABM Treaty, Russia declared that it would not be bound by the Strategic Arms Reduction Treaty II (START II) and could retain its ICBMs with MIRVs such as SS-18. As of 2006, Russia deploys 2270 nuclear warheads loaded on these ICBMs.

A new type of ICBM, the SS-27, is said to have MaRVs. In addition, Russia is developing the

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[32] For example, see Director of Central Intelligence, "Unclassified Report to Congress on the Acquisition of Technology Relating to Weapons of Mass Destruction and Advanced Conventional Munitions, 1 July Through 31 December 2003"; David E. Sanger, "U.S. Punishes 8 Chinese Firms for Aiding Iran," *New York Times*, January 18, 2005 etc.

[33] See Ronald O'Rourke, "China Naval Modernization: Implications for U.S. Navy Capabilities—Background and Issues for Congress," *CRS Report for Congress*, RL33153 (November 18, 2005).

SS-N-30 as a SLBM to be loaded on new SSBNs entering service in 2006. The SS-N-30 is also thought to have MaRVs and to have a relatively short combustion time to counter boost-phase BMD. The number of current strategic nuclear warheads deployed, including those on heavy bombers, is estimated to be 3814.

Russia does not possess land-based ballistic or cruise missiles with ranges of 500 to 5,500 km due to the INF (Intermediate-Range Nuclear Forces) Treaty it concluded with the US. Its SS-26 SRBM (with a range of 400 km for Russian versions, and 200 km for the export type) can counter missile defense systems through its boost and terminal phase maneuverability, its depressed trajectory, and its low radar signature.[34] Moreover, Russia possesses various types of anti-ship cruise missiles as well as some land-attack cruise missiles.

For non-strategic duties, Russia relies heavily on bombers armed with nuclear weapons. Among them, it is believed that the Far East Regional Russian Forces possess medium-range bombers like the Tu-22M Backfire, and sea and air launched cruise missiles."[35]

In the near future, Russia is not likely to confront the US and the NATO militarily nor will Russian nuclear forces pose a direct threat to Japan. On the other hand, Russia's control of nuclear weapons after the collapse of the Soviet Union is not necessarily adequate, leading to concern that its nuclear-armed ballistic missiles could be launched accidentally or without approval. Moreover, it has been pointed out that some Russian companies are supplying ballistic missile-related materials, equipment and technologies to Iran and China.[36]

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[34] Feickert, "Missile Survey," p. 8.
[35] See *Defense of Japan 2005 White Paper*, p.63.
[36] For example, see Director of Central Intelligence, "Unclassified Report to Congress on the Acquisition of Technology Relating to Weapons of Mass Destruction and Advanced Conventional Munitions, 1 July Through 31 December 2003."

Chapter 3 Comprehensive Measures against Missile Attacks

1. Comprehensive Measures to Respond against Ballistic Missile Attacks

1) Significance

Japan is within the range of Chinese and North Korean IRBMs and MRBMs as well as some SRBMs. In particular, the North Korean No Dong MRBM has WMD capability that poses an imminent threat under the Kim Jong Il's brinkmanship diplomacy. The threat from China is not imminent, yet its deployment of ballistic missiles with ranges that can cover Japan is undoubtedly a source of concern both in their quantity and quality. Furthermore, there are concerns on possible ballistic missile attacks by international terrorist groups and other non-state actors. Japan has not adopted effective response measures against such threats. Therefore, it is undoubtedly meaningful for Japan's national security to respond against ballistic missile attacks at the earliest time possible. The significance of such measures can be summarized in the following three points.

First, it will allow Japan to respond against ballistic missile attacks, which is totally lacking at present. At the time of North Korea's missile launches in July 2006, Japan was in mid-way in the development of a BMD system, thus it was able to track North Korea's ballistic missiles in cooperation with the US, indicating an ability to respond much more effectively than was the case during North Korea's launching of Taepo Dong 1 in 1998. Second, it will contribute to strengthening the Japan-US alliance by working together on promoting ballistic missile defense, and defending US Forces in Japan from the threat of ballistic missiles. Third, Japan can play a more important role in the international community by using a BMD capability for diplomatic leverage, and for taking initiatives within regional and international frameworks of arms control, disarmament and non-proliferation to prevent the international proliferation of ballistic missiles.

2) Comprehensive Measures

How should Japan acquire the means to respond to ballistic missile attacks? Considering response against ballistic missile attacks from more comprehensive point of view, there are measures to constrain and prevent ballistic missile attacks, to intercept launched missiles, and to minimize damage from missile hits. It is necessary to possess every required function including dissuasion as a preventive diplomatic measure, deterrence as a national posture, military action against the launching of ballistic missiles, neutralization of conventional or WMD warheads of launched missiles, and minimization of damage when hit. It will also necessary to maximize the synergy of all these functions.

It will be necessary to make appropriate efforts in "dissuasion diplomacy" to prevent the appearance of threats through non-military measures such as diplomatic activities and confidence building measures (CBMs). It is also necessary to maintain a "deterrence posture" against the use of ballistic missiles by raising doubts on the effectiveness of ballistic missile attacks. Dissuasion and deterrence are in sense soft and hard responses that complement each other to prevent the manifestation of threats. Moreover, military power for a "deterrence posture" can ensure the effects of dissuasion diplomacy.

We should consider how to respond when deterrence efforts fail. The immediate issue after the collapse of deterrence is to disable an enemy's offensive power. There are two military means to do this. One is "denial power" for "offensive defense" — that is, to attack ballistic missiles bases and to disable the missiles before launch. The other is "defense capability" for "active defense" — that is, to intercept incoming ballistic missiles. This is "ballistic missile defense" in a general sense.

Finally, it is necessary to confine damage in cases where interception fails. "Damage confinement" for "passive defense" involves citizens to minimize damage through deception of important targets, preparation of secure buildings for evacuation, rescues measures, etc.

In summary, comprehensive measures appropriate for Japan's response to ballistic missile attacks are (1) dissuasion diplomacy, (2) deterrence posture, (3) denial power (offensive defense), (4) defense capability (active defense), and (5) damage confinement (passive defense). These five measures can be termed the "5Ds." The synergistic effects of these 5Ds will be critical to Japan's response against ballistic missile attacks.

2. Five Measures to Respond against Ballistic Missile Attacks (5Ds)

1) Dissuasion Diplomacy

In response to ballistic missile attacks, dissuasion diplomacy is a means to prevent the manifestation of threats through diplomatic activities and CBMs. Dissuasion diplomacy includes efforts to prevent the proliferation of WMD and ballistic missiles, and related efforts in arms control and disarmament. International conventions related to the proliferation of WMD include the Nuclear Non-Proliferation Treaty (NPT), the Biological Weapons Convention (BWC), and the Chemical Weapons Convention (CWC). For the non-proliferation of ballistic missiles, there are the Missile Technology Control Regime (MTCR), and the Hague Code of Conduct against Ballistic Missile Proliferation (HCOC). Japan needs to reduce threats by participating in arms control, disarmament, and non proliferation measures to prevent WMD and ballistic missile proliferation,

as well as prevent the manifestation of threats through strengthening non-proliferation regimes and persuasion of non-participating countries to join the relevant treaties.

In this sense, it is worthy to note that Japan has been participating in the Proliferation Security Initiative (PSI) as a core member, and hosted a multilateral exercise called "Team Samurai 04" in October 2004. In addition, Japan took an initiative in response to North Korea's missile launches July 2006, and succeeded in winning the unanimous adoption of the UN Security Council Resolution 1695. This resolution not only condemned the actions of North Korea, but also mandated to prevent the trade of missiles or related items, materials, goods and technologies, and the transfer of any financial resources in relation to North Korea's development of missiles and WMD (although the resolution did not include sanctions).

Unfortunately, there is no arms control/non-proliferation framework for ballistic missiles and WMD in Northeast Asia, although several countries possess such weapons. Therefore, Japan must actively participate in building such a framework to discuss regional arms control, disarmament and non-proliferation, including the six-party talks on the North Korean nuclear issue. Japan must also take the initiative to develop CBMs with neighboring countries, attempt to promote mutual understanding, ensure transparency, and thus develop a confidence-building regime in Northeast Asia that can become a regional arms control, disarmament and non-proliferation regime. At the same time, sufficient capabilities for both offensive defense and active defense will be essential for Japanese deterrence power that can support such dissuasion diplomacy. [See details in the Chapter 8 of Part 3.]

2) Deterrence Posture

Considering the security environment surrounding Japan, the soft and non-military measures of dissuasion diplomacy alone will not make arms control, disarmament and non-proliferation of WMD and ballistic missiles to effective. In the real world of international politics, what brings practical effect to dissuasion diplomacy is a hard and reliable response, which will make hostile entities doubt the effect of WMD attacks and restrain the use of such weapons. In other words, it is essential for Japan to retain military response capabilities.

To deter ballistic missile attacks, it is necessary to make opponent's decision-makers realize that such attacks will not have their expected effects, or will invite massive retaliation. For the deterrence to function properly there must be sufficient capability for retaliation, offensive defense or active defense, as well as will of their use. Offensive nuclear weapons have been considered the most effective weapons for deterrence. While the Japanese Government has stated that

possession of a minimum level of nuclear weapons for self-defense is not prohibited under Japan's Constitution,[1] Japanese policy is not to possess nuclear weapons in consideration of popular sentiment of being atomic-bomb victims, and a desire not to become a military power, as well as the potential for destabilizing the region. Instead, it has relied on the extended deterrence provided by the US, known as the "nuclear umbrella."

Under the "exclusively defensive-oriented policy," Japan used to have only armaments of active defense, but not offensive defense that could strike at enemy bases. If offensive defense measures were required, US Forces were expected to take this role. As described in the "Japan-US Alliance: Transformation and Realignment for the Future," adopted at the Japan-US Security Consultative Committee (SCC or "2+2") in October 2005, "U.S. strike capabilities and the nuclear deterrence provided by the U.S. remain an essential complement to Japan's defense capabilities in ensuring the defense of Japan and contribute to peace and security in the region." It is a realistic national security policy for Japan to continue relying on US deterrence power, and further promote a close allied relationship with the US.

However, threats in the 21st Century may arise suddenly and unexpectedly. Under such an environment, Japan needs to build new deterrence strategy. The US Navy aircraft carrier task group, which embodies effective offensive defense functions in Northeast Asia, may be absent (even if temporarily) from the region as seen in the case of Iraqi War, while Japan now faces ballistic missile threats from North Korea and other countries. It is time for Japan to seriously consider the strengthening of its deterrence posture against ballistic missile attacks by possessing offensive defense capability such as precision-guided munitions that can attack missile launch bases, in addition to the introduction of a ballistic missile defense system.

As symbolized by the 9/11 terrorist attacks, the characters of threats have been changing. As has the development of the Revolution in Military Affairs (RMA) and further technological advancements in the effectiveness of precision-guided weapon, the US is attempting to shift its deterrence posture from solely relying on deterrence by punishment to both deterrence by punishment and denial. Especially noteworthy is that the US tends to rely heavily on conventional precision-guided weapons. This suggests that the weapon system that Japan should possess for counter-force may also be those conventional precision-guided one. [See details in the Chapter 9 of Part 3.]

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[1] Reply of Reijirou Tsunoda, then the Director-General of Cabinet Legislation Bureau at the Budget Committee of House of Councilors during the 96th Diet (April 5, 1982).

3) Denial Power (Offensive Defense)

Denial power is an offensive defense capability to preempt missile launchers and related C4I installations, as well as ballistic missile-armed submarines and surface vessels (all referred to as "ballistic missile bases" hereinafter) using missiles, aircraft, surface vessels, and other armaments. This denial power is undoubtedly an effective means to deter ballistic missile attacks. In regards to attacks on ballistic missile bases, the Japanese Government interprets its Constitution to say that attacks on missile bases would be within the scope of national defense and allowable if no other methods are available to defend against attacks by guided missiles.[2] However, Japan has entirely relied on the US for such capability, judging that to retain offensive defense means by itself might not be beneficial in terms of effect on neighboring countries.

Yet, the security environment surrounding Japan today is under constant threat from ballistic missiles of North Korea, which has admitted continuing its nuclear weapons development. The risk of missile launches against Japan may rise depending on tension in the situation of Korean Peninsula. Only when "offensive defense" attacks on missile bases and "active defense" missile intercept capabilities are combined, Japan can have an effective defense against ballistic missile attacks. In the wake of North Korea's missile launches July 2006, arguments in Japan for having offensive defense capabilities to preempt ballistic missiles launches have become more evident.

Still, considering the current political situation in Japan, even if possession of offensive defense capabilities are permitted domestically, the actual use of such capability remains problematic. Even when the risk of ballistic missile attack becomes extremely high and political leaders are urged to launch preemptive attacks, hesitation could result in missing the opportunity for an appropriate response. Moreover, because it is difficult to detect signs of missile launching in cases of mobile launchers or ballistic missile-armed submarines, the possibility of a sudden first strike cannot be eliminated.

Thus, Japan needs to possess both the BMD system that can intercept the opponent's first strike by ballistic missile, and the offensive defense capability to minimize damage by preventing follow-on attacks.

The capability and the will to carry out attacks against ballistic missile bases will constitute an effective deterrence posture. It will also be important to review Japan's security environment

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[2] The answer of then the Prime Minister Ichiro Hatoyama (read by then the Director-General of Defense Agency, Naka Funada) at the Cabinet Committee of the House of Representatives during the 24th Diet (February 29, 1956).

regularly and build consensus among government officials on the required conditions for invoking the right of preemptive attack on ballistic missile bases.

Under the Japan-US Security Arrangement, US forces have taken the role of offensive defense. Under the current "Guidelines for Japan-US defense cooperation" as well, Japan is to closely cooperate and coordinate its Self-Defense Forces with US forces for ballistic missile defense and US forces are to use offensive power, if needed. While US forces are to carry out offensive defense operations against hostile missile bases, Japan is to provide operational and logistic support to US forces and protect US bases in Japan, thereby maintaining the mutuality of the alliance.

However, if the US is conducting military operation in other regions, and has difficulty in concentrating sufficient offensive forces to conduct offensive defense operations near Japan, Japan will have to assume some of the US role. Japan needs to bear in mind that it may be required to eliminate immediate threats by itself. It is imperative for Japan to closely consult with the US on role sharing in such situations. Japan must be ready to invest considerable resources to establish offensive defense measures, and at the same time thoroughly explain its intention to both its public and the international community. [See details in the Chapter 10 of Part 3.]

4) Defense Capability (Active Defense)

In considering BMD as an "active defense" measure, Japan's geographic position makes it necessary to build a multi-layered defense system that can allow defense in-depth utilizing ground, sea, air, and space systems. Based on both US and Japanese tests, the Japanese Government has determined that a BMD system has high technological feasibility. It also concluded that BMD is appropriate for Japan's national defense policies, and decided to approve development of a ballistic missile defense system at the Security Council of Japan and subsequent Cabinet meetings in December 2003, and introduce the Aegis BMD system of Sea-Based Midcourse Defense (SMD) as an upper-tier capability, and Patriot PAC-3 for lower-tier Ground-Based Terminal Defense (GTD). [From here on we will refer to the Ballistic Missile Defense system for Japan as the "BMD System."]

These two systems are part of Japan's Initial Defense Capability (IDC) for BMD. Japan is to have four Aegis ships with BMD capability as well as 18 PAC-3 units in service starting from early 2007. At the same time, the Japan Air Defense Ground Environment (JADGE), command and control, battle management and communications (C2BMC) system, will be developed to integrate these capabilities. Following the North Korean missile launches in July, Japan decided to accelerate development of its BMD system. To enable effective interception in a briefest time

possible, defense related laws were revised to delegate significant authority to unit commanders. Moreover, the operational environment has been improved with the establishment of a Chief of Joint Staff (used to be a Chairman of Joint Staff Council) position that has strong authority with sole responsibility for operation of the Self-Defense Forces.

A future task is concrete discussion on information sharing and combined operations between the Self-Defense Forces and US forces, especially with US missile defense units such as early warning satellites, forward deployed Aegis ships, and X-Band radars. From 2006, Japan-US joint technical research becomes joint development to upgrade SM-3 interceptors in Aegis BMD ships. For the lower-tier GTD, Japan will need to select a successor to PAC-3. There has been the discussion of introducing THAAD, but it is still undecided. Other possibilities include the addition of BMD capability to the Type-03 "Chu-SAM" (mid-range ground to air guided missile) developed by Japan for the use by the Ground Self-Defense Force, or joint development work with the US. [See Chapters 4 to 7, Part 2.]

5) Damage Confinement (Passive Defense)

Among damage confinement related measures, Japan needs to improve civil defense as soon as possible. In Japan there are some civil organizations to support police and firefighters, but the concept of civil defense has hardly existed. So, it is necessary to build a civil defense system that can cope with ballistic missile launches. National and local governments, public entities and other organizations can develop passive defense measures. Individuals can also raise their national security awareness and participate in civil defense plans to the extent possible. Such actions will be extremely important in preparation for damage confinement and hence for comprehensive ballistic missile defense.

For the moment, there is an urgent need to develop communication and response measures using existing organizations and provisions related to Japan's Law Concerning the Measures for protection of the Civilian Population. For communication measures, it will be more realistic to integrate existing systems such as those at the Office of Prime Minister, various command and control systems of the Ministry of Defense and Self-Defense Forces, disaster prevention systems of local governments, police, firefighters and the Coast Guards, as well as the reporting systems of public broadcasting stations.

Various countries have established civil defense measures to minimize damage from nuclear, biological, and chemical weapon attacks. Some of these measures may be useful for Japan to, such as:

- Develop a warning system covering the entire country;
- Educate and provide necessary training to people on response measures to damage from ballistic missile or WMD attacks ;
- Establish civil defense units, organized volunteering or draft;
- Promote storage of essential commodities of life and medical supplies; and
- Promote national and local government efforts to build public evacuation facilities.

For example, learning from the 9/11 terrorist attacks, US President Bush established a "Freedom Corp," an advanced civil defense organization. It is also important to determine the role sharing of public sectors such as Self-Defense Forces and police on the one hand, and non-governmental organizations (NGOs) and individual volunteer activities on the other.

At present, Japan has almost no organized efforts for civil defense. To respond against ballistic missile attacks, Japan needs to establish some civil defense system as soon as possible. At the time of North Korea's launches of ballistic missiles in July 2006, there was a problem of delayed communication of information from the central government to local authorities. Concerning activities of Self-Defense Forces, it is necessary to develop concrete response plan for the confinement of damages through consultation led by the Ground Self-Defense Force, with other Self-Defense Forces, US Forces, relevant security organizations, relevant ministries and agencies as well as local governments. At the same time it is necessary to implement required training of citizens.

[See details in the Chapter 11 of Part 3]

3. Comprehensive Measures Against Land Attack Cruise Missiles

Unlike ballistic missiles, North Korea, China and other countries have not deployed land attack cruise missiles (LACM) able to cover Japan. However, considering the trends of North Korea and China, it may not be long before these two countries deploy LACMs of concern to Japan in terms of quality as well as quantity. There is also the concern that non-state actors including international terrorist groups may carry out attacks using LACMs. Japan does not have an effective response to such threats. Japan should as soon as possible begin to study LACM defense measures (for example, Japan-US joint technological research), and then to implement such measures as needed. As in the case of ballistic missile attacks, the significance of such actions can be summarized in the following three points.

First is to strengthen Japan's overall defense capability. Second is to enhance the extended deterrence provided by the US through capability to defend US forces in Japan from the LACMs as

well as ballistic missile threats, thereby strengthening the Japan-US alliance. Third, by adding response to LACM attack, it will allow Japan to use such capability together with BMD related measures to support greater initiatives in arms control, disarmament and nonproliferation efforts.

One of Japan's priority defense issues is the development of ballistic missile defense. Since Fiscal Year 2004, BMD system development has taken over 10% of yearly JDA equipment procurement budgets. To add significant funds for LACM defense will be extremely difficult as increases in defense budgets are not expected for some years to come. Therefore, it would be more realistic to prioritize ballistic missiles defense while extending BMD system design to some element of cruise missile defense, and plan a gradual development of overall air defense capabilities for the Air Self-Defense Force to incorporate defense against LACM.

In this case, it is necessary to obtain comprehensive capabilities including dissuasion diplomacy, deterrence posture, denial power, defense capability and damage confinement, as in the case of 5Ds for ballistic missile defense. [See details in the Chapter 13 of Part 3.]

Part 2 BMD Initiative as Active Defense Measures

Chapter 4 Japan's Ballistic Missile Defense

1. Japan's Ballistic Missile Defense Initiative

1) Participation in SDI Studies

In March 1985, the US invited its allies, including Japan, to participate in the Strategic Defense Initiative (SDI). This was the very first opportunity that Japan was involved in ballistic missile defense. The Government of Japan responded with a request to clarify several principles before agreeing on participation in SDI, namely: freedom for private industry participation and withdrawal; case-by-case decision on the participation of governmental organizations; establishment of a framework for industry participation; and the US guarantee that it would not impose a confidentiality clause. At the Bonn Summit in May 1986, Japan presented further conditions for participation in SDI: not to pursue superiority over the Soviet Union; to benefit from strengthened Western deterrence; to proceed with nuclear disarmament; to not undermine the Anti-Ballistic Missiles Treaty (ABM); and to discuss SDI development and deployment with allied countries.

Upon US agreement to these requests and conditions, Japan expressed its intention to participate in SDI studies in September 1986. In July 1987, the Japanese Government signed a Memorandum of Understanding (MOU) on SDI participation with the US (UK, West Germany, Israel, and Italy participated under separate agreements). In December 1988, the Western Pacific Missile Defense Study (WESTPAC) started and continued until April 1993.

In Japan, the defense industry was the one most eager to participate in the SDI. When the US invited its allies to join SDI activities, it was clear that participation in SDI would provide benefits to the industries of participants in economic and technological development terms. They recognized that Japan would need BMD for national security, and should strive to secure such technologies from an early stage of development as well as expand opportunities for domestic production under licensing or joint manufacturing.

On the other hand, the interests of the Japanese Government for participating in SDI were focused on how to mitigate tensions between the US and Japan in political, economic and trading

fields. The Japanese Government wanted to use SDI as a symbol of alliance ties.[1] Compared with the US and West European countries, Japan's threats perception about ballistic missiles attacks was not high. In this sense, the Japanese Government's decision to participate in SDI Studies was based on its desire to manage the Japan-US alliance relationships rather than acquire measures against such threats. It was quite evident that the Japanese Government took a passive approach to SDI in the form of agreement with the US: the WESTPAC Study was structured in the form of direct contract between the US Government and Japanese companies.[2]

2) Japan-US Joint NTWD Technology Study

After the Cold War, both the Japanese Government and public changed their views on national security, especially on BMD measures. These changed views reflected an increasingly unstable security environment in Northeast Asia, and build ups of ballistic missiles in neighboring countries. In case of the latter, the incidents that particularly heightened perception of ballistic missile threats in Japan were test launches of the North Korean No dong MRBM in May 1993, the Taepo Dong IRBM in August 1998, and finally the multiple missile launches in July 2006. North Korea has deployed about 200 No dong missiles that can cover whole of Japan. China has also deployed about 100 MRBM missiles including DF-21 that pose potential threats against Japan. Such situations prompted awareness that Japan should possess a BMD system, not only to reinforce the Japan-US alliance, but also to address actual ballistic missile threats faced by Japan. Such threat perception is an important factor that has accelerated the promotion of ballistic missile defense in Japan.

As mentioned before, the first instance that prompted such reaction was the North Korean No Dong launch in May 1993. Japan and the US agreed in December 1993 to establish a "Japan-US Working Group on TMD (TMDWG) to analyze threats and technological issues. In September 1994, both countries agreed to start a "Japan-US Joint Study on Ballistic Missile Defense," while Japan independently conducted a "Comprehensive Survey on National Air Defense System" from

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[1] See Gregg A. Rubinstein, "Emerging Bonds of U.S.-Japanese Defense Technology Cooperation," *Strategic Review*, Vol. XV, No. 1 (Winter 1987), p. 47; Ken Jimbo, "A Japanese Perspective on Missile Defense and Strategic Coordination," *The Nonproliferation Review*, Summer 2002, p. 57.

[2] One important factor as the background of Japanese Government's passive posture was the political situation of Japan at that time. On the participation of Japan in SDI and WESTPAC, see Hamm and Weinrod, "The Transatlantic Politics of Strategic Defense," pp. 721-728; Michael J. Mazarr, *Missile Defences and Asian-Pacific Security* (New York: St. Martin's Press, 1989), p. 85; Takashi Kawakami and Ken Jimbo, "Ballistic Missiles Defense and Japan-US Alliance: Policy-Making Process and Future Prospects of Japan-US Joint Research," Satoshi Morimoto (ed.), *Missile Defense: The New Structure of International Security* (Tokyo: Japan Institute of International Affairs, 2002), pp. 263-265 (in Japanese); Hiroshi Tajima, "WESTPAC: Reasons for Proposing Missile Defense," Speech for the Seminar at Peace and Security Research Institute, Tokyo, January 26, 2000 (in Japanese); Hiroshi Tajima, "Technological Cooperation in Missile Defense: Utilizing the Creativity of Industries," Second Meeting of Japan-US Security Expert Meeting, Tokyo, November 21, 2003 (in Japanese).

1995 to 1998 and thus advanced study of the technological potential of BMD.

In the process of such review, Japan initially showed interest in the Theater (currently called Terminal) High Altitude Area Defense (THAAD) system, but later inclined toward the Navy Theater Wide Defense (NTWD) program, reflecting: Japan's island geography; possession of Aegis ships that could be used as NTWD platforms; and the fact that NTWD was at an initial stage of development unlike other programs, so there was sufficient room for Japanese companies to participate.[3]

Moreover, North Korea's Taepo Dong launch in August 1998 strongly influenced not only the US but also Japan on its BMD policy-making. In September 1998, Japan and the US agreed to start joint technology study of the NTWD, which received the Security Council of Japan and Cabinet approval the following December. This Japan-US Joint Technological Study targeted four aspects of the NTWD SM-3 interceptor missile, including the nose cone, kinetic warhead, infra-red seeker, and second stage rocket. According to the Chief Cabinet Secretary Statement on joint Japan-US technology study of Ballistic Missile Defense in December 1998, transition from technical research stage to development, and then deployment stages would be determined separately "after thorough review of the technological feasibility of BMD as well as the concept of Japan's future national defense." Behind such a cautious approach to the joint technology study seemed to be the intention of the Japanese Government to retain flexibility in future policy-making.

3) Building and Joint Development of Ballistic Missile Defense (BMD)

Upon the US decision to deploy an initial MD capability in December 2002 as well as the results of the various tests on missile defenses, the Japanese Government determined that BMD had high technological feasibility. As BMD would be more suitable to Japan's exclusively defense-oriented policy, the Japanese Government decided[4] to introduce BMD at the Security Council of Japan and Cabinet Meetings of December 2003.

Tables 4-1 and 4-2 show the results of PAC-3 launch tests and their operation during the Iraqi War. Table 4-3 shows the results of the tests of SM-3.

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[3] Kawakami and Jimbo, "Ballistic Missiles Defense and Japan-US Alliance," p. 269.
[4] The fact that Japan was the first US allies to decide on the procurement of multi-layer BMD system was described in Ronald T. Kadish, Director, Missile Defense Agency, "Statement," Before the Senate Armed Services Committee, March 11, 2004.

Table 4-1 Result of Launch Tests (PATRIOT PAC-3)

Test date	Name of the tests	Target	Result
Mar. 21, 2002	OT/DT-1	HERA Ballistic Missiles	◎Success
Apr. 25, 2002	OT/DT-4	Reconfigured PAAT (Patriot)	△Failed to destroy warheads
May 29, 2002	OT-2	HERA Ballistic Missiles (equipped with reentry body)	◎Success
Mar. 4, 2004		PAAT (reconfigured Patriot)	◎Success
Sep. 2, 2004	DT/OT-11	PAAT (reconfigured Patriot)	◎Success
		MQM-107 (simulated cruise missiles)	◎Success
Nov. 18, 2004	DT/OT-12	PAAT (reconfigured Patriot)	◎Success
		STORM	◎Success
Sep. 8, 2005	Test after revising software	PAAT (reconfigured Patriot)	◎Success

PAAT: Patriot as a Target DT: Development Test OT: Operation Test

Table 4-2 Use of Patriot Missiles during the Iraqi War (Against ballistic missiles)

Launched date	Launching Troops	Target	Result (Some of them estimated by MHI)
Mar. 20, 2003	No. 101 Airborne Division	Ababil-100	◎Shot down, using PAC-2×1, and GEM×2
	US Army	Ababil-100	◎Shot down, using PAC-3×2
	US Army	Ababil-100	◎Shot down, using GEM×1
Mar. 21, 2003	Kuwaiti Army	TBM	◎Shot down, using GEM×3
Mar. 25, 2003	Kuwaiti Army	Al-Samoud	◎Shot down, using GEM+×1
Mar. 26, 2003	Kuwaiti Army	TBM	◎Shot down, using GEM×1
Mar. 27, 2003	US Army	Unknown	◎Shot down, using GEM×2
Mar. 29, 2003	Kuwaiti Army	TBM	◎Shot down, using GEM×1
Apr. 1, 2003	US Army	TBM	◎Shot down, using PAC-3×1

TBM: Theater Ballistic Missile GEM: Guidance Enhancement Missile PAC: Patriot Advanced Capability

Table 4-3 Result of Launch tests (SM-3)

Test Date	Test Names	Targets	Result
Jan. 15, 2002	FM-2	Aries Ballistic Missile Target	◎Direct Hit
June 14, 2002	FM-3		◎Direct Hit
Nov. 21, 2002	FM-4		◎Direct Hit
June 17, 2003	FM-5		× Captured Target but failed to hit it
Dec. 11, 2003	FM-6		◎Direct Hit, altitude 137 km, relative velocity 3.7 km/sec
Feb. 24, 2005	FTM04-1	Short Range Target Missile	◎Direct Hit
Nov. 17, 2005	FTM04-2	Target with separated warheads	◎Direct Hit
Mar. 6, 2006	JCTV-1	---	◎ (Succeeded using a nose cone developed from Japan-US Joint Research

FM: Flight Mission, FTM: Flight Test Maritime, JCTV: Joint Control Test Vehicle

(Table 4-1 to 4-3 are from Defense Technology Journal <http://www.mda.mil/mdalink/html/newsrel.html>)

The Japanese Government explained its need and purpose of missile defense as follows: in recognition of the need for comprehensive measures against the proliferation of weapons of mass destruction (WMD) and ballistic missiles and in consideration of the urgency with which the international community must respond to such proliferation, new threats including the activities of international terrorist groups, and various situations that may affect peace and safety, Japan will systematically coordinate increased diplomatic efforts and effective use of Japan's defense capability, while solidifying the Japan-US security arrangement.

While the direct purpose of BMD system development is to intercept ballistic missile flying toward Japan, the statement indicated that Japan also expected benefits such as: ① preventing the proliferation of WMD; ② implementing strategic deterrence against ballistic missile attacks; and ③ contributing to the US MD efforts.

A Chief Cabinet Secretary statement announced the same day in December 2003 explained that Japan would develop a new National Defense Program Guideline and Mid-Term Defense Program and, since BMD systems had high technological feasibility and were suitable for the exclusively defense-oriented policy of Japan, the Japanese Government would consider developing and deploying a multi-layer defense system consisting of the Aegis BMD and Patriot PAC-3 systems.

In the separate table attached to the National Defense Program Guideline adopted in December

2004, the core units with major equipment applicable for BMD are four Aegis ships and three ground-based Anti-Ballistic Missile Groups. Based on this Guideline, Mid-Term Defense Program (Fiscal Year 2005-09) was made and its yearly procurement program has been implemented. The budget for BMD System procurement has been allocated since FY 2004 (under the former Mid-Term Defense Program) as indicated in Table 4-4.

Table 4-4: Ballistic Missile Defense related budget in Japan (fiscal 2004 to fiscal 2006)

Fiscal Year	Outline
FY 2004 Gross amount 106.8 billion yen	Procurement of BMD system (92.2 billion Yen) ・ Sea-based upper-tier weapon system ➢ Refit Aegis system with BMD capability (one ship) ➢ Acquire SM-3 missiles ・ Land-based lower tier weapon system ➢ Refit Patriot systems with BMD capability (one ground-based Anti-Ballistic Missile Group) ➢ Acquire PAC-3 missiles Improved BADGE systems, study of future BMD systems (14.6 billion Yen) ・ Command, Control and Communications System ➢ Add Ballistic Missile response functions to BADGE system ・ Japan-US Joint Technology Research ➢ Japan-US Joint Technology Research on future sea-based upper-tier system. ➢ Comprehensive survey and study on Japan's anti-air systems ➢ Participation in international BMD conference Strengthened promotion of BMD systems ・ To promote BMD, a new Office of Ballistic Missile Defense was established under the Defense Policy Bureau of JDA to strengthen implementation of policies related to BMD measures. ・ Improve Patriot systems (one fire unit), and acquire PAC-3 missiles. ・ Improve BADGE systems, and study future BMD systems ・ Reinforce a system to promote BMD
FY 2005 Gross amount 119.8 billion Yen.	Procurement of BMD systems (119.8 billion Yen) ・ Sea-based upper-tier weapon systems ➢ Refit Aegis system with BMD capability (one ship) ➢ Acquire SM-3 missiles ➢ Launch tests of SM-3 missiles ・ Land-based lower-tier weapon systems

	➢ Refit Patriot systems with BMD capability (one ground-based Anti-Ballistic Missile Group) ➢ Acquire PAC-3 missiles ・ Command, control and communications system ➢ Add Ballistic Missile response functions to BADGE system ➢ Develop Tactical Data Exchange Systems (TDS) Study on future BMD systems (one billion Yen) ・ Japan-US Joint Technology Research ➢ Japan-US Joint Technology Research on future sea-based upper-tier systems ➢ Participation in international BMD conference
FY 2006 Gross amount 139.9 billion Yen	Procurement of BMD systems (136.1 billion Yen ・ Sea-based upper-tier weapon systems ➢ Refit Aegis system with BMD capability (one ship) ➢ Acquire SM-3 missiles ➢ Launch tests of SM-3 missiles ・ Land-based lower-tier weapon systems ➢ Refit Patriot systems with BMD capability (one ground-based Anti-Ballistic Missile Group) ➢ Acquire PAC-3 missiles ・ Sensors ➢ Develop new early warning radar (FPS-XX) ➢ Improve the capability of FPS-3 ➢ Operational research using FPS-XX trials ・ Command, control and communications system ➢ Develop TDS Research and development of future BMD systems (3.8 billion Yen) ・ Japan-US Joint Study ➢ Japan-US joint development of interceptor missiles with improved capability for Ballistic Missile Defense ➢ Japan-US joint study to improve capability of ship-based anti-air radar and theater command systems ➢ Participate in international BMD conference

(Reference) Japan Defense Agency "Defense Power Development and the Outline of its Budget for FY 2006 (proposal)" p.6; Japan Defense Agency "Defense Power Development and the Outline of its Budget for FY 2005 (proposal)" p.8; Japan Defense Agency, "Defense Budget for FY 2006 (proposal)" p.11 (all are written in Japanese).

According to the original program, Japan aimed to introduce PAC-3s in FY 2006, add four Aegis ships with BMD capability, 16 PAC-3 Fire Units, four FPS-XX units, seven FPS-3 Mod (with improved capability) units, and develop a BM/C4I system that will integrate all of these elements.[5]

When North Korea launched its ballistic missiles in July 2006, Japan already had Aegis ships, EP-3 electronic intelligence aircrafts, P3-C patrol aircrafts, and YS 11-E electronic reconnaissance aircrafts. With them and the added capability of already tested FPS-XX radars for monitoring ballistic missile movements, Japan was able to successfully track the most of trajectories of fired ballistic missiles, but it did not have intercept capability and was still on the way to developing its BMD system as a whole.

In response to the North Korean missile launches, the then JDA Director-General Fukushiro Nukaga announced changes in Japan's BMD development plan. PAC-3, scheduled to start operation from 2007, will be deployed to Iruma Base (Saitama Prefecture) as soon as possible in FY 2006. PAC-3 deployments to Kasumigaura (Ibaraki Prefecture), Narashino (Chiba Prefecture) and Takeyama (Kanagawa Prefecture), originally scheduled by the end of FY 2007 have been moved up several months. In addition, the Japanese Government is considering an acceleration of PAC-3 deployments to Hamamatsu (FY 2008), Chubu-Kinki (FY 2009) and Kyushu (FY 2010) Region. For Aegis BMD, the plan is to equip one Aegis ship per year with BMD capability, starting from FY 2007. Thus completion of the overall plan for introducing BMD systems may be moved up FY 2011.[6] Moreover, Japan will also consider an accelerated introduction of the FPS-XX radar, originally intended to begin from FY 2008 and continue for four years to establish four radar monitoring sites.

SM-3 (Block 1A) and PAC-3 missiles are being introduced through Foreign Military Sales (FMS) from the US. Given the current situation with North Korea, it is appropriate for Japan to import these missiles as it urgently needed to develop BMD capability. In case of PAC-3, Japan and US signed a licensed production MOU in March 2005.

Japan also decided to advance Joint Technology Research on SM-3 that started in 1999 to SM-3 Cooperative Development (SCD). The related statement of the Chief Cabinet Secretary noted that as a result of Japan-US Joint Technology Research, initial technological difficulties were about to be resolved, and the Cabinet found it more appropriate to promote the Japan-US Joint Development on improved BMD missiles more effectively, while also considering continued fiscal

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[5] Japan Defense Agency, *Defense of Japan 2005 White Paper*, p. 149 (in Japanese).
[6] See *Yomiuri Shimbun*, July 8, 2006; *Yomiuri Shimbun* August 5, 2006.

difficulties. It also made it clear that transition into deployment would be determined on the outcome of the SCD and other factors. For SCD, Japan is to develop a nose cone for the improved SM-3 Block IIA missile, second and third stage rocket motors, and the upper and lower separating segments (the flight control section) of the second stage rocket motor. The infra-red seeker, kinetic warheads, and overall system design will be developed jointly (US lead), and the US will develop the missile guidance segment, boosters, and system integration.[7] In its FY 2006 budget request, JDA allocated about 3.8 billion Yen for SCD.

One specific feature of this SCD program is Japan's adoption of a "spiral development" approach. Despite the fact that tests based on Joint Technology Research had only taken place in early 2006, Japan has gone ahead on transition to Joint Development, which reflects the actual application of the spiral development concept.

4) Japan's Plan to Procure and Operate Ballistic Missile Defense (BMD) Systems

a. Concept of Procuring and Operating BMD Systems

Japan decided to deploy multi-layered BMD system to intercept ballistic missiles by Aegis ships in the mid-course phase and by Patriot PAC-3 in the terminal phase. In addition, Japan will have sensors to detect and track ballistic missiles approaching Japan, and command, control and communication systems to effectively link weapons and sensors for systematic response to ballistic missile attacks.

b. Sensors

Sensors for Japan's BMD system include FPS-3 Mod (upgraded domestically produced radar), FPS-XX radars developed for BMD, and SPY-1 radar on Aegis ships. In addition, a US mobile X-Band radar has been deployed to the Air Self-Defense Force (ASDF) Shariki Base in Aomori, Northern Japan.

(i) Existing Radars (improved): FPS-3 Mod

This will add BMD capability to FPS-3, search radar used by the ASDF with L-Band and S-Band antennas. Seven FPS-3 units are to be upgraded.

(ii) New Radar (under development): FPS-XX

This is a three-dimensional active phased array radar with capability against ballistic missile and stealth aircraft targets. This radar was developed and tested during 1999-2003 by JDA's

[7] See *Tokyo Shimbun*, December 24 (evening edition); *Asahi Shimbun*, December 25, 2005.

Technical Research and Development Institute (TRDI). Four sets are to be deployed from FY 2006. Following the North Korean missile launches in July 2006, JDA decided to keep the FPS-XX being used for demonstration tests in Asahi City, Chiba Prefecture, to monitor ballistic missile launches.

(iii) Aegis Radar: SPY-1

This three dimensional phased array radar is used on Aegis ships. It can be used to not only detect and track ballistic missiles but also provide fire control for intercepts. Although Japan's four Aegis ships already in active service have some capability to detect and track ballistic missiles, they are being modified to add weapons control capabilities for introduction after FY 2007. Some US Aegis ships deployed to Japan will have BMD capability as well.

(iv) X-Band Radar: FBX-T

This US three-dimensional X-band active phased array radar can detect, track, and classify ballistic missiles. This mobile radar is transportable by C-130 and ground vehicle. Japan and the US agreed to deploy this radar to the ASDF Shariki Air Base (Aomori Prefecture) from the summer of 2006 (actual deployment from June 2006).

c. Weapons

Weapons include Aegis BMD for mid-course defense and Patriot PAC-3 for terminal defense. The US has already deployed Aegis BMD to Japan, and Patriot PAC-3 will deploy soon.

(i) Aegis BMD

Aegis BMD uses the Standard Missile 3 (SM-3), a three-stage missile with over 1000 km range that is said to be capable intercepts up to the 200 km or higher altitude. SM-3 is designed to intercept ballistic missiles in outer space during mid-course flight. It uses inertial guidance for initial and mid-course flight and infra-red sensors for terminal phase guidance. SM-3 uses a kinetic energy warhead for "hit-to-kill" intercepts. Aegis BMD upgrades are being installed in Japan's four Aegis ships for deployment from the end of FY 2007. The US will meanwhile increase its Aegis BMD force with deployment of the missile intercept-capable Aegis cruiser *Shiloh* to Japan from August 2006.

(ii) Patriot PAC-3

Patriot PAC-3 intercepts ballistic missiles at the terminal phase of their flight within the atmosphere. As in the case of Aegis BMD, it uses "hit-to-kill" technology and is compatible with conventional Patriot PAC-2 (four can be loaded into one PAC-2 container). JDA plans to add

PAC-3 capabilities to 18 Patriot Fire Units (16 for actual deployment and two for education and training). The US has been deploying PAC-3s to Okinawa since 2006.

d. Command, Control, Battle Management & Communications (C2BMC) systems

Command, Control, Battle Management & Communications (C2BMC) systems consist of JADGE, Aegis combat systems and Patriot ECS.

(i) JADGE

JADGE (Japan Aerospace Defense Ground Environment) has improved capability with added BMD functions over Japan's conventional command and control system for air defense (BADGE). Combined with the Air Defense Command System (ADCS), and Tactical Network Communication System (TNCS), JADGE will perform C2BMC for ballistic missile defense. The C2 function of BMD is centralized and linked to the Air Operations Control Center (AOCC) used by the JASDF Air Defense Commander who will be the Joint BMD Task Commander of all SDF assets assigned to BMD. JADGE is designed for control over Aegis combat systems and Patriot ICC (Information Control Center) as well.

(ii) Aegis Combat System

The Aegis Combat System integrates various maritime operations carried out by Aegis ships with the additional function of BMD. This system consists of the Aegis Display system, Weapons Control system, Decision Making system, and integrates command and control of sea-based sensor and weapon systems including the SPY-1 radar and SM-3 missiles.

(iii) Patriot ECS

Upon the receipt of an order from the ICC (Information Control Center) at each ground-based Anti-Ballistic Missile Group, the Patriot ECS (Engagement Control Station), the core system of the Patriot Air Defense System, will control radar, detect and identify targets, determine the order of engagements, and carry out missile defense operations under various modes.

e. Satellite information

Data warning of ballistic missile launches will be obtained from Japan's information collecting satellites and US early warning satellites.

(i) Information Collecting Satellites

In response to the launching of Taepo Dong 1 from North Korea in August 1998, Japan decided to introduce four information collecting satellites: two optical satellites with 1 meter resolution and

two radar satellites with 1 to 3 meters resolution. In 2003 Japan launched two satellites (one optical, and one radar), and the other two were launched in FY 2006. Due to its Diet Resolution on the Peaceful Use of the Space, the resolution capability of Japan's information collecting satellites are about the same as available commercial satellites. They are operated by Cabinet Satellite Information Center under the Cabinet Information Office.

(ii) Early Warning Satellites

Any information on ballistic missile launches detected by US early warning satellites (DSP satellites) would be used as Shared Early Warning (SEW) for cueing the early detection of launches by land and sea-based radars. Japan currently lacks such capability.

f. Operational Flow from the Detection to the Interception of Missiles

Information indicating ballistic missile launches would be conveyed from US Forces to the JDA Central Command Post and JASDF AOCC, and then to the Prime Minister's Office, relevant government agencies, and relevant SDF departments. Considering this and other relevant information, the Prime Minister and relevant Ministers would issue response commands based on pre-determined "response procedures." The Joint BMD Task Commander would determine the preparation and order of responses and send orders to unit commanders, while coordinating BMD operations with US Forces at the BJOCC.

There are two different command and control methods of response against incoming ballistic missiles. Under the "centralized method," all target information is aggregated at the AOCC. Target information from FPS-3 Mod, FPS-XX and US Forces X-Band radar is conveyed to the AOCC through the TNCS. Any information from Aegis ships is conveyed to the JADGE AOCC through communication satellites and AWACS using LINK16. JADGE then conveys such information to other sensors and weapons, while also connecting to US Forces through the ADSI (Air Defense Systems Integrator). JADGE compares the information on missile position, velocity, angle, etc. with stored data on the trajectories of various missiles to determine the expected area and time of impact. Then, JADGE uses this calculation to determine what degree of threat the missile(s) will pose to Japan and, if determined to be a threat, select the most appropriate weapons and issue the intercept command. Based on that command, Aegis ships launch SM-3 missiles for mid-course intercept while Patriot PAC-3 units intercept at terminal phase, and determine the results.

Under the "decentralized method," target information is shared within C2BMC with the AOCC as a core, as in the case of the centralized method. But, rather than issue an intercept order, the

AOCC delegates intercept authority to the commanders of Aegis ships and/or PAC-3 units, in accordance with launch procedures predetermined by the Joint BMD Task Commander. Then those commanders intercept incoming missile(s) at their own discretion. In such cases, commands issued from the AOCC would be "negative control," so commands would be "hold fire" or "self-destruct" interceptor missiles already launched.

Whether to adopt centralized or decentralized method will be determined depending on the strategic or tactical environment and the missile defense posture of Japan.

2. Problems and Solutions for Ballistic Missile Defense

1) Accurate and Quick Response

Since ballistic missiles fly at extremely high speed, defense against them will require an extremely accurate and quick response. The time of flight to target for ballistic missiles is usually several minutes to several tens of minutes depending on the types of missiles and the distance to target. For example, in the case of the SRBM Scud missiles launched during the Gulf War in 1991 it took about two minutes from the time of detection by satellites to the issue of early warning information — only about two minutes before the missiles hit the ground. It took about 10 minutes for the North Korean Taepo Dong 1 missile launched in 1998 to reach Japanese air space.

BMD for Japan, basically designed to respond against theater ballistic missiles with relatively short flying times, needs to respond in similar situations. Therefore, Japan should establish a BMD system at a level of operational readiness that can provide accurate and quick response within 10 minutes from missile detection to interception. For this operation, it is necessary to implement early warning of launching, classification and identification, and distribution of warning and data using information obtained through various sensors such as satellites and radars.

a. Use of Satellites

Since the time from detection to interception is extremely short, it is very important to detect the launching of ballistic missiles as early as possible. Detection requires a broad monitoring network in constant operation and early detection of incoming ballistic missiles is difficult for land-based radars. This is why it is essential to use satellites that can monitor constantly. The US implemented a Missile Defense Alarm System (MIDAS) program during the Cold War, and launched Defense Support Program (DSP) satellites in geo-stationary orbits to monitor Soviet and Chinese ballistic missile launchings. DSP satellites first detected the North Korean missile launches in July 2006. For the future, the US plans to launch SBIRS (Space Based Infrared

System) satellites and is also working on the development of a Space Tracking & Surveillance System (STSS) that has infra-red sensors covering wider and narrower range bands: the wider range sensor to detect heat sources from missile launch, and the narrower range sensor to track objects with higher precision.

Japan planned to launch two out of four information gathering satellites with optical and radar sensors in FY 2006. However, as the US has already established a strong information collecting capability through space-based sensors like DSP, it is impossible for Japan to the supersede US network on its own for the foreseeable future. Therefore, effective operation of BMD in Japan requires closer linkage with the US to share information on ballistic missile launches.

b. Use of Various Radars

As noted above the US X-Band Radar was installed at Shariki Air Base in June 2006. The US developed this X-band radar to protect its overseas forces, and those allied and friendly countries, through detection of incoming ballistic missiles. Using Boost Phase detection and tracking, it can also alert BMD systems to ballistic missiles approaching US territory.

FPS-XX is a land-based early warning radar developed by Japan. Four are to be deployed from 2009 till 2012. Until completion of FPS-XX deployments, the US X-band radar will be the only land-based radar in Japan that can detect ballistic missiles over a broad range.

Because of its specific wavelength features, the X-band radar complements the functions of FPS-XX. X-band radar is used exclusively for ballistic missile detection. FPS-XX, on the other hand, uses a lower wavelength band to detect and track aircraft as well as missiles. Thus FPS-XX has better capability to continuously monitor airspace, but is not as precise as X-band radar. Moreover, X-band radar can discriminate between real warheads and decoys, but tends to be more affected by weather than the FPS-XX radar. Since both types of radars have complementary performance, effective BMD operations should combine the use of both.

Deploying X-band radar in addition to FPS-XX will improve the accuracy of information through multiple sensors with different performance. This will raise the certainty of missile interception, as well as enable the calculation of expected impact area and time more quickly and accurately. Moreover, since incoming ballistic missiles may carry decoys, it is important to identify which incoming objects are real warheads. In this respect, X-band radar is extremely efficient and can increase interception probabilities.

The final report of Japan-US Security Consultative Committee (SCC: "2+2") in May 2006 states that SM-3 armed US Aegis ships will be deployed around Japan within 2006. This plan has been accelerated in reaction to the North Korean missile launches. The first Japanese Aegis ship equipped with BMD capability will deploy in FY 2007. By distributing target data obtained by X-band radar to Aegis BMD ships, it become possible to detect missiles launchings earlier than by use of their SPY-1 radars alone, and thus raise the accuracy, precision, and timeliness of missile interception. The target data obtained by X-band radar will be distributed to Patriot PAC-3 sites at the same, thereby further raising the overall interception probabilities.

c. Functional C2BMC System

Information from SBIRS and STSS satellites, added to data from X-band radar and other sensors, will further improve the likelihood of ascertaining the launch and flight of ballistic missiles. However, the ultimate objective of BMD is to neutralize the incoming missiles. Therefore, the next important matter following the detection is Command, Control and Communications (C3). For C3 functions of BMD in Japan, it is necessary to establish a system in which information on ballistic missile launches is collected and analyzed immediately at the Japan-US Bilateral Joint Operation Coordination Center (BJOCC — to be described later), so both countries can coordinate operations at the earliest possible time. Moreover, to assuredly intercept ballistic missiles, it is necessary to build a system that can communicate precise position data of incoming missiles continuously and at real time to interception units.[See details of C2BMC in Chapter 7 of Part 2.]

2) Japan-US Joint Operation and Burden of Missions and Roles

Under the Japan-US Security Treaty, "[e]ach Party recognizes that an armed attack against either Party in the territories under the administration of Japan would be dangerous to its own peace and safety and declares that it would act to meet the common danger in accordance with its constitutional provisions and processes" (Article 5). Therefore, Japan and the US are to jointly respond to any attack on Japan. This has been the basis of joint Japan-US operations, yet whether the Japan-US security arrangement will effectively function in a time of emergency will depend on the effectiveness of joint actions by the Self-Defense Forces and US Forces. Japan and the US have defined joint operational responsibilities under the "Guidelines for Japan-US Defense Cooperation," and continue to prepare procedures, as well as improve the effectiveness of joint operations through training and exercises.

Japan and the US are reviewing joint BMD operations on the presumption that each country will use its own command system. The review has defined how US Forces are to cooperate with Japan in BMD operations and will in the future study such issues as: ① defining details of command and

control including operation of the Bilateral Joint Operations Coordination Center (BJOCC) and the Common Operational Picture (COP) based on differences in Japan and US command and control systems; ② information sharing and systems linkage; ③ procedures for prompt communication of launch information; ④ coordinated defense procedures; ⑤ Japan-US role sharing in damage control and repairs; ⑥ coordination with relevant ministries and agencies on air transportation control and frequency allocation; ⑦ procedures for training and exercises; and ⑧ acquiring US information for developing Japanese systems.

Consideration of Japan-US role sharing needs to focus especially on collecting and analyzing information, and intercepting missile attack. For information collecting and analysis, both countries need to share information obtained through various sensors that each country possesses. Japan should rely on the already established capabilities of the US for collection and analysis of strategic information at the moment. However, through information sharing Japan needs to gain the know-how needed for more autonomous capability in truly joint operation between Japan and the US. For example, Japan and the US need to complement each other in the area of information gathering by land-based radars.

For interception, the situation will differ depending on what capability Japan is to acquire, and what kind of units the US will deploy around Japan. Considering current policy and technology trends, it may be more efficient if boost phase operations are carried out mainly by the US, while mid-course defense is handled jointly and terminal phase operations are conducted mainly by Japan (other than some US operations to protect US bases).

The overall architecture for BMD has not yet been defined, even in the US. It is highly likely that defense systems will be deployed gradually as their technologies become feasible. Since entire BMD systems cannot be developed overnight, Japan needs to consider at least an overall direction for system development, such as what capabilities it must possess and how to share roles and missions with the US, to make BMD truly effective.[See details of Japan-US Joint Operations in Chapter 6 of Part 2.]

3) Autonomous Execution of Operations

We must bear in mind that even if we develop a monitoring network and necessary C3 systems, it will not be possible to defend Japan should there be any reluctance in the national will to engage ballistic missiles. It is true that Japan-US joint operation must be for Japan's BMD, but action to respond to missile attacks must be for Japan to decide at its own discretion. For Japan to rely on US judgment for such a decision would be to renounce its independence as a sovereign state.

For "autonomous execution" of ballistic missile defense, it is vital that advance review include crisis management and situation control measures not only for interception of ballistic missile attacks against Japan, but also in the case of accidental or politically motivated launchings of ballistic missiles. As described before, it is not easy to analyze data on tracking, classification, and identification of ballistic missiles after their launch, further shortening the time available for decisions. Given the possibility of intercepting ballistic missiles targeting a country other than Japan, or defense against space launch vehicle (SLV) loading satellites, Japan should also contemplate crisis management and situation control measures for these cases. It is also necessary to delegate authority significantly to JDA and Self Defense Force units to allow immediate and appropriate responses under tense situations.

4) Full Development of Joint Operation of SDF

In April 2002, the JDA Director-General ordered each Self-Defense Force Chief of Staff to review joint operations. The review indicated a need to "transform current readiness based on the independent operation of each Self-Defense Force to readiness based on joint operations" and "to unify activities supporting the Director-General from a purely military viewpoint on SDF operations." Reflecting such recommendations, the Japanese Government determined that, as part of its new National Defense Program Guideline adopted in December 2004, it would strengthen joint operations by improving the efficiency of existing organizations, while establishing a Chief of Joint Staff position, and reorganizing each Staff Office. On the basis of this decision, the former Joint Staff Council has been reorganized as the Joint Staff Office.[8]

Thus SDF operations will be conducted entirely as joint operations from 2006. For any major event, each Self-Defense Force is to organize a joint service unit, and assign an appropriate commander depending on services required. For example, in the case of BMD, the Commander of the ASDF Air Defense Force will be assigned as the Commander of a Joint BMD Task Force. Or, in the case of an earthquake, one of the District Commandants of the Ground Self-Defense Force, or in case of an invasion of an offshore island, the Commander of the Self-Defense Fleet will command the joint unit.

In case of joint operation with US Forces, each SDF was to respond individually to joint US Forces and adopt joint coordination when needed. With the shift to Japan's joint operation, SDF and US Forces are to jointly respond to major events, based on operational plans that embody joint views

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[8] Japan Defense Agency, *Defense of Japan 2005 White Paper*, pp. 123-127.

independently determined by each side under the initiative of the Joint Staff Office.

Japan's BMD system will include early warning radar units, land-based PAC-3 units of the ASDF and MSDF "BMD Maritime Units" including Aegis ships with SM-3 missiles, under the command of the Joint BMD Task Commander, who is the ASDF Commander of Air Defense Force. This entire system will be controlled by the ASDF JADGE system which will have added BMD functions.

Although Japan is developing a joint operation system for BMD, its actual procedures must still be addressed. For example, staff organization to assist the Joint BMD Task Commander should be reinforced. To ensure implementation of BMD operations, plans should be verified using peacetime training and simulations. It will be essential to ensure that GSDF and MSDF personnel will be constantly available for emergencies, as well as to staff the Joint BMD Task Command. Moreover, Joint Chiefs of Staff personnel must be ready to serve at the Japan-US Bilateral Joint Operation Coordination Center (BJOCC).

On the other hand, current reinforcement of the SDF "joint system" is limited to operational matters. The new Joint Staff Office does not have authority to handle personnel affairs and budget planning. Since the Joint Staff Office is responsible for the management of various projects as well as operational needs related to joint operations including BMD, it is doubtful if an organization with necessary authority in personnel and budget matters can smoothly enable a truly joint system. This issue requires future consideration.

Chapter 5 Issues and Measures of Policies

1. Position of Ballistic Missile Defense (BMD) in National Security Policies

The primary duty of ballistic missile defense in Japan is to protect the lives and assets of Japanese people against ballistic missiles attacks as indicated in the decision by the Security Council of Japan and the Cabinet Council in December 2004.[1] The National Defense Program Guideline for Fiscal Year (FY) 2005 and Beyond adopted in December 2004 (hereinafter referred to as "the new Defense Guideline") states that "Japan will establish the necessary defense force structure, including the introduction of ballistic missile defense systems, to cope effectively with ballistic missile attacks," one of the new threats and situations that Japan may face.

These statements clearly indicate Japan's will to defend itself from ballistic missile attacks, but there are many policy issues that must be addressed to actually establish necessary systems. The Japanese government's efforts to resolve such issues have offered a good opportunity to depart from the "theological debate" of national security policies in the past, thereby driving Japan to "reform" its national security policies in a manner more fitting with today's security environment. However, many policy issues remain unresolved. It is increasingly necessary for Japan to fully address issues not only in terms of ballistic missile defense but also in view of its overall national security.

One notable aspect of ballistic missile defense is that it could be construed as a weapon system that might affect the regional and international strategic environment because it is a measure to intercept strategic weapons, i.e., ballistic missiles. In this view, BMD could be called the very first weapon system with strategic implications that Japan has possessed since the end of World War II. Moreover, its introduction imposes a tremendous cost burden. Since BMD is such a valuable defense asset, Japan must use it "strategically" for establishing appropriate national security policies and building a more favorable security environment.

2. Legislative Aspect

1) Ballistic Missile Defense (BMD) and the Right of Self-Defense

Article 9 of the Japanese Constitution stipulates that "the Japanese people forever renounce war as a sovereign right of the nation and the threat or the use of force as means of settling international disputes" (item 1), and "land, sea, and air forces, as well as other war potential will never be maintained" (item 2). The Government's interpretation of Article 9 has been that it does

[1] Decision of the Security Council of Japan and the decision of the Cabinet Council "On Introduction of Ballistic Missile Defense System and Other Measures," December 19, 2003.

not deny the right of self-defense as a sovereign state; thus Japan clearly possesses the right of self-defense against armed attacks and possession of a minimum level of armed strength is allowed under the Constitution.[2] Requirements in exercising the right of self-defense allowed under the Constitution are the following: ① there is an imminent and illegitimate act of aggression against Japan; ② there is no appropriate means to deal with this aggression other than resort to the right of self-defense; and ③ the use of armed strength is confined to the minimum level necessary.

If ballistic missiles fly toward Japan and are recognized as armed attacks, then the SDF can exercise the sovereign right of individual self-defense allowed under the Constitution. On the other hand, it is theoretically possible that, though ballistic missiles are flying toward Japan, their intent is not clear. In such a case, it could be difficult for the SDF to exercise the right of self-defense. However, if they do not respond, Japan will suffer damage. Therefore, it has become necessary to allow SDF interception of ballistic missiles flying toward Japan even when a state of armed attack is unclear. To enable the SDF to respond in such situations (under strict civilian control), the Diet has passed revisions of the SDF Laws.

There are still further unresolved issues involved in the relationship between Japan's BMD system and the right of self-defense. Firstly, there would be the case where Japan engages in boost phase intercept. It is difficult to determine accurately whether ballistic missiles are targeted on Japan in their boost phase. Thus there is a possibility that such intercept action could be considered beyond that allowed under the right of individual self-defense.

Secondly, there is the issue of how BMD is related to the exercise of collective self-defense. The statement of the Chief Cabinet Secretary in December 2003 indicated that Japan's BMD system is essentially aimed at defending Japan, will be operated at Japan's own discretion, and will not be used to defend a third country. Therefore, the issue of collective self-defense right will not emerge. For actual BMD operations, Japan and the US need to exchange military information more closely than before. The Japanese government asserts that providing information gathered for the purpose of national defense is not deemed as the exercise of collective self-defense since it is natural for Japan and the US to exchange mutually required information. At the time of the North Korean missile launches in July 2006, Japan and the US exchanged detailed information on missile trajectories and impact locations.

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[2] The Japanese Government has maintained such an interpretation since the statement of Director-General Seiichi Ohmura at the Budget Committee of the House of Representatives, 21st Session (December 22, 1954).

Therefore, the problem is the case where Japan uses its BMD system to intercept missiles targeted on the US or US forces. The Japanese government's position has been that "it is beyond doubt that, as a sovereign state, Japan has the right of collective self-defense under existing international law. The government, however, is of the view that the exercise of the right of self-defense as permissible under Article 9 of the Constitution is authorized only when the act of self-defense is within the limit of the minimum level necessary for the defense of the nation. The government, therefore, believes that the exercise of the right of collective self-defense exceeds that limit and is constitutionally not permissible."[3] In other words, Japan is not allowed to intercept ballistic missiles having the US or US forces as targets because that would be interpreted as an exercise of the right of collective self-defense.

There are increasingly strong arguments in Japan that it may be more beneficial for Japanese security, the Japan-US alliance, and the fulfillment of obligations in the international community for Japan to change the interpretation of its Constitution, or to revise the Constitution itself, so as to allow the exercise of the right of collective self-defense under certain conditions. Prime Minister Shinzo Abe has emphasized actively tackling the issue of changing the interpretation. However, it will likely take considerable time before Japan can realize interpretational changes or revisions of the Constitution. If so, it would be worthwhile to consider to what extent Japan is allowed to use its ballistic missile defense in relation to the exercise of collective self-defense under the existing legislative systems.

Concerning ballistic missile attacks against US forces in Japanese territory, Japan can intercept such missiles as an exercise of individual self-defense because it concerns ballistic missiles entering Japanese territory. If the ballistic missile is targeted at US forces deployed adjacent to, but outside Japanese territories, Japan may also be able to use BMD systems as an exercise of its individual self-defense right if the expected impact area would be close to where Japanese Self-Defense Forces or Japanese ships operate.

On the other hand, those missiles clearly heading toward the US homeland are not likely to take a track flying over Japan. (See Figs. 5-1 and 5-2) Since the BMD system Japan is now deploying will not be capable of intercepting longer range ballistic missiles such as ICBMs, there is only a slim possibility of Japan using BMD in a way that can be construed as an exercise of collective self-defense. However, it may be unreasonable to do nothing against such ballistic missiles.

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[3] Answers to the question raised by Member of the House of Representatives Ms. Takako Doi about the "Fundamental Policy upon the Start of Koizumi Administration," presented on May 8, 2001.

Fig. 5-1 Ballistic trajectory from China to the US homeland

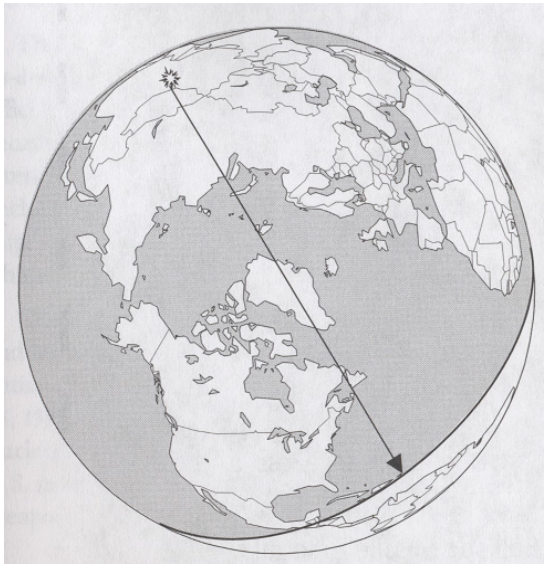
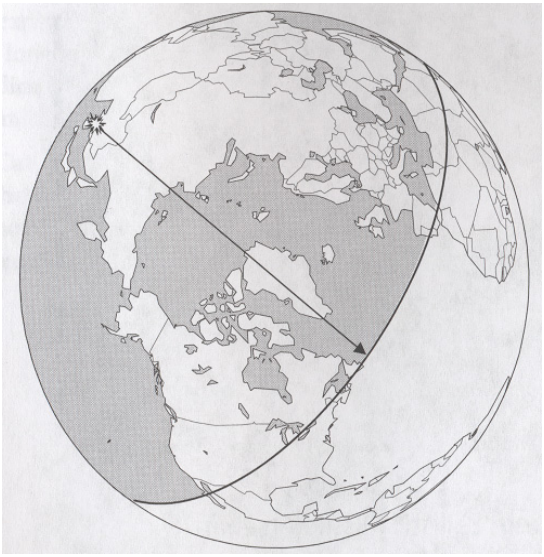


Fig. 5-2 Ballistic trajectory from North Korea to the US homeland



(Figs. 5-1 and 5-2 from the "Ballistic Missile Defense Handbook," Heritage Foundation)

According to Japanese media reports in January 2005, the Japanese government decided that BMD deployed in Japan would limit their targets to ballistic missiles targeting Japan, and would not intercept ballistic missiles flying over Japan toward other countries because of its interpretation of the right of collective self-defense.[4] However, JDA sources implied that if the impact area could not be determined, Japan had no choice but to intercept the missiles. Subsequent reports stated that the government started to contemplate a new interpretation of Article 9, whereby the interception of ballistic missiles flying over Japan would not be an exercise of collective self-defense even if the missiles were launched toward the US.[5] It is not clear how this contemplation is progressing, but Chief Cabinet Secretary Shinzo Abe told the Diet on April 17, 2006 that Japan is to follow the current interpretation that has been presented to Diet committees in the past.[6]

On the other hand, to provide information to the US immediately on ballistic missile flights would be a minimum obligation as an ally. The government's position on collective self-defense concerns actual employment of forces, so the provision of information does not constitute the exercise of

[4] *Tokyo Shimbun*, January 9, 2005.
[5] *Sankei Shimbun*, January 14, 2005.
[6] The statement of the Cabinet Secretary, Shinzo Abe, at the Special Committee on the Prevention of International Terrorism and Japan's Cooperation and Support; Humanitarian Assistance for Reconstruction in Iraq, the 164th session of the House of Representatives, April 17, 2006.

collective self-defense. This position has been repeatedly expressed at the Diet.

In view of the relationship between BMD and the exercise of collective self-defense, we must not forget that Japan does not possess nuclear deterrence capabilities but relies on the US extended nuclear deterrence, or nuclear umbrella, under the Japan-US alliance. This is not likely to change for the foreseeable future. In such a situation, exposure of the US homeland to ballistic missile attacks would hinder the US deterrent covering Japan. If Japan's BMD system can detect, track and intercept longer range ballistic missiles that are clearly heading for the US, allowing Japan to intercept such missiles will complement the US damage confinement capability against nuclear ballistic missile attacks, thereby strengthening the credibility and reliability of the US extended deterrence for Japan.

The credibility and reliability of extended nuclear deterrence is strongly affected by the closeness of relations between the providing and provided countries. If Japan is important for the US in security and other terms, this will heighten the credibility and reliability of the US commitment to retaliate against any nuclear attacks on Japan. It would not be appropriate for Japan to completely deny the possibility of intercepting ballistic missiles clearly aimed at the US homeland from the viewpoints of Japan's national security and the Japan-US alliance.[7]

As seen here, BMD and the issue of collective self-defense are directly related and remain a major challenge to Japan's defense legislation. Japan needs to resolve this issue before its BMD systems are actually deployed. As in the past, Japan may be able to provide a certain degree of response through expanded and extended interpretations of the existing legislation. However, that may not be a proper response as a constitutional state, and would hardly be healthy for Japan's national security policies in the longer term.

2) Revision of the Self-Defense Forces Law and the Law to Establish the Defense Agency

As underlined by the North Korean missile launches in July 2006, MRBMs such as No Dong can hit Japan within 10 minutes of launching. Interception of such missiles will require responses within a very brief time and under extremely tense conditions. There may also be cases of approaching ballistic missiles with unknown intent, in which case the government may not be able to order SDF operations. Even then it will be necessary to intercept such ballistic missiles to protect lives and assets in Japan.

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[7] Regarding the credibility and reliability of extended deterrence, see Shinichi Ogawa, "Nuclear Disarmament and 'Nuclear Umbrella'", Mitsuru Kurosawa (ed.), *Disarmament of Weapons of Mass Destruction* (Tokyo: Shinzan-sha, 2004), pp. 42-46 (in Japanese) .

In July 2005, the Diet adopted a revision to legislation permitting the SDF to conduct BMD operations in a way that conforms to the characteristics of ballistic missile attacks, by adding an "Article 82-2" to the Self-Defense Forces Law that would allow the SDF to respond to ballistic missile attacks even without the issuance of a governmental order for defense actions.

Moreover, when ballistic missiles approach Japan, it is essential that all three Self-Defense Forces conduct operations jointly through a series of procedures that involve: the detection, tracking, classification, and identification of targets; decision on intercept; actual interception; determination of results; decision on a possible second interception; and confinement of damage from debris in case of successful interceptions, and from missile impacts in case of failed interception. In July 2005, Japan revised the Defense Agency Establishment Law at the same time as the revision of the Self-Defense Forces Law, and established the Joint Staff Office to assist the Director-General of the Defense Agency, thereby shifting to a more unified joint operational structure. In relation to BMD, the joint task units, which consist of relevant service units from each Self-Defense Force, shall be formed when needed under the command of the ASDF Air Defense Command.

The shift to a more unified joint operation structure has been pursued under the recognition that each Self-Defense Force must simultaneously share information and act under unified command and control to systematically coordinate actions and effectively accomplish missions.[8] The introduction of ballistic missile defense has undoubtedly accelerated this shift toward more unified SDF operations. The next important step is to develop regulations and procedures for proper implementation of such legislation and establish procedures that would allow the Diet, the government, and the SDF to fully coordinate their actions.

3. Policy Aspects

1) Budget for Ballistic Missile Defense and Cost-Effectiveness

Since 2004 the budget for BMD system procurement has taken more than 10% of all annual JDA procurement expenses. The expense for BMD system procurement is expected to be enormous as substantial quantities of extremely advanced technologies are required: sensors, C2BMC systems and maintenance equipment in addition to missiles, and the refit of missile launch platforms such as AEGIS ships and Patriot systems.[9] The challenge is how to determine the proper budget for

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[8] Japan Defense Agency, *Defense of Japan 2005 White Paper*, pp. 123-124 (in Japanese) .
[9] Akio Shouno, "How to Pursue Defense Industry Policy," *DRC Almanac 2003*, 2003 [http://www.drc-jpn.org/AR-7J/syouno-03j.htm] (in Japanese) .

cost-effective BMD acquisition, and how to harmonize such expenses with other equipment procurement needs as well as other national security-related expenses.

On the cost-effectiveness of BMD, we should consider the expected damages from ballistic missile attacks, especially those using missiles armed with WMD warheads. If such damage is prevented or mitigated by deterring or intercepting attacks, even the enormous expenses required for the BMD system would still be worthwhile. Because Japan actually faces apparent threats of ballistic missile attacks, the BMD system is the only effective way to intercept such threats and, as its technological feasibility has been demonstrable, Japan's introduction of BMD can be called rational in terms of cost-effectiveness.

Furthermore, BMD would provide various benefits in addition to interception of ballistic missiles. It could deter missile launches, reduce motivation to acquire ballistic missiles or increase stockpiles, and be a driving force to promote reform of national security and defense policies in Japan. Conversely, because BMD will be extremely expensive to introduce, it should be put to use in a strategic and multi-purpose manner to maximize its effect. At the time of North Korea's missile launches in July 2006, Japan responded quickly with active and effective diplomacy at the UN Security Council. Japan's progress in introducing BMD, at least in tracking capability, was certainly a factor that enabled such response.

On the other hand, Japan needs to consider the possibility that introduction of BMD may hinder the development of other defense capabilities. The new National Defense Program Guideline states that "Japan's future defense capability should be a multi-functional, flexible, and effective force with a high level of readiness, mobility, adaptability and multi-purpose capability, and be equipped with advanced technologies and intelligence capabilities comparable to the global military-technological level." In spite of this, procurement funding in the new Mid-Term Defense Program is significantly reduced. Defense budgets are not likely to be increased for the moment, making it difficult to procure equipment needed to develop "a multi-functional, flexible, and effective force." Moreover, in the realignment of US Forces in Japan, the US is asking Japan to bear an expense of about 2 to 3 trillion yen, yet the Ministry of Finance says that all Defense Agency requests count as defense-related expenses and no expenditures outside the defense framework will be accepted.[10] There is also pressure to review and further shrink the budget for the Mid-Term Defense Program. After the North Korean missile launches in July 2006, Japan started to accelerate BMD development. More funding is needed for this to become a reality.

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[10] *Sankei Shimbun*, April 27, 2006.

Determining the proper scale of Japan's BMD system requires an estimate of threats Japan may face in the future and consideration of the BMD capability Japan is to introduce. However, as previously explained, introduction of BMD must consider not only ballistic missile interception measures in the context of the "Defense Capability" of the 5Ds, but also effective reduction of ballistic missiles threats by combining the other four Ds — Dissuasion Diplomacy, Deterrence Posture, Denial Power, and Damage Confinement — while efficiently using limited resources.

As BMD is the most important issue embodying Japan's "deterrence strategy" for the first time in Japan's national security policies, Japan should allocate BMD funding, as well as expenses related to the realignment of US Forces in Japan, in a separate framework outside the general defense budget to enable full consideration of other national defense priorities.

2) Three Principles on Arms Export

In 1967, Prime Minister Eisaku Sato presented the so-called Three Principles on Arms Export, under which arms exports were to be prohibited to ① communist countries, ② countries to which the exports of arms are prohibited by UN resolutions, and ③ parties involved or likely to be involved in international conflicts.[11] In 1976, the government of Prime Minister Takeo Miki announced even more strict regulations that restricted arms exports to any region, including those not designated in the above Three Principles, and to include arms technologies as well as equipment related to arms manufacturing.[12]

The basic concept of this prohibition on arms exports is that "Japan, as a peaceful country, is to avoid promoting international conflicts by exporting arms."[13] However, excessive application of this export ban has not only obstructed Japan-US cooperation in defense equipment and technology, but also Japanese contributions in areas that would benefit peace and stability in the international community. In 1983, Japan exempted the provision of arms technologies to the US as an exceptional case. However, Japan still could not transfer any hardware elements, even to the US. Thus Japanese-made components could only be used in Japan, thereby sky-rocketing the costs of such parts. [14]

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[11] The statement of Prime Minister Eisaku Sato to the Audit Committee of the House of Representatives, 55th Session, April 21, 1967.
[12] The statement by Prime Minister Takeo Miki to the Budget Committee of the House of Representatives, during the 77th Session.
[13] Ibid.
[14] Katsuhiro Shigemura, "Mitigation of Policies to Prohibit Arms Exports, and International Equipment Cooperation," *DRC Almanac 2004*', 2004 [http://www.drc-jpn.org/AR-8/shigemura-04j.htm] (in Japanese) .

In the case of BMD research, Japan confirmed that the provision of arms technologies under Japan-US joint technology research will be implemented under the framework of an agreement on the provision of arms technologies to the US.[15] However, it was acknowledged that some review of the Three Principles would be needed to advance to the next step of joint development. In December 2004, the Chief Cabinet Secretary's statement on the new Natural Defense Program Guidelines noted, "[i]f Japan decides that it will engage in joint development and production of ballistic missile defense systems with the US, …the Three Principles will not be applied, under the condition that strict control is maintained, because such systems and related activities will contribute to the effective operation of the Japan-U.S. security arrangements and are conducive to the security of Japan."

Although such exceptions to arms export principles have been restricted to exports to the US in regards to the BMD system, it is significant that Japan has been able to show flexibility in reviewing the application of the Three Principles policy. Through such measures, it may become possible to realize efficient production of SM-3s (or PAC-3s) through close coordination between Japan and the US. Moreover, if Japan and the US are to produce common equipment, then even if one country faces a sudden problem in production, such as a drastic increase in demand or a stoppage in production, the other country can provide production capability, making it possible for both countries to adapt a more flexible production schedule. For Japan's defense industry, such joint development will provide an opportunity to supply products to the US and could reduce costs through more efficient manufacturing.

Certainly, unrestricted exports of defense equipment and technologies cannot be allowed. Strict controls on any exports of technologies and equipment to third parties must continue.

3) Resolution for Peaceful Use of Space

In May 1969, Japan's Diet adopted the "Resolution on the Fundamentals of Exploitation and Use of Outer Space" (hereinafter referred to as "Resolution for the Peaceful Use of Outer Space"), which said that the exploitation and use of any objects launched into outer space or any rockets that boost such objects must be restricted to peaceful purposes, to benefit advancement in academic science and improvement in human welfare, while contributing to the development of industrial technologies and encouraging beneficial international cooperation. Therefore, military use of outer space has been prohibited not only for invasive purposes, but in principle for defensive purposes as well.

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[15] Statement of the Chief Cabinet Secretary, "On Japan-US Joint Technology Study on Ballistic Missile Defense (BMD)," December 25, 1998.

This resolution presents two major issues in relation to BMD. One is that the Aegis BMD system intercepts ballistic missiles flying above the atmosphere. The Chief Cabinet Secretary's Statement on Japan-US joint technological research in 1998, referring to this point, noted that while the Diet has discretion in determining its interpretation of this resolution, the Japanese government believes that, considering the recent proliferation of ballistic missiles and the fact that BMD is the only purely defensive method to protect the lives and assets of the Japanese people, the introduction of BMD by Japan does conform to the objectives of the Diet resolution as well as to the basic concept of Japan as a peaceful country.

Another matter lying between BMD and the peaceful use of space is the extensive use of satellites in BMD operations. The "peaceful purpose" stated in the Diet resolution is construed as "non-military" so that the SDF has been restricted on the use of outer space even for defensive purposes. In 1985, the Japanese government stated that the Self-Defense Forces were allowed to use general-purpose satellites or satellites having similar functions[16] (referred to as the "generalization principle") so the SDF has been allowed to use communication satellites.

Upon North Korea's Taepo Dong launch in 1998, Japan decided at the Cabinet meeting in December 1998 to introduce four information collecting satellites with resolution capability similar to commercial satellites (1 to 3 meters) based on the "generalization principle." However, such capability is useless for BMD operations. Japan needs more advanced information collecting satellites with better resolution capabilities. Japan's current space policies do not allow the possession of more advanced satellites that would have an important role in effective BMD operations either, such as early warning satellites with advanced infra-red sensors that can detect missile launches, or monitoring satellites to detect, track and identify ballistic missiles.

Internationally, the Japanese interpretation of the "peaceful use" of outer space is rather an exception. Although the principle of peaceful use of space has been adopted internationally, "peaceful use" has been interpreted to include use for defensive purposes that benefit the security of the international community as long as there is no intention to invade.[17] The aforementioned information collecting satellites and early warning satellites are for a non-aggressive purpose called BMD, so they could be allowed under the international community's interpretation. There

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[16] The government's unified view presented in the statement of the Director-General of the Defense Agency, Koichi Katoh, to the Budget Committee of the House of Representatives, February 6, 1985.
[17] Nippon Keizai Dantai Rengoukai (Japan Economic Federation), "Future Development of Defense Forces: Strengthening the Defense Production Capability and Technology Foundation," July 20, 2004 [http://www.keidanren.or.jp/japanese/policy/2004/063.html] (in Japanese) .

has been a growing argument that Japanese policy on the peaceful use of outer space should be reviewed to allow effective response to threats facing Japan.

The move toward such revision is accelerating. Government and private sector experts are now studying ways to review the Resolution on the Peaceful Use of Outer Space while aiming to incorporate space-related items in the Mid-Term Defense Program for FY2011 and Beyond.[18]

The space industry is essential for Japan not only in terms of national security but also as core infrastructure. However, the situation facing this industry is quite severe and its international competitiveness is declining. In order to revitalize it, Japan needs especially to review its principles for the peaceful use of outer space, and actively utilize space for various purposes, including non-aggressive military operations.

It is a good indication for Japanese security that discussion of such matters has become more serious following the North Korean missile launches in July 2006. Serious discussion of these issues will benefit Japan's national security posture.

4) System for Confidentiality

One obstacle to expanded Japan-US defense cooperation is the underdeveloped system of Military Information Exchange. The Confidential Information Protection Law based on the Japan-US Mutual Defense Assistance Agreement (MDAA) applies only to confidential information on equipment, not to operational information. Japan and the US have not agreed even on a "General Security of Military Information Agreement (GSOMIA)."

GSOMIA provides that ① the recipient country will guard the confidentiality of information to the same degree as the information provider country; ② any confidential information the recipient country receives from the provider country shall not be disclosed to any third countries without the approval of the provider country; ③ the recipient country shall not use the information for any purposes other than the original purpose of the information provision, and ④ the recipient country shall respect any individual rights concerning patents, copyrights, commercial secrets, etc., involved in the said information.[19]

Since there is no Japan-US GSOMIA, there have been restrictions on joint research of a broad

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[18] *Sankei Shimbun*, December 31, 2005.
[19] Noboru Houshuyama, "Japan-US Military Intelligence Confidentiality Agreement (GSOMIA)," "RIPS' Eye", Vol. 57 (January 2006) [http://www.rips.or.jp/Institute/rips_eye_no57.html] (in Japanese) .

range of technologies related to ballistic missile defense, and on the provision of operational information from the US to Japan, which is needed for any joint response, including BMD.

This situation has encouraged Japan and the US to conclude a GSOMIA for a comprehensive framework to protect confidentiality, and the two countries are reportedly negotiating such an agreement.[20] In order to agree on a GSOMIA, Japan needs to revise its defense information protection structure so that it will conform to a stricter standard. In the future, there may be a need to review domestic laws that contain more prohibitive punishment of offenders, as well as an expansion of the range of offenders. For the expansion of offenders subject to punishment, the laws should cover not only Defense Agency personnel now covered under the Self-Defense Force Laws and private companies related to defense equipment acquisition, but also those stakeholders with access to defense information, such as the officials of other ministries and agencies and even members of the Diet.

[20] *Sankei Shimbun*, January 30, 2006.

Chapter 6 Enhancement of Japan-US Joint Operations Structure

1. Needs and Significance of Japan-US Joint Operations

The US is far advanced in the technological and systematic development of BMD, and in reality Japan needs to rely on the US for many relevant technologies. In addition, due to its restriction on the use of the outer space for defense purposes, Japan has very limited collecting and analyzing capability for such key information such as preparation for missile launching. Moreover, the BMD system that Japan is now developing is limited in quality and quantity, even if its design allows the SDF to single-handedly respond to ballistic missile attacks. Especially when multiple numbers of missiles target Japan simultaneously, Japan's BMD system can provide only a limited response capability. Therefore, under the Japan-US security arrangement, it is appropriate to depend on the response capabilities of US Forces. Japan's efforts to build and operate a BMD system cannot be realized without close coordination with the US.

As described earlier, the Chief Cabinet Secretary's Statement in December 2003 said that the BMD system "will be operated based on Japan's independent judgment," and, at the same time, that "Japan will take all possible measures to ensure national defense…by promoting further cooperation with the US on technology and operation." The statement on "Japan-US Alliance Transformation and Realignment for the Future" adopted at the Japan-US Security Consultative Committee (SCC: "2+2") in October, 2005 described BMD cooperation as follows:

> "Emphasizing that BMD plays a critical role in deterring and defending against ballistic missile attacks, and can dissuade other parties from development and proliferation of ballistic missiles, both sides stressed the value of closely coordinating improvements in their respective BMD capabilities. To support these BMD systems, they emphasized the critical importance of constant information gathering and sharing, as well as maintaining high readiness and interoperability in light of the minimal time available to respond to a ballistic missile threat. The U.S. will deploy additional complementary capabilities in and around Japan when appropriate, coordinating their operations to support Japan's missile defense operations. Close coordination between respective BMD command and control systems will be critical to effective missile defense operations."

This document also noted the establishment of a Bilateral Joint Operation Coordination Center (BJOCC) at the Yokota Air Force Base, to ensure coordination and interoperability between the SDF and US Forces in Japan. Moreover, collocation of the ASDF Air Defense Command Headquarters with the Headquarters of the US Fifth Air Force at Yokota will strengthen coordination for BMD operations, as well as exchange of intelligence information through the

BJOCC. In addition, the US has deployed an X-band early warning radar at the ASDF Shariki Base in Aomori Prefecture, information will be shared to support Japanese BMD and damage control operations, and the US is deploying PAC-3 and Aegis/SM-3 forces to support its commitment under the Japan-US Security Treaty.

In January, 2006, then JDA Director-General Fukushiro Nukaga announced his thought to link information networks including Japan-US radar information and C2BMC systems. The systems linked will include Japan's FPS-XX, FPS-3 Mod, SPY-1 radar of Aegis ships, and C2BMC system, and US early warning satellites, X-band radar (FBX-T), and SPY-1 radar on Aegis ships.[1] At present, Japan does not have early warning satellites with suitable infra-red sensors, and the analysis capability of its information collecting satellites is considerably inferior to that of the US reconnaissance satellites. Thus for now Japan has no choice but to depend on the US for much of its early warning information on missile launches as well as preparation activities. The US, on the other hand, needs to obtain sensor information collected by Japan, which is closer to North Korea. Therefore, Japan's establishment of a system to provide such information would demonstrate true bilateralism.

The US aims to build a multi-tier BMD deploying various elements of these systems as they become available. As the responses at each stage of interception need to be conducted continuously, sensor information has critical importance in the sequence of these responses. How to integrate and coordinate various sensors positioned in space, air, ground and seas efficiently and without gaps is the key for destroying incoming ballistic missiles.

Among these sensors, only those deployed on the ground can be used continuously. The US mobile X-band radar in combination with the ASDF FPS-XX radars improve significantly the identification and classification of incoming ballistic missiles at the boost and mid-course phases, thereby contributing greatly to successful interception. Moreover, the radar also benefits to damage confinement by improving the precision in locating debris after missile destruction.

If above policies are implemented, Japan-US exchange of BMD information can advance to a much higher level and be conducted continuously. It is necessary for both countries to have close coordination in operations, such as agreement on coverage areas and the allocation of interceptor forces, to effectively utilize the BMD resources of both countries.

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[1] *Yomiuri Shimbun*, January 14, 2006 (evening edition) (in Japanese) .

On the other hand, developing BMD system in Japan will allow the US to depend Japan on a part of information collecting. Moreover, joint technology research, and the joint development projects started in 2006 will provide technology and funding support to US BMD development efforts. While there is considerable expectation on the contribution of US Aegis ships to Japan's ballistic missile defense, the key here is how to secure support capability in Japan for these ships. Japan's capability to provide rear area support is also critical for the operation of US surveillance and combat aircraft.

As seen here, Japan's geopolitical conditions and its development of BMD capability will support progress of the US MD program. If Japan and the US can realize a closer relationship in joint operations through exchange of information, Japan will provide an even greater contribution to US MD capability in the future.

Japan's defense cooperation for the US was called "burden sharing" during and immediately after the Cold War. Now, it has been transformed into "power sharing" partly through BMD development. Here, both Japan and the US will jointly respond to threats of ballistic missiles against Japan as well as regional emergencies. Japan's BMD system can help protect US Forces in Japan, and can contribute to the US response to ballistic missiles attacks on its territory, at least in the area of information sharing. If Japan-US joint operations for ballistic missile defense are conducted properly, US presence in Japan will be strengthened, as will the credibility of US extended deterrence.

Upon the realignment of US Forces stationed in Japan, there will be a need to reduce the burden of local communities in Okinawa, while maintaining and even strengthening deterrence power. The deployment of Japan's BMD system and the progress in Japan-US joint operations will contribute greatly to developments here as well.

2. Japan-US Joint Operation Systems

According to the Guideline on Japan-US Defense Cooperation, Self-Defense Forces and US Forces are, in principle, to conduct joint operations through the command and control system of each country based on its sovereign right. SDF operations under the current situation of constitutional restraints are thus mainly defensive, and US Forces are to provide supportive and complimentary operations. Any offensive operation is mainly for US Forces.

Japan's program for BMD is to build a system of early warning radars operated by the ASDF, sea-based BMD on SM-3 armed MSDF Aegis ships, and ASDF air defense units that operate

ground-based PAC-3 missiles, all under an integrated BMD unit commander from the ASDF Air Defense Command. The entire force will be controlled by the JADGE[2] (Japan Air Defense Ground Environment) C2BMC system.

The first step for smooth joint BMD operations is to acquire early warning information. Due to the short response time characteristic of ballistic missile attacks to Japan, it is essential to gain early warning information. As Japan has hardly any capability to do this, it needs to build a system that can use information gathered by early warning satellites of the US DSP (Defense Support Program).

As Japan's BMD system needs to establish smooth joint operations with US BMD systems being deployed in and around Japan, details of operation procedures must be defined. As noted previously, JDA policy is to promote an integrated BMD information network between Japan and the US that emphasizes the importance of early detection and tracking. JDA also stresses the need to closely link the ASDF automatic warning and control system that utilizes ground-based radar as well as Aegis radar networks, with the information from early warning satellites and independent radar network of the US, so to further develop monitoring capability.

Collocation of the ASDF Air Defense Command with the US Fifth Air Force Headquarters at Yokota air base will promote information sharing and coordination, while the new Japan-US Joint Operation Coordination Center (BJOCC) at Yokota will promote closer coordination of joint operations. A Joint Operation Plan for BMD will be prepared by the newly-established Joint Staff Office in cooperation with US Forces, and BJOCC will do the actual work of coordinating operations between Japan and the US.

3. Challenging Issues of Japan-US Joint Operations

1) Framework of Japan-US Coordination and Project Management

a. Framework of Dialogue and Coordination

In December 2004, one year after Japan decided on the introduction of a BMD system, Japan revised its National Defense Program Guideline, and introduced a new Mid-Term Defense Program. These programs stated intents to strengthen Japan-US security cooperation in the improvement of ballistic missile defense capability, as well as further promotion of cooperation in policies, operations, equipment and technologies. Based on this policy, Japan decided to conclude a new Memorandum of Understanding (MOU) on BMD cooperation with the US.

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[2] JADGE is operated by the Air Self-Defense Force. It used to be called BADGE but was renamed when the system was updated with changes in system coverage.

This MOU, called the Framework MOU, is different from the MOU on Joint Technology Research on the sea-based upper-tier system (NTWD: Navy Theater Wide Defense) started in 1999. The Framework MOU[3] sets general terms for cooperation on the development of BMD capabilities and covers various projects pertaining to information exchanges, joint research and development, and systems analysis. Specific joint project activities will be implemented under Annexes to this MOU. Japan and the US have established working groups for each project to coordinate concrete measures for joint BMD projects.

The "Guidelines on Japan-US Defense Cooperation" approved in 1997 stated that the SDF and US Forces are, in principle, to act under the command of each country to carry out preplanned operations and closely cooperate in: ① cooperation under normal circumstances; ② actions in response to an armed attack against Japan; and ③ cooperation in situations in areas surrounding Japan that will have an important influence on Japan's peace and security (situations in areas surrounding Japan).

To effectively conducted joint activities under such guidance, both countries are to coordinate a "Joint Operations Plan," which defines the actual cooperation between Japanese and US Forces in response to emergences, and a "Mutual Cooperation Plan" for emergencies in the area surrounding Japan. In relation to this, the Governments of Japan and the US have agreed to review a new defense cooperation framework to replace the current Guidelines. Both governments is expected to discuss such details as :① whether to revise the Guidelines to clarify the intent to promote joint defense cooperation against new threats of terrorism and ballistic missiles, as well as activities that contribute to the international community; or ② to develop a new framework by significantly revising the Joint Operations and Mutual Cooperation Plans.

Meanwhile, BMD systems development will be pursued within the Framework MOU, while operation plans will be developed through existing Japan-US coordination mechanisms. As each Force of US Forces will be responsible for the operation of mobile systems, Japan side needs to coordinate with the US Pacific Command as well as US Forces in Japan.

Unlike US BMD, Japan's BMD has overlapping operational areas between air and ballistic missile defense, so that operational plans for BMD and air defense also overlap in large areas. Considering this, it may be more appropriate to clarify the relationship between the Joint

[3] Japan Defense Agency, *Defense of Japan 2005 White Paper*, p. 157 (in Japanese) .

Operation Plan and Mutual Cooperation Plan under the existing Japan-US coordination mechanisms.

Furthermore, US Forces are likely to consider boost phase interception of ballistic missiles using airborne weapons such as ABL (Airborne Laser) in BMD operations in the region surrounding Japan, but such operation needs to be conducted closely with those of early warning and air combat support. It is very difficult to actually conducted BMD operations in a manner clearly divided from air defense operations. Therefore, it is necessary to have broad-ranged discussion and coordination through a new framework for joint BMD operations, in addition to the existing framework on the development of a joint operations system and preparation of joint operations plans.

b. Project Management

It is important to not only have an addition to effective coordination on joint operations, but also determine how to implement the outcome of such coordination; in other words, ① how to share expenses; ② how to implement projects and which side should be responsible for a given project; and ③ who to prepare and manage an overall schedule for the project.

Japan and the US need to review at the earliest opportunity the effects of the joint BMD projects being undertaken prior to conclusion of the Framework MOU, as well as policy projects related to transformation of US Forces or their realignment in Japan.

Even if Japan and the US agree on cooperation in joint operations, this will be difficult to implement unless JDA establishes a unified system to manage and promote projects to implement such cooperation. Therefore, it is preferable to establish unified project management systems based on close association between Japan and the US.

While US projects are implemented through Defense Acquisition Regulations (DOD FAR 5000 series), Japan does not have sufficient rules and regulations to handle such projects and those that exist differ considerably from those of the US. The most notable differences relate to project management. Among relevant rules and regulations in Japan, those concerning project management are undeveloped. Japan and the US also differ in the concepts behind project management. Such differences may obstruct projects related to the development and management of C2BMC, as these especially require closer coordination between Japan and the US. Moreover, the US has adopted a spiral approach in the development of MD systems, so to advance them phase by phase. Japan also needs to adopt the similar approach through joint development

projects on ballistic missile defense.

In the US, it is normal to appropriate expenses for project management, but in case of Japan such appropriation is quite rare. In the US, project management is often handled through Integrated Product Teams (IPT) of private and public sector personnel. In Japan, however, it is difficult even to set up a team consisted of public and private sector personnel unrelated to particular contracts. There is hardly such a thing as appropriating expenses for IPT activities. Thus both countries need to coordinate project management methods as well as integrate concepts of project management. This must be done by determining operational procedures for Japan-US coordination as well as by management of specification for system formats and interfaces.

2) Sharing of Information between Japan and the US

Sharing of information is a prerequisite for joint operations, but at the moment it is not clear what information Japan and the US are to share. Military information can be divided into "data or pre-analysis information" and "analyzed intelligence." The minimum level of required sharing between Japan and the US is data. Each side would analyze shared data and formulate its own intelligence. Depending on the contents there could be some data that is difficult to share, so what sort of military information, especially specific data, needs to be shared should be determined carefully in a manner emphasizing effective BMD operations, and without obstructing the national interests of either country.

We must not ignore the need to establish a common operational base on such matters as mapping data; as such data form the foundation for information sharing. This is because the US Informational Net Centric Concept is founded on a common operational base within US Forces.

3) Japan-US Joint Operations

a. Legislative Measures

For the smooth operation of BMD, Japan revised the Self-Defense Forces Law in 2006. Since BMD characteristically requires very short response times, the ballistic missile destruction measures are added to that Law as Item 2 to Article 82, delegated authority to SDF commanders on missile defense, as in the case of intercepting violations of territorial airspace.

This revision is a big step forward in Japan's national defense. Future issues will include preparation of unit operational details, such as how to prepare Emergency Response Procedures

under approval of the Prime Minister in association with the revised Self-Defense Forces Law,[4] how to prepare the operational manuals, especially the Rules of Engagement (ROE) to determine the level of delegated defense actions, whether to require approvals on such operational manuals, and how to set procedures to approving changes to ROE to response to ever-changing war conditions. Preparation of such response procedures will also require review and adjustment of Japan-US coordination procedures.

b. Coordination of Japan-US Joint Operations

Coordinated actions in joint operations will require not only static measures such as development of facilities, equipment, rules, and regulations, etc, but also building the dynamic aspects of BMD through training under more realistic conditions and verification of system effectiveness.

For coordination of joint BMD operations the Japan-US Joint Operation Coordination Center (BJOCC) will need the following functions. Firstly, as response to ballistic missile attacks is a national scale one regardless of how authority is delegated, there should be a communication network over the C2BMC operated by BJOCC to connect all relevant systems. That communication network aims to assist national decision-making by connecting C2BMC with the Prime Minister's Office, as well as with the relevant systems of major Headquarters, national security organizations such as police and firefighters, local communities, and other public organizations. Secondly, for BMD operations BJOCC will provide joint command and control as well as coordination functions, because operations will require not only coordination between Japan and the US but also joint SDF operations. Thirdly, BJOCC should aggregate relevant BMD information including that obtained from satellites owned by Japan and the US, and immediately convey any commands and information to interception units. Lastly, BJOCC shall ensure the integrity and required facility redundancy.

Implementing such functions requires the development of C2BMC that can provide effective coordination between Japan and the US. For this, it is necessary to determine a C2BMC system as soon as possible and adjust the concept of its acquisition to the possibility of Japan-US joint development.

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[4] "Emergency Response Manual" is to be prepared by the Director General of the Defense Agency and approved by the Prime Minister. This is to state procedures to prevent damage to human lives and assets within Japanese territory in emergency situations such as ballistic missile attacks, where the situation changes too rapidly to seek the approval from the Prime Minister. The Manual allows the Director-General of the Defense Agency to issue necessary commands to destroy ballistic missiles within a pre-designated time period to each unit. Any necessary items required for the preparation of the Emergency Response Manual are defined under Government Ordinances.

It is also essential to determine how to proceed with coordination. Japan and the US each needs to prepare ROEs in advance and coordinate the timing of their application. Such coordination will not be easy. There may be significant differences between Japan and the US in the scale of authority delegated to the unit commanders, so it is important to undertake coordination domestically as well as with the US.

Items for coordination may include actual operational plans, operational airspace, applicable ROEs and the timing of their exercise. As the level of coordination required for these items may differ depending on the subject, it is necessary to distinguish coordination between national and theater levels. It will also be essential to develop a Common Operational Picture (COP). The major issue is which side should prepare and control this COP, Japan or the US.

Chapter 7 Development of C2BMC

1. Items to Consider in the Development of C2BMC

1) Japan's Geopolitical Characteristics

The geopolitical characteristic facing Japan's defense is that of a narrow width of land giving less depth for response to threats. Missiles launched from neighboring countries can reach Japanese territory in a very short time, giving only about 10 minutes response time against ballistic missile attacks. For proper response to such attacks it is essential to have: ① strengthened sea-borne capabilities; ② fully prepared defense plans; ③ proper information collecting activities and warning processes; ④ C2BMC that enables real-time information processing; and ⑤ establishment of various operational manuals including Rules of Engagement (ROE) and the development of training and exercises.

Especially in terms of C2BMC development, the system must satisfy extremely advanced performance requirements simultaneously, such as the minimization of human errors, extreme care in view of political sensitivity, and decisiveness in military operation — all under a time-pressured tense operating environment with a large-scale multi-layered command and control structure involving decision-making from national to theater levels.

Japan's geographical situation makes it dependent on sea lines of communication. The BMD system Japan started to develop would mainly intercept ground-based ballistic missiles flying in from the Eurasian continent, but Japan also may need capability against ship-launched ballistic missiles from submarines (and even container ships operated by international terrorist groups), as well as anti-ship ballistic missiles launched from land or sea. This will require the development of C2BMC accommodating such capabilities. Japan may need to consider the possible emergence of ballistic missiles armed with non-conventional warheads, including the High-Powered Microwave Device (HPMD) said to be under development in China.

2) Technological Level

For effective operation of Japan's BMD, it is essential to develop C2BMC thoroughly interoperable with C2BMC of the US. Since major technologies concerning C2BMC are held by the US; for example, regarding real-time processing of information on incoming ballistic missiles, discrimination of such missiles, and highly advanced kill assessment technology, the problem is how to make it enable the transfer of such technologies to Japan and secure release of critical data.

It is not yet known whether the US Government will cooperate in the release of data and transfer

of technologies needed for the development of Japan's C2BMC. It may not be easy, and will require close bilateral consultation. As the current situation of C2BMC development in Japan is that Japanese companies are working with the support of US companies, these US companies may demand the provision of technologies owned by Japanese companies in return. How Japanese government and domestic companies will respond to such demand involves fairly difficult problems. Nevertheless, the advancement of Japan's BMD activities will undoubtedly lead to further strengthening of Japan-US relations. Therefore, it is a difficult but critical challenge to build a framework of truly complementary relationships between the governments and industries of Japan and the US, while further developing the foundation of Japan's national defense to the level suitable for such a closer relationship.

3) Subjects of Operations

To defend from ballistic missiles threats, Japan is building BMD weapons and sensors operated under C2BMC. However, current budget constraints have limited the variety and numbers of such systems (Aegis ships, Patriot PAC-3 units, types of sensors, and quantities of missile launchers as well as missiles themselves). Such restriction may not present serious problems to the scale of the C2BMC system or required performances of weapons, sensors and communication networks, but future development of C2BMC could pose serious problems unless there is careful consideration of future weapon and sensor acquisition by Japan, how the US will deploy forces to Japan, and what weapons and sensors – in quantities and qualities – the US will position in Japan. Therefore, it is important that the plan to build C2BMC capability is clearly defined phase by phase in response to expected growth in such weapons and sensors.

2. Direction and Issues of C2BMC Development

1) Basic Concept

The development of C2BMC should be based on the following concepts.

① BMD system aims to protect the lives and assets of Japanese people, and to defend Japan from ballistic missile attacks, so operational initiative should lie with Japan.

② As it is difficult in terms of both technology and funding for Japan to be self sufficient in BMD, Japan needs to rely to some extent on the US. On the other hand, the US is well on its way to steadily developing BMD capability to cover its homeland as well as the entire Far East region. Therefore, both Japan and the US need to clarify the mutual relationship of their BMD systems, while confirming their concepts on how to cooperate in BMD operations.

③ Japan's operational region for BMD is different from that of the US, while being almost equivalent with Japan's operational region for air defense. So it is inefficient both technologically and financially to establish independent C2BMC systems as has the US. Thus, as MOD(former

JDA) is doing now, it is better to add BMD its existing air defense system.

④ Japan is currently undertaking the development of C2BMC by adding BMD functions to the existing JADGE system, yet, development efforts are likely to remain at a level of partial upgrades comparing to the sufficient level to make C2BMC functions more effective joint operational coordination. In the future, C2BMC functions should be further strengthened, including linkage to various systems owned by the Prime Minister's Office, and each Self-Defense Force. Moreover, to smoothly execute such measures as missile launch alarms, and confinement of impact damage, it is necessary to review linkages to systems such as those of other national organizations, municipal governments, and public organizations.

⑤ Since Japan's BMD response time is extremely short, there must be joint Japan-US response from national to theater-level, as well as information sharing at every level. In order to conduct joint BMD operations without policy failures or delays in operation, Rules of Engagement (ROE) at all levels should be determined in advance to define the delegation of authority required for each situation.

⑥ For BMD operations the Commander of the Joint Task Force (JTF) should use a single C2BMC system to exercise integrated command and control activities. To improve the efficiency of JTF command and control activities it is important to secure sufficient peacetime staff organization and support capabilities.

⑦ BMD communication networks should include coverage at each government level including Ministry of Defense (MOD), Self-Defense Forces/Joint Task Force, and theater units.

⑧ In its development of C2BMC for MD, the US seems to distinguish command and control functions from information functions. In case of the Japan, there has been some effort to develop an information collecting center, but it seems insufficient for development of C2BMC. For the moment, therefore, Japan needs to improve information collecting functions by strengthening links between US Forces information collecting community and various command, control and communication systems in Japan, including the Japanese C2BMC system.

2) Concrete Measures

a. Improvement of Japan-US Interoperability

To improve interoperability between Japan and the US, standardization of equipment will be needed as follows (in addition to the strengthening of confidentiality protection measures such as the General Security of Military Information Agreement (GSOMIA) discussed in Chapter 5).

The US concluded the NATO Standardization Agreement (STANAG) on the standardization of equipment, as well as standards for operational procedures, technological matters, and communication manuals on equipment used by the militaries of NATO members. The message

formats or protocols of LINK-11 or LINK-16 used by the SDF in Japan-US joint operation are standardized under this STANAG. However, Japan is not a member of the agreement that stipulates such standards. Therefore, if Japan is to operate such formats or protocols in its own environment, it may become necessary to modify the message formats, depending on the situation.

Usually, if such a need arises, a Format Control Committee of member countries will decide whether to accept a proposed change. Since Japan is not a member, it cannot participate in such activity. So Japan needs to make a proposal to the US; if the US recognizes the need for a change, then it submits a proposal to the Format Control Committee. However, with the prospect of many changes needed for message formats throughout the processes of development, maintenance, and management of C2BMC, Japan must find a way to directly participate in the Format Control Committee.

Upon the North Korean missile launches in July 2006, data communication within US Forces and between Japan and the US should have used the SAT-LINK16 or LINK-16. SAT-LINK16 would prioritize use by US Forces due to its limited capacity, and use by Japan could be restricted. Should there be any lesson learned from the incident of July 2006, it would be the need to develop a data communication system between Japan and the US free of any limitation in network capacity or delays in relays. Needless to say, the SDF should fully develop skills in data communication with US Forces; otherwise there would be no smooth communication and information exchange. To develop such skills, it will be necessary to implement more advanced drills, exercises, and training for Japan-US integrated operations.

b. Composition of Multi-Layer Information Networks

As discussed in the previous chapter, there should be three layers of information networks on top of the C2BMC to allow smooth coordination of joint operations at the BJOCC: ① a national network connecting the Prime Minister's office, relevant ministries and agencies, and the central command; ② a command network linking major headquarters of the Ground, Maritime, and Air Self-Defense Forces, and; ③ a extended system connecting these networks with relevant systems of police forces, fire-fighters and other national security organizations, local governments, and public organizations. In developing such a system, it will be important to ensure a strong resiliency that allows the networks to function even when damaged. There will also be a need to economize network building to maximize the use of existing systems.

c. Promoting the Development of C2BMC

The project of adding BMD functions to the JADGE system is intended to link Aegis ships and

PAC-3 with the JADGE at the center, but in near future it is planned to integrate new sensors such as Japan's FPS-XX radar into JADGE, and to link with information from US early warning satellites and ground-based radar networks, further developing monitoring capability. The possibility of network building between Japan and the US using LINK16,[1] STADIL-J (Satellite Tactical Digital Information Link-J) [2] or JREAP (Joint Range Extension Application Protocol) [3] is under review.

However, the development of such systems is limited to "Defense Capability" (active defense) in terms of destroying incoming ballistic missiles, and not only provides no "Denial Power" (offensive defense) to attack missile launching bases, but also offers extremely limited "Damage Confinement" (passive defense) capability to respond to missile impact. Therefore, in the future, Japan needs to develop C2BMC that can support a broader concept of command and control in ballistic missile defense, including such "Denial Power" and "Damage Confinement."

For this purpose, it is necessary to implement the aforementioned: ① enhanced linkage with national level command and control including the Prime Minister's office system and the central command systems of the Ministry of Defense; ② reinforcement of command and control systems each Self-Defense Force uses for its operations; ③ linkage and integration with an extended network connecting to police forces, fire-fighters and other national security organizations, local governments, and public organizations; ④ linkage of information systems operated by the Defense Intelligence Headquarters, the central MOD intelligence organization and; ⑤ the linkage and integration of various information systems including US Force's GCCS (Global Command and Control System), ground-based US radar (X-Band Radar), Aegis ships of the US Navy, and PAC-3s deployed to Japan. In developing such a system, it will be a challenge to incorporate the US spiral approach to successively build capability with the Japanese method of planning and budget allocation. Utilizing lessons learned from the North Korean missile launches, coordination needed to establish requirements for joint operations and project management can be made easier through continued implementation of systems integration and network building between Japan and the US.

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[1] Tacticical Data Link System for mobile units. In the US and Europe, it is used for joint information sharing, classification and identification, and navigation of Army, Navy and Airforce, as JTIDS (Joint Tactical Information Distribution System) and MIDS (Multifunctional Information Distribution System).

[2] A method to implement real-time communiation using satellites through the use of a LINK-16 message format. By using satellites, it will not only extend the communication range, but also allow real-time communication by adjusting the delay in communication time.

[3] A Protocol used for JRE (Joint Range Extension). JRE is a method to link multiple number of tactical data link networks using satellite communication, and extend the range of data exchange.

3) Required Functions for Japan

The following list shows the minimum functions Japan requires for C2BMC:

① **BMD planning**

- Assessing and distributing information from such sources as the Defense Intelligence Headquarters.
- Preparing and verifying BMD planning for each of MOD level, and Joint Task Force level.
- Preparing, coordinating and maintaining the most appropriate joint deployment plan of US and Japanese forces for BMD in the region surrounding Japan.
- Simulating a series of BMD activities needed to prepare and verify combat plans, as well as maintain and update information used for BMD.
- Enabling flexible modification to overall BMD configuration in response to changes in combat areas.

② **Command & Control (C2)**

- Immediately conveying commands and instructions from the Defense Minister to the Joint Task Force commander, and ensuring the dissemination of such information to relevant units
- Enabling the Joint Task Force commander to immediately convey orders to constituent units, while communicating with other relevant units (command and control of battle management method can be either centralized or decentralized). In addition, communicating with the Prime Minister's office and relevant ministries and agencies on the combat situation.
- Immediately providing information collected and analyzed at the Defense Intelligence Headquarters to Joint Task Forces.

③ **Warning**

- Reporting timely to senior commanders, and communicating with relevant units upon receiving missile launch warnings from relevant organizations as well as US Forces
- Quickly recognizing indications of ballistic missile launches, so to raise alert conditions[4]
- Controlling unified sensors
- Distinguishing actual targets from decoys of incoming missiles, detecting and tracking the missiles, and identifying the locations of debris from intercepts.
- Predicting impact locations as accurately as possible to ensure preparation before impact and confine damage afterward; communicating such information to relevant organizations and units.
- Preparing COP (Common Operational Picture) and present it to relevant units

④ **Interception of incoming ballistic missiles**

- Quickly ordering an engagement plan and applicable ROE, based on orders from superior

[4] Separate systems are to operate the interception of missiles by joint task force, divided into several stages depending on the urgency of ballistic missile attacks on Japan.

commander(s) upon engagement and analysis of threats

- Allocating the most appropriate weapons and ordering their firing, based upon threat analysis, the status of usable weapons, the number of remaining weapons, and priorities for the protection of facilities
- Monitoring the engagement situation, overriding the previous commands by canceling engagements, or ordering the self-destruction of launched weapons; confirming the results of engagements, and reporting them to superior commanders and other relevant units

⑤ Disabling enemy missiles by methods other than interception

- Implementing soft-kill operations at the missile launch sites, using un-manned aerial vehicles (UAV) and aircraft
- Disabling an enemy's command and control systems by electronic countermeasures or cyber attacks

⑥ Communication related to BMD

- Controlling unified communication networks related to BMD
- Developing and maintaining communication manuals related to BMD
- Effectively integrating various missile defense functions with US Forces

⑦ Maintaining and improving system capabilities

- Simulating a series of system functions
- Monitoring missile interception tests and analyzing the results

⑧ Support of training and exercises related to BMD

- Supporting training using simulation, as it is difficult to use actual targets in BMD training

⑨ Ensuring systems reliability

- Protecting from, and conducting countermeasures against cyber attacks, the biggest threat to systems and networks
- Ensuring the credibility of information and data obtained from systems and networks

3. Future Tasks

1) Coordination of Japan-US Joint Operations at Yokota Air Base

Currently, the development of C2BMC in Japan is focused on adding BMD functions to the JADGE that operates mainly at the Air Operation Control Center (AOCC) at Fuchu Base. Therefore, when the project is completed, the Commander of ASDF Air Defense Command, designated as the Commander of the Joint BMD Task Force, will execute command and control of BMD, along with air defense operations at Fuchu.

However, when BJOCC is established at Yokota Base, air defense operations should be transferred there. It is not clear when this transfer will occur, but this factor should be fully incorporated into

the development of C2BMC. It is also necessary to review procedures for establishing the Air Defense Command Headquarters next to the command post of the US Forces, and consider the most appropriate way to exchange information, thereby ensuring full coordination and harmonization with changing US C2 systems. Depending on the situation, a phase by phase approach, such as firstly working on systems related to BMD and then systems related to other defense operations, may facilitate smoother development of systems.

2) Relationship between Information Functions and C2BMC

As a part of developing a joint operations structure, MOD is to reorganize the Defense Intelligence Headquarters as organization directly reporting to the Defense Ministry. To do so, it is necessary to consider how to provide early warning information and US Forces' information on BMD, which are likely to require extremely urgent response, to the Joint BMD Task Commander. Also, there is an urgent need to review the methods, tools, and procedures of information exchange between the Defense Intelligence Headquarters and Joint BMD Task Force.

3) Project Management System at the MOD

The development of a BMD system and C2BMC will implemented phase by phase. Thus it is necessary to designate a position at the Joint Staff Office or Internal Bureau of the MOD with sole responsibility for the operation of such systems, as in the case of the Program Executive Officer (PEO) in the US, so to implement an integrated management of projects through securing budgets, understanding project status, and exercising necessary control. This position should be supported by an organization to manage projects, coordinate efforts with US counterparts, and control procurement from private contractors. Authority to request and manage budgets should be delegated to the Joint Staff Office. For the moment, it is possible to designate a specific Self-Defense Force (Chief of Staff Office) as in the case of the US, establish an organization for project management, implement this project for future integration, and establish a system so that all Self-Defense Forces can support such an organization.

On the other hand, US Forces are currently promoting information exchange with multi-national forces, by starting an Advanced Concept of Technology Demonstration (ACTD) project for each stage of Command and Control (C2) and Intelligence, Surveillance, and Reconnaissance (ISR), and designating an Integrated Product Team (IPT) of private and public sector participants to determine requirements and capabilities. This is a method highly popular in the US for some years as a way of quickly providing capabilities sought by operators. The status of the ACTD on C2BMC is unclear, but ACTDs have already been adopted for conventional arms and counter-terrorist measures.

When developing C2BMC in Japan, it is necessary to have close coordination with the US in determining requirements for information exchange. Due to different languages and cultures, such coordination may take a long time. Moreover, there are problems of differences in technologies and of releasability of information. To reduce risks associated with such problems and obtain agreement in a short period it is time to consider establishing IPTs drawn from the private and public sectors.

4) Establishment of Infrastructure for Communication Networks

It is no exaggeration to describe the establishment of a quick and certain communication network as the very core of C2BMC for BMD operations characterized by their critical nature and need for immediate response. As described already, the BMD in Japan requires the establishment of a communication network that conforms to each response level, and consists of multi-layered networks connecting national government agencies, relevant SDF headquarters and combat units, and US counterparts. Such communication networks obviously require superior characteristics not only in terms of performance but also in confidentiality and resilience. Information networks between Japan and the US, especially those connecting US Navy Aegis ships, US Army-operated X-band radar and PAC-3 units, and Air and Maritime Self-Defense Force units, require agreements, procedures, and manuals related to information exchange, as well as joint trainings and exercises that utilize lessons learned from the North Korean missile launches of July 2006. In addition, we must consider the effective utilization of the US Forces' communication infrastructure as the need for joint operations increases.

5) Establishment of a System to Assess Capability

Japan's BMD systems are gradually developing, but Japan does not have an appropriate system to guarantee their quality, assess the capability of an overall system, identify items that need to be acquired, and use such information to develop new projects for such acquisitions. Especially in the case of Japan, restrictions on areas allowed for test launches make it extremely difficult to conduct tests using ballistic missiles to assess BMD systems capabilities. Therefore, there is no choice but to rely on simulators to assess BMD systems. At present, Japan's capability to simulate hostile ballistic missiles, present simulation information to C2BMC, and assess C2BMC's response is extremely limited.

The ASDF is developing simulation functions as a tool of JADGE assessment. This function is expected to develop into a laboratory for BMD research and development, equivalent of JNIC of

the US.[5] In the transition, we should consider developing a capability to classify and store data and parameters obtained from missile launch tests.

It will be important to review the development of modeling and simulation (M&S) function for ballistic missiles, and obtain a capability to monitor launch tests in order to collect data on SM-3 and PAC-3 operations.

[5] JNIC (Joint National Integration Center): A research facility under the US Missile Defense Agency locatd at the Shriver Air Base in Colorado. The Center develops, and assesses systems and equipment related to missile defense using the cutting edge of technologies, and develops doctorine for joint missile defense, support for preparing operational plans, and simulations on various operations.

Part 3 Comprehensive Measures for Responding to Missile Attacks

Chapter 8 Japan's Participation in Arms Control, Disarmament and Non-Proliferation

1. Purposes and Significance of Arms Control, Disarmament and Non-Proliferation

BMD is not the only method to reduce the threat of ballistic missiles. There are other military as well as non-military measures. Typical non-military methods include arms control, disarmament, and non-proliferation, which are defined as follows:[1]

- Arms control involves the control of armaments and military equipment by setting upper and lower limits, verifying and inspecting compliance with such restrictions, developing mutual trust, and restricting the transfer of conventional weapons.
- Disarmament aims for the reduction or overall elimination of armaments and military equipment.
- Non-proliferation is prevention and control of the proliferation of armaments in general, especially weapons of mass destruction (WMD) such as nuclear, biological, and chemical weapons, delivery means such as missiles, and related materials and technologies.

Each country has the sovereign right to possess armaments needed for its security. However, if country A reinforces its military capabilities, and country B doubts A's intentions, then country B may start to reinforce its own military capabilities. If country B's reinforcement encourages country A to doubt the intentions of country B, then country A may have motive to further develop its armed forces. As seen here, the military build-up of one country may result in a security dilemma where the strengthening of one country's security may invite anxiety in other countries, resulting in other countries reinforcing their security to mitigate such anxiety. In the end, efforts to strengthen security may result in the instability of bilateral relationships.[2] For countries in a security dilemma, not only is the possibility for armed conflicts even greater than before the strengthening of armed forces, but also there is concern that the scale of confrontation and damage may become larger. Moreover, the costs to develop such armed forces are likely much higher than originally anticipated.

Arms control, disarmament, and non-proliferation are approaches whereby countries agree

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[1] Disarmament, Non-Proliferation and Science Department, Ministry of Foreign Affairs (ed.), *Japan's* Disarmament *and Non-Proliferation Policy* (3rd edition), Ministry of Foreign Affairs of Japan, 2006, p. 6 (in Japanese) .

[2] Jitsuo Tsuchiyama, *International Politics of Security: Impatience and Conceit* (Tokyo: Yuuhikaku, 2004), p. 109 (in Japanese) .

unilaterally, bilaterally, or multilaterally to implement qualitative or quantitative limitations on the possession of armed forces or to adopt measures to restrict the actual operation of armed forces. The implementation of such measures is expected to prevent security dilemmas to maintain stability in the security environment, and to mutually strengthen the security of each country without relying just on armed forces. This would also provide the benefit of capping military expenditures that accompany arms build-ups. In addition, arms control, disarmament, and non-proliferation negotiations may work as channels of communication between hostile countries, as exemplified in the nuclear arms control negotiations conducted between the US and the Soviet Union during the Cold War.

On the other hand, countries have tried to exploit frameworks for arms control, disarmament, and non-proliferation to create a more favorable situation for their own side. To agree on arms control, disarmament, and non-proliferation, each party had to undergo hard negotiations concerning each word of the agreement texts because there were conflicts of national interests. Those agreements on arms control, disarmament, and non-proliferation were sometimes made only when there was no longer any confrontation between the parties, or because changes in the security environment and/or technological innovation eliminated or diminished the need to regulate arms. This is what is called the "paradox of arms control and disarmament."

Certainly, one cannot deny that the frameworks for arms control, disarmament, and non-proliferation have had important roles in securing stability. Yet, one must also remember that such frameworks are also used as strategic tools by many countries.

2. Arms Control, Disarmament, and Non-Proliferation Policies

Arms control, disarmament, and non-proliferation developed rapidly after World War II when nuclear weapons emerged and major powers started to build nuclear arsenals. Ever since then, the issue of ballistic missile defense has had a strong influence over trends in arms control, disarmament, and non-proliferation.

1) The Cold War Period: Arms Control and Missile Defense between the US and USSR

a. Establishment of ABM Treaty and Nuclear Arms Control

After the end of World War II, the US and the Soviet Union entered into the Cold War, the history of which was strongly influenced by the nuclear weapons possessed by both countries. The US and the Soviet Union were in fierce competition over the build-up of strategic nuclear forces, including Inter-continental Ballistic Missiles (ICBM), Submarine Launched Ballistic Missiles (SLBM), and heavy bombers, as these allowed direct attacks on the other's homeland. They also

engaged in an arms race in non-strategic nuclear weapons as well.

At first, the US had supremacy in nuclear forces, but the Soviet Union rapidly narrowed this gap from the launch of Sputnik in 1957 and the build-up of nuclear forces that followed. In addition, the Soviet Union actively promoted the development of Anti-Ballistic Missile (ABM) systems to intercept US strategic nuclear weapons. In response, the US proposed a freeze on the expansion of strategic weapons after 1964. The Soviet Union rejected this proposal for fear of locking in its inferiority against the US in strategic nuclear forces.

The Soviet Union, however, changed its policy and accepted the US proposal to negotiate over arms control in 1968. Underlying this policy change was the fact that the US and the Soviet Union had almost reached parity in their strategic nuclear forces, in addition to the fact that the US announced a decision to deploy the Sentinel ABM system in 1967. This was the moment that the nuclear arms race between the two countries actually let them recognize the need for arms control, and they started the first round of Strategic Arms Limitation Talks (SALT) in 1969.

During the SALT I negotiations, the US proposed prioritizing limitations on ABM development, arguing the need to maintain a situation of Mutual Assured Destruction (MAD). Although opposed to such arguments at first, the Soviet Union eventually agreed to prioritize ABM limits. In the US, the Safeguard ABM system was firstly intended to defend the US from Soviet ICBM attacks, but later the US emphasized its significance as a major item in the SALT negotiations.[3]

Both countries signed the ABM Treaty in March 1972, and the Treaty entered into force in October of that year. It set strict limits on ABM activities. The deployment of ABM systems was prohibited except at two sites in each country: the capital city and ICBM launch silos (both countries agreed to reduce the number of sites where ABM systems could be deployed from two to one under the ABM Treaty Protocol agreed in July 1974). At each ABM base, the number of ABM launchers and missiles could not exceed 100. The ABM Treaty also limited the qualitative build-up of systems by prohibiting the development, test, or deployment of ABM systems or their components on sea, air, space, or mobile ground platforms. To ensure the implementation of the ABM Treaty, it was determined that either country could freely conduct inspection and verification using "national technical means," and that neither party could interfere with such inspections.

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[3] Tetsuya Umemoto, "Development of National Missile Defense," Satoshi Morimoto (ed.), *Missile Defense: The New Structure of International Security* (Tokyo: Japan Institute of International Affairs, 2002), p. 37 (in Japanese).

The ABM Treaty can be considered to have institutionalized the MAD situation in terms of letting the US and the Soviet Union accept their vulnerability to strategic nuclear missile attacks from each other. At the time of the ABM Treaty, the mainstream concept in the US was that MAD would benefit the strategic stability between the US and the Soviet Union as each side saw each other as a mirror image. Therefore, the ABM Treaty was called the cornerstone of strategic stability.

Moreover, the ABM Treaty was seen as a foundation of arms control between the US and the Soviet Union on strategic nuclear weapons, as it would lessen the motivation for either country to increase its strategic nuclear weapons to overwhelm the other's defensive weapons. The US and the Soviet Union also signed the SALT I Interim Agreement at the same time as the ABM Treaty. Here, both countries agreed to freeze the total number of ICBM launchers, SLBM launchers, and new types of submarines with ballistic missile capability (SSBN). Also, the additional manufacturing of ICBM launchers was frozen, and caps were set on the deployment of SLBM launchers and SSBNs. While the SALT I Interim Agreement was valid for only 5 years, it was historic in that the US and the Soviet Union agreed to limit the nuclear arms race for the first time.

In November 1979, both countries signed the SALT II Treaty. The SALT II Treaty set the total number of ICBM launchers, SLBM launchers and Air-to-Surface Ballistic Missiles (ASBM) at 2250, to be achieved by the end of 1981. It also included a limit on the introduction of Multiple Independently Targeted Reentry Vehicles (MIRV) for ballistic missiles. However, there was criticism in the US over a perceived "window of vulnerability,"[4] in which implementing the SALT II Treaty would weaken the US vis-à-vis the Soviet Union in terms of strategic nuclear capabilities. The Soviet invasion of Afghanistan in December 1979 led the US to recognize the fact that nuclear parity would not deter Soviet expansion. The Carter Administration could not get Congress to ratify the treaty, while the Reagan Administration opposed its ratification. In the end, the SALT II Treaty expired at the end of 1985 without entering into force.

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[4] The "window of vulnerability" reflected the criticism that the SALT II Treaty restrained the US from adding prompt hard-target kill capability to its ICBM forces that could effectively strike, while allowing Soviet supremacy on the number of nuclear warheads and load weights on ICBMs, as well as prompt hard-target kill capability. Soviet SS-18 ICBMs deployed by the end of 1970s were MIRVs with 8 to 10 nuclear warheads on each missile. They had higher precision and prompt hard-target kill capability. It was thought that preemptive attacks using these missiles could destroy US ICBMs with hard-target kill capability. If the US then used SLBMs and heavy bombers to retaliate, then the Soviet Union was expected to counterattack high value targets in the US. So in fear of that, the US could not retaliate. In other words, US deterrence capability against the Soviet Union would collapse. See, for example, George H. Quester, "Relating Nuclear Weapons to American Power," Stephen J. Cimbala (ed.), *Deterrence and Nuclear Proliferation in the Twenty-First Century* (Westport, Connecticut: Praeger, 2001), pp. 15-16.

2) SDI and the ABM Treaty

The Strategic Defense Initiative (SDI) launched by the Reagan Administration led to intense debate not only between the US and the Soviet Union but also within the US. One problem was its relationship to the ABM Treaty. Space-based interception was central to the SDI but the ABM Treaty prohibited any ABM development and deployment other than fixed ground-based systems. In regard to this, the US government adopted in October 1985 an interpretation that the ABM Treaty would not prohibit the development and testing of ABM systems based on other physical principles that had not been assumed at the time the ABM Treaty was signed, such as laser weapons.

This new and broader interpretation was strongly criticized not only by the Soviet Union but also by SDI opposition groups within the US. The Reagan Administration supported such a "broader interpretation," but the Congress attempted to block it by adding conditions to SDI funding that no ABM systems based at sea, in the air, in space, or on mobile ground launchers could be developed, tested or deployed, regardless of the physical principles adopted. While the administration of George H. W. Bush maintained the "broader interpretation," the Clinton Administration dropped it in light of the considerable decline in the former Soviet threat.

3) The Implications of SDI for Nuclear Arms Control Negotiation

In his speech of November 1981, President Reagan proposed the Strategic Arms Reduction Talks (START) between the US and the Soviet Union, arguing a need to radically reduce the number of strategic nuclear weapons in an equal and verifiable way rather than to limit their number, which had resulted in a unilateral nuclear forces expansion by the Soviet Union. President Reagan added that the US would be ready to withdraw from its plan to deploy Pershing II IRBMs and Ground-Launched Cruise Missiles (GLCM) to Europe, if the Soviet Union would remove its Intermediate-Range Ballistic Missiles (IRBM) such as SS-20, SS-4, and SS-5 deployed in the Soviet homeland and adjoining European region.[5]

The US and the Soviet Union began negotiations on START and Intermediate Nuclear Force (INF) agreements, but progress was largely dependent on SDI. Gravely concerned by US promotion of SDI, the Soviet Union argued for linkage between SDI and nuclear arms control; limitation on SDI development would be the condition for promoting nuclear arms control. The US rejected this linkage and did not change its approach to SDI. Moreover, the US decided to increase its

[5] Ronald Reagan, "Remarks to Members of the National Press Club on Arms Reduction and Nuclear Weapons," Washington D.C., November 18, 1981 [http://www.reagan.utexas.edu/resource/speeches/1981/111881a.htm].

strategic nuclear forces and started to deploy GLCM in Europe, based on a decision by the North Atlantic Treaty Organization (NATO) [6] in 1979.

Faced with this situation, General Secretary Mikhail Gorbachev steered the Soviet Union toward pursuing nuclear arms control negotiations. His move was undoubtedly influenced by strong concern over SDI. No one can deny the fact that SDI delayed progress on nuclear arms control negotiations due to the Soviet Union's argument for linkage. However, it is also true that SDI brought the Soviet Union to the negotiating table. If SDI became a reality, then it would be easy to predict that the Soviet Union would be forced to increase its strategic nuclear forces to maintain the balance with the US. Expansion of the US INF and strategic nuclear forces would also force the Soviet Union to bear a greater burden. Since its economic situation was already in serious deterioration, the Soviet Union did not have sufficient capability to engage in an arms race with the US. The Soviet Union had a strong motivation to avoid defeat in the nuclear arms race with the US by establishing a nuclear arms control treaty.

That is why General Secretary Gorbachev proposed in February 1987 to proceed with INF negotiations which, aside from SDI, had become an immediate concern for Soviet security. The US and the Soviet Union agreed to a "Double Zero," eliminating their mid-range (1000-5500 km) and short-range (500-1000 km) missiles from Europe, and later to a "Global Double Zero" to eliminate all of their mid- and short-range missiles worldwide.

The INF Treaty was signed in December 1987 and entered into force in June 1988. It stipulated that both countries were to eliminate ground-based mid-and short-range missile systems (including missiles, launchers, related structures and support equipment) under strict verification measures, including on-site inspections. Both countries complied with the Treaty and even today do not possess such missiles.

Concerning the reduction of strategic nuclear weapons, both countries were able to agree on many issues, including measures to be incorporated in a treaty. However, continued Soviet insistence on linkage with SDI prevented conclusion of a treaty during the Reagan Administration. The Soviet Union finally abandoned the idea of linkage with SDI in September 1989, after the inauguration of the George H. W. Bush Administration. The Strategic Arms Reduction Treaty I (START I) was signed in July 1991. The START I Treaty stipulates reduction of the total number

[6] This decision concerned the deployment to Western Europe of US IRBM (Pershing II, 108 missiles) and GLCM (464 missiles) capable of reaching the Soviet homeland, in exchange of promoting US-Soviet negotiation of theater nuclear forces in Europe.

of strategic nuclear delivery vehicles, such as ICBMs, SLBMs, and heavy bombers deployed by both countries to less than 1600 within seven years after the Treaty's entry into force, with the number of heavy ICBMs to be reduced to less than 154, and strategic nuclear warheads to less than 6000. Dismantlement of delivery vehicles was to be conducted under strict verification. The START I Treaty was truly epoch-making as the first treaty that stipulates the reduction of strategic nuclear weapons possessed by the US and the Soviet Union. At the same time, the Treaty was valued as beneficial to the strengthening of strategic stability between the two countries through its significant reduction of heavy ICBMs with MIRVs, seen as having great potential for preemptive attacks.

After the signing of START I, and reflecting growing concern over Soviet control of its nuclear weapons, President Bush announced in September 1991 unilateral measures to remove tactical and theater nuclear weapons (hereinafter referred to as non-strategic nuclear weapons) except those on bombers and attack aircraft, and requested the Soviet Union to take similar measures. President Gorbachev followed the US move by announcing similar disarmament measures in October 1991. After the dissolution of the Soviet Union in December 1991, the Bush Administration announced in January 1992 the end of further production of B-2 bombers, the halt of smaller ICBM development and new ICBM production, the discontinuation of nuclear warhead production for SLBMs, and the ending of a program for new types of cruise missiles. Soon after this announcement, Russian President Boris Yeltsin requested that the Russian Parliament ratify the START I Treaty, and promised to implement reduction measures before its entry into force, as well as a series of unilateral nuclear disarmament measures related to strategic nuclear weapons. The strategic nuclear weapons of the former Soviet Union were deployed in Belarus, Kazakhstan, and Ukraine in addition to Russia. These countries and the US signed the START I Treaty Protocol (Lisbon Protocol) on May 23, 1992, and agreed to have all these countries as parties to the START I Treaty; Belarus, Kazakhstan and Ukraine would also join the NPT as non-nuclear weapons states. The Treaty and its Protocol entered into force in December 1994. The three former Soviet countries other than Russia removed all nuclear weapons from their territories and transferred them to Russia.

2. Changing Situation after the Cold War

1) Response toward the Issue of WMD proliferation

After the Cold War, there was growing concern that the proliferation of WMD and missiles to Third World countries could threaten the peace and stability of the international community. There had been efforts to prevent proliferation of nuclear weapons since the time of the Cold War under the nuclear non-proliferation regime, whose core is the Nuclear Non-Proliferation Treaty

(NPT) that entered into force in March 1970. However, the revelation of clandestine nuclear programs undertaken by Iraq and North Korea immediately following the end of the Cold War led the international community to further strengthen the nuclear non-proliferation regime, resulting in a series of measures such as reinforcement of the guidelines for the Nuclear Suppliers Group (NSG) in 1992, indefinite extension of the NPT in May 1995, establishment of the Comprehensive Nuclear-Test-Ban Treaty (CTBT) in September 1996, and establishment of the Additional Protocol to the International Atomic Energy Agency (IAEA) Safeguards Agreement in May 1997.

The international community also sought to enhance non-proliferation measures for WMD other than nuclear weapons. The Chemical Weapons Convention (CWC), established in January 1993, prohibits the development, manufacture, acquisition, transfer, and use of chemical weapons under strict verifying measures, and stipulates the dismantlement of existing chemical weapons as well as production facilities. The Biological Weapons Convention (BWC), which entered into force in March 1975, does not have verification measures. Negotiations for establishing a verification protocol failed in the summer of 2001 due to opposition by the US, but discussions on how to strengthen the BWC were conducted. The Australia Group is an international export control regime on biological and chemical weapons.

For missiles that can serve as delivery vehicles for WMD, export control has been implemented through the Missile Technology Control Regime (MTCR) launched in April 1987. At first, the MTCR aimed to control the export of delivery vehicles for nuclear weapons but, since July 1992, it has covered the export of missiles that can carry WMD, including biological and chemical weapons, as well as related dual-use items and technologies. As of the end of 2005, 34 countries were participating in the MTCR. Among Category I items, the most strictly controlled, are systems carrying WMD with capabilities exceeding a 300km/500kg range/payload threshold, and sub-systems such as rocket stages, re-entry vehicles, rocket engines, guidance systems and warhead mechanisms.

Whether Third World countries (including rogue states) can develop or acquire missiles largely depends on whether they can get support from foreign suppliers. In this sense, the MTCR has some effect in controlling the proliferation of missiles. However, it is difficult to fully prevent proliferation by the MTCR alone. Equipment, materials, and technologies related to missiles have already proliferated, and non-MTCR countries such as North Korea and China continue to export them. Moreover, the guidelines and lists agreed to under international export control regimes, including the MTCR, are not legally binding, and have no penalties for violation.

The WMD non-proliferation regime has certainly been strengthened since the end of the Cold War. However, relying solely on diplomatic measures may not be sufficient.[7]

The reasons that countries seek WMD and missiles are to enhance their deterrent and/or war-fighting capability, achieve goals such as regional hegemony, or respond to domestic political situations. It is necessary to remove such motivations by having them relinquish WMD, but this is extremely difficult to do so. If rogue states are strongly determined to acquire WMD or missiles, they may not join a treaty that prohibits such action, or may violate it. Although Iraq and North Korea were parties to the NPT, both countries secretly carried out nuclear weapons development programs.

Once these countries have WMD and missiles, it would be difficult to force them to abandon such weapons. In the case of Iraq, UN Security Council Resolution 687 (3 April 1991), adopted immediately after the Gulf War, stipulated that Iraq abandon its WMD as well as certain missiles. Such resolutions against other rogue states are not likely to be adopted in peacetime. Further, Iraqi interference with inspections by the United Nations Special Commission (UNSCOM) prevented successful implementation of the resolution.

Of course, the importance of diplomatic measures should not be undervalued. The establishment of non-proliferation regimes made possible the acceptance of non-proliferation of WMD and missiles as the global norm. Today, most countries in the world comply with the treaties and the arrangements related to non-proliferation. Still, as noted above, relying just on diplomatic measures are not sufficient to address proliferation issues. Proliferation is already a fact, and further proliferation will occur. Weapons and missiles already proliferated may be used in regional conflicts. That is why it is necessary to have missile defense to deter the use of missiles, and defend against those used.

2) START and the Agreement on the Demarcation Agreements of the ABM Treaty

Before the START I Treaty entered into force in January 1993, the US and Russia signed the Strategic Arms Reduction Treaty II (START II). This Treaty stipulated the reduction of strategic nuclear warheads to a range of 3000-3500 km by January 1, 2003, and totally eliminated MIRVed ICBMs. The latter point in particular was highly valued as promoting strategic stability between the US and Russia.

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[7] See Kathleen Bailey, "Missile Defense and Nonproliferation," *Comparative Strategy*, Vol. 12, No. 1 (1993), pp. 15-22.

Although the US ratified the START II in January 1996, Russian ratification was delayed because of its concern that if MIRVed ICBMs, Russia's major strategic nuclear force, were totally eliminated, Russia might have difficulty maintaining even the START II Treaty level of strategic nuclear forces. Given a deteriorating economic situation, sooner or later Russia might not be able to keep even a quantitative balance in strategic nuclear forces. In addition, Russia was concerned that it would become extremely vulnerable to any preemptive attack from the US, if the US became capable of intercepting Russian strategic nuclear weapons through its missile defense systems.

To mitigate Russian concerns, the US and Russia agreed on the Joint Statements on the ABM Treaty, parameters for future reductions of nuclear forces and the security of Europe, at the Helsinki Summit between Presidents Clinton and Yeltsin in March 1997. Based on these agreements, the US and Russia agreed on several arrangements regarding the ABM Treaty and START II Treaty in September 1997.

The Memorandum of Understanding on the ABM Treaty stipulates that the US, Belarus, Kazakhstan, Russia, and Ukraine are state parties to the Treaty. These five countries also signed three other documents related to the ABM Treaty. The "First Agreed Statement" regulated TMD systems with interceptors not exceeding 3 km per second, and the "Second Agreed Statement" regulated higher velocity TMD systems. In either case, it was made clear that the restrictions under the ABM Treaty would not be applicable to such TMD, unless the system could intercept ballistic missiles with velocities of 5 km per second and ranges exceeding 3500 km. The Second Agreed Statement further stipulated that member countries would not develop, test, and deploy space-based interception systems or components. The "Agreement on Confidence-Building Measures Related Systems to Counter Ballistic Missiles Other Than Strategic Ballistic Missiles" focused on information exchange concerning the US Theater High Altitude Area Defense (THAAD) and Navy Theater Wide Defense (NTWD), and the SA-12s in Russia, Belarus and Ukraine.

The US and Russia also signed the Protocol on the START II Treaty, which included agreement on extending the date for dismantling strategic nuclear delivery vehicles under START II from the original January 1, 2003 to December 31, 2007. At the aforementioned summit in Helsinki, the US and Russia also agreed to reduce the number of strategic nuclear warheads to less than 2000-2500 by December 31, 2007 as part of a basic framework for a Strategic Arms Reduction Treaty III (START III).

It was expected that these agreements would persuade Russia to ratify START II. However,

Russia was offended when the US began promotion, even if limited, of National Missile Defense (NMD) in 1998, and the ratification process again stopped. The US proposed a Protocol on the ABM Treaty in 2000, which included a provision to allow the deployment of 100 interceptor missiles to defend a limited area of the US and Russia against attacks using certain long range ballistic missiles. Russia, however, also opposed this proposal.

President Vladimir Putin, who succeeded Yeltsin, placed highest priority on the ratification of the START II Treaty and, in April 2000, Russia ratified the START II Treaty, its Protocol, and the ABM Treaty-related documents. However, Russia's domestic laws relating to the ratification of START II stipulates US ratification of the START II Protocol and documents relating to the ABM Treaty as a condition for exchanging ratification instruments for the START II Treaty. Since the US had not ratified these documents, they did not come into force. The reason the US could not ratify them was that the conservatives in the Republican Party maintained that the US should further promote NMD, and strongly criticized the ABM Treaty-related documents of the Clinton Administration.

The George W. Bush Administration inaugurated in 2001 clearly stated a policy not to have START II entry into force. As the US withdrew from the ABM Treaty in December 2002, Russia, in turn, indicated that it would not be bound by START II. These moves leave no prospects that START II will take effect and START III established.

3. Post 9/11: Active Promotion of MD

1) US Withdrawal from the ABM Treaty

In his May 2001 speech at the National Defense University, President Bush stated that the US and Russia should replace the ABM Treaty, based on distrust and the remnants of hostility from the Cold War, with a new framework reflecting a clear and complete departure from the past. Soon afterward, Deputy Defense Secretary Paul D. Wolfowitz stated that progress on missile defense development would inevitably infringe upon the ABM Treaty and, moreover, that such a situation might arise not in several years but within several months.[8]

For the Bush Administration, early withdrawal from the ABM Treaty was an unavoidable step in promoting a flexible MD program. The Bush Administration aimed to build a multi-layered defense network that would include sea-, air-, and space-based capabilities in addition to fixed ground-based systems. However, the development of such systems for intercepting long-range

[8] Paul D. Wolfowitz, Deputy Secretary of Defense, "Prepared Testimony," prepared testimony on ballistic missile defense policies and programs in review of the Defense Authorization Request for Fiscal Year 2002, United States Senate Committee on Armed Services, July 12, 2001.

ballistic missiles was prohibited under the ABM Treaty. Moreover, there was concern that even the construction of a test bed in Alaska might infringe upon the ABM Treaty, which prohibited the preparation of an ABM base for defense of national territory.

In consideration of these possibilities, the Bush Administration officially notified Russia of its withdrawal from the ABM Treaty on December 13, 2001; the withdrawal became effective six months later. In announcing this action, the Bush Administration noted the proliferation of WMD and ballistic missiles among state and non-state entities prepared to use such weapons against the US.[9]

The US withdrawal was unilateral without agreement from Russia, and there was concern that Russia and China might start massive build-ups of nuclear capabilities. However, such concerns have not materialized. President Putin's criticism was rather restrained. He stated that "the present level of bilateral relations between the Russian Federation and the US should not only be preserved but should be used for working out a new framework of strategic relations as soon as possible," and proposed the reduction of strategic nuclear weapons "to the level of 1,500-2,200 nuclear warheads for each side."[10]

2) Treaty on the Strategic Offensive Reductions (Moscow Treaty)

After the US notification of its withdrawal from the ABM Treaty, the US and Russia began to negotiate the reduction of their strategic nuclear weapons. The negotiations concluded in about six months and, in May 2002, Presidents Bush and Putin signed the Strategic Offensive Reductions Treaty (Moscow Treaty), which entered into force in June 2003.

The Moscow Treaty stipulated that both countries reduce the number of deployed strategic nuclear warheads to 1700-2200 by the end of 2012. Consisting of only five articles, the Moscow Treaty was created under the basic understanding that the US and Russia are no longer enemies and, unlike earlier nuclear arms control agreements, it does not describe methods for reducing arms, the composition of strategic nuclear forces after the reduction, the dismantlement of reduced strategic offensive weapons, or verification mechanisms.

One factor that led both the US and Russia agree on the Moscow Treaty was that each party could incorporate its interests with regard to strategic nuclear weapons. From the US view, the

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[9] "Text of Diplomatic Notes Sent to Russia, Belarus, Kazakhstan and Ukraine," December 13, 2001 [http://www.state.gov/r/pa/prs/ps/2001/index.cfm?docid=6859].
[10] "Televised statement by Russian President Vladimir Putin," December13, 2001, reprinted in ACRONYM Institute's website [http://www.acronym.org.uk/docs/0112/doc01.htm].

Moscow Treaty would secure flexibility in strategic nuclear forces. For Russia, the Moscow Treaty maintained a quantitative balance with the US in strategic nuclear forces, while removing the obligations to reduce MIRVed ICBMs. Moreover, agreeing to the Moscow Treaty served Russia's desire to maintain equivalence in superpower status with the US.

In addition, the Moscow Treaty emphasized the cooperative relationship between the US and Russia developed since the 9/11 terrorist attacks. Through such a relationship, both countries could further their cooperation, and expect support from each other over a broad range of problems.

3) New Movement toward the Prevention of Proliferation

While arms control between the US and Russia made great strides forward, the situation surrounding the proliferation of WMD and missiles was being exacerbated by the presence of a nuclear black market, the revelation of clandestine nuclear programs, the proliferation of WMD and missiles among states of proliferation concern such as North Korea, cooperative relationships among such states, and even the possibility of international terrorist groups and non-state actors acquiring and using such weapons.

With the proliferation issue being aggravated, the attention of the international community is focused on the Proliferation Security Initiative (PSI), which aims to locate aircraft and ships with doubtful cargo and seize them, if possible, to prevent transfer to states of proliferation concern or terrorists. PSI was first proposed by President Bush in June 2003, and then embodied in the "Statement of Interdiction Principles" in September 2003. PSI is centered on a core group of 15 countries, including Japan. Already 70 countries have agreed to the Declaration. PSI member countries have endeavored to prevent illegal transfers at various locations throughout the world. Japan hosted the maritime prevention exercise called "Team Samurai '04" in October 2004.

Most of the actual performance and records of PSI activities are classified but they are expected to bring some results. For example, a ship carrying equipment for centrifuges to Libya was inspected off the coast of Italy in November 2003, and the related cargo was seized. This incident actually led to Libya's decision to abandon its nuclear weapons development program. Moreover, it revealed the existence of a nuclear black market, so this is considered an important achievement of the PSI.

As the PSI is implemented within the laws of each country as well as under existing international law, there are certain restrictions on high seas activities to inspect and seize cargo on third country

flag ships. Therefore, the US has been trying to expand effective PSI areas by signing ship boarding agreements with those countries offering flags of convenience, such as Panama and Liberia. In addition, the Protocol to the Convention for the Suppression of Unlawful Acts against the Safety of Maritime Navigation (SUA Convention) was adopted in October 2005 to enable the inspection of ships illegally transferring cargo related to WMD.

Measures are also developing to prevent terrorist attacks using WMD. UN Security Council Resolution 1540 stated that member countries should prevent WMD proliferation by enacting and implementing domestic legislation. In addition, the International Convention for the Suppression of Acts of Nuclear Terrorism was signed in September 2005.

In regards to proliferation of ballistic missiles, there was no international agreement except the export controls under the MTCR. However, the Hague Code of Conduct against Ballistic Missile Proliferation (HCOC) was concluded in November 2002, establishing the international norm against proliferation of ballistic missiles. As of October 2005, 123 countries, including Japan, have signed the HCOC. Although the HCOC is not legally binding, members have expressed their political will to observe it. The subscribing states to the HCOC resolve to exercise maximum possible restraint in the development, testing and deployment of ballistic missiles capable of delivering WMD; not to use peaceful Space Launch Vehicles (SLV) programs as a cover for ballistic missile development; not to support the development of ballistic missiles in countries that could possess WMD; and to implement confidence-building measures such as advance notice of the launching of ballistic missiles or SLVs.

The establishment of the HCOC is a great achievement toward the non-proliferation of ballistic missiles. However, because it is not legally binding, and countries actively continuing ballistic missile-related activities such as North Korea are not participating, its universality and effectiveness is not sufficient. Given the aggravated state of WMD proliferation, ballistic missile defense will remain important for the foreseeable future.

3. Roles of Japan's Ballistic Missile Defense (BMD)

1) Trends among Northeast Asian Countries

Unlike Europe, where treaties such as the Treaty on Conventional Armed Forces in Europe (CFE) have been implemented, Northeast Asia has no specific measures for arms control, disarmament, or non-proliferation, although individual countries have joined international agreements.

Among various nuclear arms control agreements made between the US and Russia, the INF

Treaty and the unilateral nuclear disarmament measures of September and October 1991 are directly applicable to the security of Northeast Asia. Under the INF Treaty, the possibility of the US and the Soviet Union deploying INFs in their own territories or in allied countries, including those in Northeast Asia, was eliminated. In addition, the unilateral nuclear disarmament measures adopted by the US and the Soviet Union clearly led to the removal of all sea-based non-strategic nuclear weapons, including Ship-Launched Cruise Missiles (SLCM) and ground-based non-strategic nuclear weapons deployed in allied countries. The US also removed all nuclear demolition munitions placed in South Korea during the Cold War.

China is the only country among the five nuclear-weapon states that has not reduced its nuclear weapons, but rather increased their number. China's principles on arms control are: to maintain its status as a major power in the international community while strengthening its image as a true advocate of peace and arms control; to avoid substantial reduction in its military forces while trying to suppress the capabilities of other major powers; and to protect its own interests fully when participating in any arms control measure.[11]

Moreover, China asserts that disarmament should not be a tool for superpowers to control lesser powers, nor a handful of countries to seek one-sided superiority in security.[12] In terms of numbers of nuclear weapons possessed, China is far behind the US and Russia, so China is not likely to accept arms control on nuclear weapons that fixes its disadvantage.

Concerning non-proliferation, all Northeast Asian countries except North Korea are parties to the NPT, BWC and CWC. North Korea had joined the NPT and BWC, but it declared its intent to withdraw from the NPT in January 2003, so its legal status is currently under discussion. North Korea is also said to possess biological weapons in violation of the BWC. North Korea is not a party to the CWC, and is said to have a massive amount of chemical weapons.

Japan, South Korea and the US are all members of international export control regimes and have

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[11] See Alastair I. Johnston, "China Enters the Arms Control Arena," *Arms Control Today*, Vol. 17, No. 6 (July/August 1987), p. 17; Robert G. Sutter, "Chinese Nuclear Weapons and Arms Control Policies: Implications and Options for the United States," *CRS Report for Congress*, 94-422S (March 25, 1994) [http://www.fas.org/spp/starwars/crs/94-422s.htm]; Banning N. Garrett and Bonnie S. Glaser, "Chinese Perspectives on Nuclear Arms Control," *International Security*, Vol. 20, No. 3 (Winter 1995/96), pp. 43-78; Robert A. Manning, Ronald Montaperto and Brad Roberts, *China, Nuclear Weapons, and Arms Control: A Preliminary Assessment*, Chairmen's Report of a roundtable jointly sponsored by the Council on Foreign Relations, the National Defense University and the Institute for Defense Analysis, 2000, pp. 64-72.

[12] "China's General Position on Arms Control and Disarmament," Ministry of Foreign Affairs of the People's Republic of China [http://www.fmprc.gov.cn/eng/4485.html].

developed domestic export control systems, including "catch-all" systems.[13] Russia is not a member of the Australia Group. China joined the NSG (Nuclear Suppliers Group) in June 2004, but has not participated in other export control regimes. As mentioned in Chapter 2 of this book, both China and Russia are considered suppliers of WMD, missiles, and missile-related materials and technologies, although China argues that it has made efforts to strengthen export controls over such materials.[14]

On missiles, China has argued that it implements export controls in conformity with the MTCR guidelines although not a member of the MTCR yet. In August 2002, China passed a domestic law to control exports of missiles and related items and technologies.[15] However, because China lacks the practical capability to implement a catch-all system, and because the People's Liberation Army's involvement in export control may hamper detailed inspection of exported materials, equipment and technologies from PLA-related companies, China is not considered to be implementing effective export control.[16]

Neither China nor North Korea participates in the HCOC. Although the HCOC is not legally binding, the failure of China and North Korea to commit to a framework for preventing the proliferation of missiles is not favorable for the security of Northeast Asia, as both countries continue to build up their missile forces. Moreover, this fact undermines the effectiveness of non-proliferation efforts.

In regard to North Korea, especially its nuclear weapons program, negotiations continue through the Six-Party Talks. In September 2005, the Six Parties adopted their first joint statement, with North Korea being committed to give up its existing nuclear program as well as all nuclear weapons, and to rejoin the NPT. However, discussions remain stalemated with little prospect of resolution.

Upon North Korea's launching of ballistic missiles in July 2006, Japan and the US sought the adoption of a UN Security Council resolution stipulating economic sanctions, while China and Russia argued that a statement by the President of the UN Security Council would be preferable

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[13] However, there were several cases recently, where Japanese companies illegally export arms related materials. It needs to further strengthen implementation of export controls.
[14] See Ministry of Foreign Affairs, People's Republic of China, "China's Efforts in Arms Control, Disarmament and the Prevention of Proliferation," September 2005 [http://www.china-embassy. or.jp/jpn/ gfzc/t213080.htm].
[15] See Ministry of Foreign Affairs, People's Republic of China, "Chinese policies and measures for the prevention of proliferation," December 2003 [http://www.pekinshuho.com/2003.50/200350-wenxian1.htm].
[16] Stephanie C. Lieggi, "Overview of China's Export Control System," *Asian Export Control Observer*, Center for Nonproliferation Studies, Monterey Institute of International Studies, Issue 2 (June 2004), pp. 15-16.

and stated that they would veto any resolution that included sanctions. South Korea also opposed the adoption of sanctions.

Ultimately UN Security Council Resolution 1695 stipulated that North Korea's launching of ballistic missiles capable of carrying WMD warheads violated its commitment to continue a moratorium on missile launches. The resolution demanded North Korea cease missile-related activities, reconfirm its moratorium on missile launches, and commit to an immediate and unconditional return to the Six-Party Talks. It also "requires all Member States, in accordance with their national legal authorities and legislation and consistent with international law, to exercise vigilance and prevent the procurement of missiles or missile related-items, materials, goods and technology from the DPRK, and the transfer of any financial resources in relation to DPRK's missile or WMD programmes."

However, North Korea rejected the resolution only 45 minutes after its adoption, and suggested the possibility of further missile launches. In its return to the Six-Party Talks, North Korea has not withdrawn its condition that the US remove financial sanctions against North Korea.

On the other hand, members of the Six-Party Talks other than North Korea have agreed on utilizing the Six-Party Talks as a forum to discuss various issues concerning the security of the Korean Peninsula, including nuclear and missile issues. Japan is expected to take a more active role at the Talks, using them as a platform to implement what this book calls "Dissuasion Diplomacy."

2) Needs and Implications of Ballistic Missile Defense (BMD)

Japan considers the promotion of arms control, disarmament, and non-proliferation as one of the main pillars of its diplomacy. Not only has Japan joined major treaties related to arms control, disarmament, and non-proliferation, and complied with their obligations, it has also actively contributed to further strengthening arms control, disarmament, and non-proliferation measures.[17]

It will be most preferable for missile threats to be reduced through such diplomatic efforts. Yet the world has already seen the extensive proliferation of missiles capable of WMD delivery. There is hardly any prospect of missile-armed countries eliminating them. On the contrary, missile

[17] For Japan's diplomacy in arms control, disarmament, and non-proliferation diplomacy, see Disarmament, Non-Proliferation and Science Department, Ministry of Foreign Affairs (ed.), *Japan's Disarmament and Non-Proliferation Policy*.

capabilities are being strengthened. As noted before, there are no treaties or agreements to prohibit the possession or proliferation of missiles, and export control measures can only provide limited effects.

Japan actually faces the threat of ballistic missiles with WMD warheads, including nuclear weapons. That is why Japan is putting much effort into diplomacy to reduce such threats and, at the same time, increasingly needs ballistic missile defense to deter and defend against their use.

Japan's BMD efforts and Japan-US cooperation in this area may have significant implications for the promotion of arms control, disarmament and non-proliferation. For example, if the BMD system is sufficiently effective, then adversaries will have fewer incentives to possess or increase such capabilities, which in turn will promote non-proliferation. Moreover, the enhancement of US deterrence by denial capabilities through missile defense will increase potential US military actions to enforce compliance of non-proliferation obligations, thus complementing the non-proliferation regime.

At present, neither the non-proliferation regime nor the United Nations can be expected to make appropriate responses — especially coercive — to violations of non-proliferation obligations. Rather, coercive (especially military) measures are usually undertaken by major powers that lead the international order.[18]

Development of both BMD and non-proliferation measures could lead to a reduction in the role and size of US nuclear forces, which has been required to deter the use of WMD and/or ballistic missiles. Such reduction would restrain the US build-up of nuclear forces, could make further reductions possible, and enable the US to take further arms control initiatives.

3) Desirable Policies for Japan

a) Effective Use of Ballistic Missile Defense (BMD)

Japan should consider the utilization of BMD to increase the effectiveness of its efforts on arms control, disarmament and non-proliferation.

Japan has abandoned the possession of nuclear weapons, strongly argued against the proliferation of nuclear weapons, and advocated their ultimate elimination. Japan's claim has won strong support from the international community, as proven by the fact that the nuclear disarmament

[18] See Masatsugu Naya, "Political Studies of 'Military Sanction,'" *Kokusai Mondai*, No. 242 (May 1980), pp. 39-40 (in Japanese).

resolution Japan has proposed every year to the General Assembly of the United Nations has been adopted by overwhelming majorities.

However, Japan's efforts have not led to substantial outcomes on nuclear arms control and disarmament, a continuing dilemma for Japan and the world. Progress on nuclear arms control and disarmament is, of course, influenced strongly by the security situation at the time. However, the fact that Japan has never possessed weapon systems that might impact the security of countries with nuclear weapons may lessen its persuasive power.

If Japan is to continue calling on the world to eliminate nuclear weapons, then it needs to have an effective card to strengthen its involvement in such an argument. Ballistic missile defense can be just that key "strategic" system.

We must not forget that the history of nuclear arms control and disarmament is strongly linked with that of the build-up of nuclear weapons and/or missile defense forces. Even if one country wants to promote arms control and disarmament, it will not succeed unless other countries participate in such efforts. To encourage such participation, these countries need to be assured that acceding to restraints on their own military forces will actually strengthen their own security. Meanwhile, the build-up of nuclear weapons and/or missile defense forces could provide a way to increase a sense of security in other parties.

In the relationship between Japan and China, for example, even if Japan presses China to reduce weapons that directly threaten Japan, China will not likely concede unless it can obtain something of value in return. Although the BMD system Japan is to introduce is defensive in nature, it can be developed into a capability that could strongly influence China's nuclear strategy. In this respect, it could become a card to bring China to the negotiating table on arms control and disarmament.

If Japan and China start a "strategic" security dialogue beyond what they have done in the past by including issues such as nuclear weapons, ballistic missiles, BMD, and arms control and disarmament, both countries could reduce tensions through exchanges of information to increase transparency in their approaches to strategic weapons and arms control. They could also develop confidence-building measures. Such talks would undoubtedly benefit both Japan and China by reducing the possibility of a security dilemma.

If such confidence-building measures could be developed into arms control and disarmament

agreements, both countries could enhance their security. For this, however, both countries need to find a balance between Japan's ballistic missile defense forces and China's nuclear/ballistic missile forces, including the most appropriate levels for Chinese missile and Japanese missile defense capabilities.

Generally, if there is strong asymmetry in armaments, it is extremely difficult to attain progress on arms control and disarmament. Therefore, for building arms control and disarmament measures in Northeast Asia, it may be necessary to have measures that cover the nuclear and BMD capabilities of the US in addition to those of Japan and China.

Needless to say, if Japan utilizes BMD as a card, Japan itself may be restricted on the types, qualities and numbers of BMD systems. As Japan is to use BMD for deterrence and defense, there is no need to be bound by the use of BMD as a tool if security interests can be obtained by other methods. Yet there is no guarantee that other parties will continue to observe arms control/disarmament agreements, and a new threat could arise. Therefore, even if Japan accepts arms control on BMD, Japan inevitably needs to maintain a certain level of BMD capability as well as a relevant industrial/technology base.

b) Roles of Arms Control, Disarmament, and Non-Proliferation

Promotion of regional and international arms control, disarmament, and non-proliferation along with the introduction of BMD systems will be extremely beneficial to national and regional security. Japan would certainly benefit its interests by continuing to take the initiative in such efforts. Such efforts by Japan would be significant, first of all, for mitigating the security dilemma, and any arms race that could arise from introduction of BMD. Ordinarily, a security dilemma can be weakened if the balance between offensive and defensive power shifts to the advantage of defensive power.[19]

In this respect, it is not the characteristics of such weapons, but the intent of a country that is important. In other words, the introduction of a defensive weapon system like BMD could result in increased spending on an offensive posture. If country A fears that country B, which is to introduce BMD, may intend to attack it, then country A will likely reinforce its defense capabilities. If country B sees country A building up its military forces, country B may further build up its own forces.

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[19] Charles L. Glaser, "The Security Dilemma Revisited," *World Politics*, Vol. 50, No. 1 (October 1997), p. 185.

Japan's introduction of BMD might be taken as an increase in military forces by other countries, so such efforts may not necessarily have favorable effects on arms control, disarmament and non-proliferation. As the intent of other countries here is merely an estimate, it is possible that other countries may assume the worst scenario.

Still, Japan may be able to use the introduction of BMD to start the talks on arms control and disarmament. If such talks can lead to better understanding on intents and capabilities, it will enhance transparency on future plans for strategic weapons and deterrence systems, which can in turn enhance mutual trust and encourage progress on arms control initiatives. Japan's commitment to arms control, disarmament, and non-proliferation efforts can discredit the view introduction of BMD is a stepping stone to more offensive military forces, including nuclear weapons.

Promotion of arms control, disarmament, and non-proliferation efforts, especially in relation to ballistic missiles, may enable Japan to pursue BMD capabilities in a practical way. Japan may not be able to acquire all desired BMD capabilities because of budgetary and technological limitations. Moreover, ballistic missiles are not the only threats to which Japan must respond. Under such situation, if a ballistic missile threat can be limited through arms control, disarmament, and non-proliferation measures, Japan can reduce its BMD budget.

To repeat, the introduction of a BMD system does not necessarily work favorably for arms control, disarmament, and non-proliferation. There is always a possibility that such action may bring military build-ups, or further proliferation of ballistic missiles and other weapons. In this sense, the introduction of a BMD system is "a double-edged sword."

When attempting to improve the current situation through arms control, disarmament, and non-proliferation initiatives, those countries not satisfied with current situation may not agree to such measures. It is certainly not easy to control weapons, when the weapons concerned are asymmetrical and differ in types.

Even if negotiation on the arms control of ballistic missiles takes place, there would be no ideal arms control measure to balance ballistic missiles and BMD systems. What will be the number of BMD systems that can be considered equivalent to one ballistic missile? How to calculate the capabilities of ballistic missiles and ballistic missile defense?

These are the questions that are essential in considering arms control, disarmament, and

non-proliferation measures for both offensive and defensive weapons. There are no easy answers to such questions. If the ballistic missiles of one country are not only directed at a country that has BMD capability, the value of possessing such ballistic missiles will not likely diminish so much, even when faced by the ballistic missiles defense of one country.

While there are such difficulties, it is necessary more than ever to promote arms control, disarmament, and non-proliferation along with the introduction of BMD systems, to reduce the threats of ballistic missiles, mitigate destabilizing implications of BMD, and enhance BMD effectiveness. Such efforts can have significant effect in the future.

Chapter 9 Establishing Deterrence Posture

1. Ballistic Missiles Defense (BMD) and Deterrence Posture

"Deterrence" can be defined as a way to dissuade another country from taking aggressive actions by demonstrating, in advance, a capability and willingness to inflict serious damage in retaliation. If it becomes possible to dissuade a country possessing ballistic missiles from using such weapons, in other words "deterring" such use, that will prevent direct or indirect damage from ballistic missile attacks or intimidation through the possibility of such attacks. Achieving deterrence involves three elements: capability to deliver serious damage, willingness to use such capability, and recognition of such capability and willingness by other countries. Ways of deterrence can be divided into "deterrence by punishment," which is to deter attacks through intimidation by massive retaliatory attacks; and "deterrence by denial," which emphasizes capability to limit damage and prevent achieving the objectives of an attack, thereby causing the other country to realize the uselessness of such actions.[1]

Typical deterrence by punishment is massive attack using nuclear weapons retaliatory. Nuclear weapons certainly represent the capability to deliver devastating damage, which another country can easily recognize. However, it is not easy to enhance the credibility of such deterrence by punishment by demonstrating a willingness to use nuclear weapons, or having others "realize" such willingness, since there are concerns over counter-counter-attacks, as well as moral restraints against the use of nuclear weapons. Undoubtedly, another country cannot be sure that there is absolutely no possibility of using nuclear weapons. It is also difficult to predict when and in what case another country will use nuclear weapons as retaliation. As the capabilities of nuclear weapons are obvious, another country will inevitably take a cautious approach to the determination of their use.

Not only nuclear weapons but also conventional weapons can provide deterrence by punishment. The US, especially, possesses conventional weapons with destructive power equivalent to low-yield nuclear weapons. Precision guidance weapons can also be used as retaliation through pin-point attacks against enemy's high-value targets or their leadership. Since conventional weapons have a much lower threshold to their actual use than nuclear weapons, it is easier for an enemy to realize a willingness to use them, making the credibility of conventional weapons for deterrence by punishment higher. Still, the value of deterrence by punishment will lose value unless an enemy realizes that conventional weapons can inflict colossal damage.

Ballistic missile defense, on the other hand, can be classified as a typical means of deterrence by

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[1] See Glenn H. Snyder, *Deterrence and Defense: Toward a Theory of National Security* (Princeton: Princeton University Press, 1961), pp. 14-16.

denial. A country that possesses a BMD system undoubtedly has strong willingness to use such capability to limit damage from ballistic missile attacks. An enemy can easily realize such willingness. So the credibility of deterrence by denial can be higher than that of deterrence by punishment. Moreover, even if deterrence did not work, denial capability through BMD can be used to limit damage by intercepting ballistic missiles.

Of course, if an enemy perceives a lower interception capability of BMD, then it will see a lower possibility of its ballistic missiles attacks being deterred. In addition, BMD does not provide unacceptable damage to an enemy, unlike more offensive nuclear weapons. Since deterrence by denial provides less deterrence power than deterrence by punishment, it has been suggested that deterrence by denial has slight value if defense capability is not sufficiently strong.[2] Whether BMD can function as deterrence largely depends on an assured capability to intercept ballistic missiles sufficient to prevent an enemy from achieving its objectives, and thus causing an enemy to recognize such capability.

From such viewpoint, it becomes necessary to add denial capabilities against ballistic missile attacks by adopting offensive defense measures such as pre-emptive attacks on ballistic missile bases, and passive defense measures that confine damage from ballistic missile hits, in addition to active defense through BMD. While each measure for active defense, offensive defense or passive defense is no perfect by itself, combining these measures can optimize capability to respond against ballistic missile attacks, thereby improving deterrence by denial.[3]

2. US Missile Defense and Deterrence Strategy

1) Cold War Era: MAD between the US and the Soviet Union

While making efforts to build up strategic nuclear weapons in the late 1960s, the US and the Soviet Union reached the situation of so called "Mutual Assured Destruction" (MAD), in which both countries possessed "assured destruction capability" sufficient to retaliation even after receiving first strike.[4]

In the US, the dominant concept of that time was that having the US and the Soviet Union in a

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[2] See Glen H. Snyder, "Deterrence by Denial and Punishment," Davis B. Bobrow (ed.), *Components of Defense Policy* (Chicago: Rand McNally & Company, 1965), pp. 209-237.

[3] However, a deterrence relationship built by combining both punishment and denial capabilities will make strategic calculation more complex. Under such a situation, while each side will act more cautiously, it would likely miscalculate the "capability" and "willingness" of the other side. Such miscalculation does not necessarily have adverse effects. If each side overestimates the capability and willingness of the other party, deterrence becomes more effective to both sides. Of course, there is an opposite case, where each side underestimates the other's capability and willingness, which frequently leads to the failure of deterrence. To maintain a stable deterrence relationship, both sides need to recognize capability and willingness more accurately through an appropriate level of communication.

[4] See Robert S. McNamara, "Hearing on Military Posture before the U.S. Congress," *Authorization for Military Procurement, Research, and Development, 1969*, hearing before the Committee on Armed Services, U.S. Senate, S3293, reprinted in Haley, *et al*, *Nuclear Strategy, Arms Control, and the Future*, pp. 81-91.

MAD situation would be preferable to maintaining strategic stability where the possibility of strategic war would be reduced.[5] By possessing invulnerable assured destruction capability, both countries would have fewer motives to conduct first strike (crisis stability). In addition, since it would be meaningless to possess strategic nuclear forces greater than those needed to maintain an assured destruction capability, the inducements for arms races would also be reduced (arm race stability).[6]

To maintain MAD required that both the US and the Soviet Union have retaliatory forces with high survival rates, and that both would not seek damage limitation measures that might threaten each other's retaliatory capability. One such damage confinement measure was ballistic missile interceptors (Anti-Ballistic Missiles: ABM), so the deployment of ABMs was seen to threaten MAD, and hence the strategic stability. Thus the ABM Treaty in 1972 was seen to institutionalize the MAD situation.

The US declaratory policy was assured destruction strategy, which emphasized deterrence by punishment that depended on counter-value attacks. However, in the employment policy that set targets for nuclear forces, the US stressed the need for counter-force attacks on military targets by strategic nuclear weapons.[7] In March, 1983, President Reagan questioned the morality of MAD in that it deterred wars by holding civilians hostage and announced a plan to remove the threat of strategic nuclear missiles by building a defense system "rendering these nuclear weapons impotent and obsolete."[8] This plan was later named the Strategic Defense Initiative (SDI). President Reagan stated that SDI would become an important tool to realize a significant reduction and eventual elimination of ballistic missiles and nuclear weapons on such missiles in the US and the Soviet Union.[9]

At first, SDI was described as a long term program to end entrapment by MAD by eliminating

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[5] Paul Stockton, "Strategic Stability between the Super-Powers," *Adelphi Papers*, No. 213 (1986), p. 3.
[6] See Tetsuya Umemoto, *Nuclear Weapons and International Politics: 1945-1995* (Tokyo: Japan Institute of International Affairs, 1996), pp. 102-103 (in Japanese).
[7] See Desmond Ball, "The Development of the SIOP, 1960-1983," Desmond Ball and Jeffrey Richelson (eds.), *Strategic Nuclear Targeting* (Ithaca: Cornell University Press, 1986), p. 70; Eric Mlyn, *The State, Society, and Limited Nuclear War* (New York: State University of New York Press, 1995), pp. 55-83.
[8] Ronald Reagan, "Address to the Nation on Defense and National Security," March 23, 1983[http:// www. reagan.utexas.edu/resource/speeches/1983/32383d.htm]. Regarding the analysis of this speech, see Gordon R. Mitchell, *Strategic Deception: Rhetoric, Science, and Politics in Missile Defense Advocacy* (East Lansing, Michigan: Michigan State University Press, 2000), pp. 52-56.
[9] Ronald Reagan, "Foreword Written for a Report on the Initiative, December 28, 1984," reprinted in *Nuclear Files Archive* [http://www.nuclearfiles.org/docs/1984/841228-reagan-sdi.html]. Some argued that a stronger air defense system and civil defense network, as well as more effective non-nuclear strategy would be needed in addition to missile defense. See Leon Sloss, "The Strategist's Perspective," Ashton B. Carter and David N. Schwartz (eds.), *Ballistic Missile Defense* (Washington D.C.: Brooking Institution, 1984), p. 46.

nuclear missiles.[10] Later, the US changed its policy to deploy BMD as a damage limitation capability through defense of its ICBM bases.[11] Whatever the US purposes were, developing SDI was thought to be difficult given massive Soviet nuclear forces. The technological feasibility of highly effective missile defense was uncertain, and it was easily assumed that the cost to build a BMD network that would enable abandonment of MAD would be tremendous. Furthermore, it was likely that the Soviet Union would try to confront the US BMD networks, and that it would be extremely difficult to offset any such Soviet effort. There was also concern that the potential for Soviet first strike might increase if the US departure from MAD through missile defense was perceived to compromise Soviet retaliatory capability, or if the US BMD deployment was seen to demonstrate an intention to launch first strike.

The practice of MAD during the Cold War in reality created a "long peace"[12] by preventing direct military confrontation between the US and the Soviet Union, as well as restraining regional conflicts that might lead to their confrontation. Under this situation, promoting ballistic missile defense would have made it difficult to maintain such strategic stability. It was thought that to leave MAD behind would take time, and that the process itself might threaten US-Soviet stability, and hence the stability of the international community.

2) Post Cold War: Building Deterrence by Denial against Rogue States

Following the end of the Cold War, it became clear to the US that some rogue states, hostile to the US and possessing WMD as well as ballistic missiles, could pose serious threats in regions critical to the US interests. Moreover, the US thought that deterrence by punishment, whether with nuclear or conventional weapons might not by itself be sufficient to deter rogue states from using WMD and ballistic missiles.

Firstly there is asymmetry in the motives of the US and rogue states. The interests of rogue states in regional conflicts are most likely the vital; to win or lose a regional conflict might put the state and its leadership in a critical situation. The US interests in regional conflicts, on the other hand, would not likely threaten national survival. Secondly, due to legal, political and moral restrictions, it is difficult for the US to use nuclear weapons against rogue states. Thirdly, rogue states leaders might have values, methods, and purposes different from those of the Western world,

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[10] On the shift toward such deterrence posture, see Paul H. Nitze, "On the Road to a More Stable Peace," address to the Philadelphia World Affairs Council, 20 February 1985, reprinted in Samuel F. Wells, Jr. and Robert S. Litwak (eds.), *Strategic Defenses and Soviet-American Relations* (Cambridge, Massachusetts: Ballinger Publishing Company, 1987), pp. 194-196.

[11] Deputy Secretary of Defense Lehman also argued that BMD would improve the survivability of the US strategic forces, improve the effectiveness of the US retaliatory capability, and raise risk for Soviet military planners, thereby further strengthening the US deterrence. See Ronald F. Lehman III, "The Arms Control Legacy of the Reagan Administration: A Focus on START," *Strategic Review*, Vol. XVI, No. 4 (Fall 1988), p. 19.

[12] John L. Gadis, *Long Peace: Inquiries into the History of the Cold War* (New York: Oxford University Press, 1987).

and so might make decisions that would be considered irrational by Western standards.[13]

If US deterrence by punishment is not effective, there is another concern that rogue states threats of WMD and ballistic missiles might deter the US from intervening in regional conflicts. Such concern led to the argument that the US should seek damage limitation measures in addition to deterrence by punishment.[14] In the case of ballistic missiles being widely proliferated to rogue states, BMD has become an important way to limit damage when non-proliferation measures fail and the US deterrence by punishment will not function, thereby leading to use of such weapons. If BMD enables damage limitation, the US can lessen the possibility of being deterred by the threat of attacks from rogue states.[15] As demonstrated by the deployment of Patriot missiles during the Gulf War, BMD can also provide a sense of security to allied or friendly countries, and thus maintain solidarity between the US and its allies. In this way some argue that BMD can provide the benefit of securing worldwide freedom of action for the US.[16] In addition, if BMD capability can be deployed worldwide, rogue states may realize the uselessness of ballistic missile attacks against the US and its allies. In other words, BMD could function as deterrence by denial.[17] As rogue states possess tens or hundreds of theater ballistic missiles, the interception of their missiles is not technologically impossible, and it is unlikely that they can acquire sufficient ballistic missiles forces to overwhelm the US BMD capability.[18]

The idea of a lower credibility of deterrence by punishment against rogue states, and the higher probability of their using WMD, was recognized under the Clinton Administration, even if it did not clearly state the need for shifting deterrence by punishment to deterrence by denial. That is why the Clinton Administration launched the counterproliferation initiatives and as a part of it continued to promote BMD.

3) Post 9/11 Terrorist Attacks: Further Inclination toward Deterrence by Denial

From its inauguration the George W. Bush Administration indicated its intent to actively promote missile defense. After the 9/11 attacks, it clearly emphasized deterrence by denial against rogue states and non-state actors such as terrorist groups.

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[13] For summaries of such reasoning, see Keith B. Payne, *Deterrence in the Second Nuclear Age* (Lexington, Kentucky: University Press of Kentucky, 1996), pp. 79-119. See also Keith B. Payne, "Deterring the Use of Weapons of Mass Destruction: Lessons from History," *Comparative Strategy*, Vol. 14, No. 4 (1995), p. 348.
[14] For such arguments, see Payne, *Deterrence in the Second Nuclear Age*, pp. 129-136; Colin S. Gray, "Deterrence and Regional Conflict: Hopes, Fallacies, and Fixes," *Comparative Strategy*, Vol. 17, No. 1 (1998), pp. 52-55.
[15] See Keith B. Payne, "Proliferation, Deterrence, Stability and Missile Defense," *Comparative Strategy*, Vol. 13, No. 1 (1994), p. 126; Payne, "Deterring the Use of Weapons of Mass Destruction," p. 354.
[16] Malcolm O'Neill, "Stability and Ballistic Missile Defenses," *Comparative Strategy*, Vol. 13, No. 1 (1994), p. 115.
[17] See Robert G. Joseph, "Nuclear Deterrence and Regional Proliferators," *The Washington Quarterly*, Vol. 20, No. 3 (Summer 1997), pp. 169-170; O'Neill, "Stability and Ballistic Missile Defenses," p. 115; Payne, *Deterrence in the Second Nuclear Age*, pp. 142-152.
[18] See Michael Krepon, "Are Missile Defenses MAD?: Combining Defenses with Arms Control," *Foreign Affairs*, Vol. 74, No. 1 (January/February 1995), pp. 22-23.

The Nuclear Posture Review of the Bush Administration submitted to Congress at the end of 2001 established a "New Triad" of offensive systems (nuclear and non-nuclear forces), defensive systems (active and passive defense), and revitalized defense infrastructure, rather than the "Cold War Triad" of ICBMs, SLBMs and heavy bombers. The report also stated that the US would improve its deterrence against WMD by developing defense capabilities including MD, and building non-nuclear offensive capabilities, while reducing its dependence on nuclear weapons. In its National Security Strategy (NSS) published in September 2002, the US determined that its "immediate focus will be those terrorist organizations of global reach and any terrorist or state sponsor of terrorism which attempt to gain or use weapons of mass destruction (WMD) or their precursors."[19] The NSS further noted that "deterrence based only upon the threat of retaliation is less likely to work against leaders of rogue states more willing to take risks, gambling with the lives of their people, and the wealth of their nations" and that the US "will not hesitate to act alone, if necessary, to exercise [its] right of self-defense by acting preemptively against such terrorists" as well as rogue states.[20] The National Strategy to Combat Weapons of Mass Destruction in December 2002 also stated that "[t]he US will continue to make clear that it reserves the right to respond with overwhelming force—including through resort to all of [its] options—to the use of WMD against the US, [its] forces abroad, and friends and allies."[21] Further, according to the National Strategy to Combat Weapons of Mass Destruction, the "U.S. military forces and appropriate civilian agencies must have the capability to defend against WMD-armed adversaries, including in appropriate cases through preemptive measures," and they "must stand ready to respond against the source of any WMD attack."[22]

The posture of deterrence by denial includes the offensive defense measure, such as surgical strikes and counterforce, and passive defense measures of limiting damages when hit, in addition to active defense such as MD. The Bush Administration has even portrayed preemptive actions and regime change against rogue state governments as elements of deterrence by denial strategy.

US inclination toward deterrence by denial reflects a post-9/11 appreciation of the threat from rogue states and non-state actors armed with ballistic missiles and/or WMD. Since non-state actors obviously do not have their own territory, there are hardly any targets that can be attacked retaliatory; thus deterrence by punishment is still less likely to function against such actors than would be the case with rogue states. On the other hand, at least, effectiveness of deterrence by denial is thought to be higher than deterrence by punishment. For deterrence against terrorism, deterrence by denial could prevent terrorist organizations from achieving their purposes. In

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[19] United States of America, *The National Security Strategy of the United States of America*, September 2002, p. 6.
[20] Ibid. p. 15.
[21] United States of America, *National Strategy to Combat Weapons of Mass Destruction*, December 2002, p. 3.
[22] Ibid.

other words, developing denial capabilities provides a capability to prevent the generation of "victims." If this becomes possible, terrorist organizations can no longer impress their "audiences." If so, terrorism is no longer an effective tool for such organizations, and the effectiveness of deterrence becomes higher.[23]

The Quadrennial Defense Review (QDR) submitted in March 2006 listed priority areas as: defeating terrorist networks; defending the homeland in depth; shaping the choices of countries at strategic crossroads; and preventing hostile states and non-state actors from acquiring or using WMD. It also stated a shift of focus toward challenges posed by irregular, catastrophic, and disruptive types of attacks, while maintaining capabilities to respond to against traditional challenges.[24] The QDR urged adoption of "tailored deterrence" that enables appropriate responses against various types of threats.[25] The "Strategic Deterrence Joint Operational Concept" issued in February 2004 depicted a security environment with serious implications for the US deterrence posture having unfamiliar enemies who would unhesitatingly take risks, contradictions between asymmetry in purposes and capabilities, and the vulnerability of American society as well as military forces.[26] The effective approach under such a situation is deterrence by denial rather than deterrence by punishment, so there is no doubt that the US will continue to reinforce its denial capabilities. With missile proliferation continuing, missile defense is likely to remain an important element in the US denial capabilities.

4) US Deterrence Posture toward Russia and China

The US deterrence posture after the Cold War shifted from focus on deterrence by punishment against the Soviet Union to deterrence by denial, assuming various threats from rogue states as well as non-state actors. Unlike the Cold War period, when it was sufficient to consider deterrence mainly based on the relationship between the US and the Soviet Union, today's world requires a deterrence posture under more complex international relationships. Promotion of MD by the Bush administration symbolizes this reality. Such changes in deterrence posture undoubtedly have implications for deterrence policies against two nuclear-weapon states: Russia, which was the focus of the US's deterrence policy for a long time, and China, which is emerging rapidly as a military power.

a. Toward Russia

As described before, President Bush stated in May 2001 that Russia was no longer an enemy of the US and proposed replace the ABM Treaty "with a new framework that reflects a clear and clean

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[23] Ken Jimbo, Sugio Takahashi and Kei Koga "Japan's Anti-Terrorism Measures: Building Multi-Layer Type Anti-Terrorism Deterrence Strategy," Research Paper of the Tokyo Foundation, February 2005, p. 18 (in Japanese) .
[24] Department of Defense, *Quadrennial Defense Review Report*, February 6, 2006, p. 19.
[25] Ibid, pp. 49-51.
[26] Department of Defense, *Strategic Deterrence Joint Operating Concept*, February 2004, pp. 15-17.

break from the past, and especially from the adversarial legacy of the Cold War."[27] In December 2001, the US officially notified the withdrawal from the ABM Treaty.

Expiration of the ABM Treaty means that there is no possibility that the START II Treaty will enter into force, and START I will lapse in 2009 (unless extended), signifying full departure from an institutionalized the MAD framework. Of course, a MAD situation is likely to remain between the US and Russia for at least the foreseeable future. Russian strategic nuclear forces will inevitably be reduced, yet they will still have sufficient capability to inflict unbearable damage on the US, and the US MD capability will not be able to neutralize Russian forces for some time. There is no definite answer to whether the imbalance in strategic nuclear forces between the US and Russia will become too large to maintain a MAD situation, or whether the US can create a MD capability that will largely undermine Russian strategic nuclear forces.

On the other hand, the fact that the US and Russia are no longer in a hostile relationship has diminished the possibility of strategic war, a situation that has developed further through close coordination since the 9/11 terrorist attacks. This means that there has been a transformation of strategic stability between the US and Russia, as military aspects concerning strategic weapons give way to political considerations, reducing the importance and urgency of coordinating deterrence postures and of balancing strategic forces through negotiations on nuclear arms control and disarmament.

In May 2002, Presidents Bush and Putin signed the "Joint Declaration on the New Strategic Relationship" as well as the Moscow Treaty, and declared that the US and Russia would construct a "new strategic relationship" through cooperation on a broad range of issues. This undoubtedly demonstrates a transformation of strategic stability. Of course, this transformation might have been realized even with the continuation of the ABM Treaty framework and the development of traditional strategic nuclear arms control, but its reality was more clearly shown through breaking from institutionalized MAD as well as the Bush Administration's repeated claim that the ABM Treaty was the adversarial legacy of the Cold War.

A change in strategic relations between the US and Russia from focus on military to political aspects will be favorable to international stability. Still, the US and Russia are not allies and there is no guarantee that such favorable relations between them will continue, even in the short term. The change to a new strategic relationship is founded on a coincidence of national interests; if such interests should collide in the future, then there is still a possibility that the US and Russia will fall back to an emphasis on military measures to maintain strategic stability,

[27] George W. Bush, "Remarks by the President to Students and Faculty at National Defense University," Fort Lesley J. McNair, Washington D.C., May 1, 2001 [http://www.whitehouse. ov/news/releases/2001/05/g20010501-10.html].

primarily through strategic forces. In addition, a lack of transparency in strategic forces may lead to distrust and misunderstanding between the US and Russia, thereby further degrading bilateral relations. If such a situation arises, it would be difficult to maintain strategic stability under the situation where there is no institutionalized MAD.

In the Nuclear Posture Review in 2001, the US, at least on the surface, emphasizes that Russia is no longer an enemy and explained that the scale of strategic nuclear force is not driven by an immediate contingency involving Russia. The US also stressed that MD were not aimed at Russia. However, if the relationship between the US and Russia becomes tense, the US will likely reemphasize strategic nuclear forces as well as utilize missile defense. Unless the large economic and technological gaps existing between the US and Russia are reduced, the US is likely to maintain quantitative and qualitative supremacy in strategic forces over Russia.

By maintaining MIRVed ICBMs, not only the US but also Russia can maintain strategic nuclear forces with sufficient scale to inflict unacceptable damage on each other, and may be able to rebuild such forces to a certain level. If Russian strategic nuclear forces become vulnerable to US preemptive attacks, Russia may be more motivated to use their strategic nuclear forces before being destroyed; in other words, they may threaten crisis stability. Furthermore, if there is an asymmetric situation in which the US develops both offensive and defensive strategic forces while Russia does not possess defensive forces with sufficient capability to intercept strategic nuclear weapons, Russia is likely to increase its strategic nuclear forces to overwhelm the US MD, and even heighten its alert status, further raising motives for first strike.

It is unlikely that the US and Russia would again face such an extreme situation. However, as seen in the Iraq War of 2003 and the Iran's nuclear issue since 2002, there are issues that could trigger disputes of interests. In the process of shifting toward a new strategic relationship, the US and Russia must control friction through understanding of each other's actions based on political and diplomatic prudence.

b. Toward China

At present, no one can predict relations between the US and China will evolve toward confrontation or coordination. That is why the QDR of 2006 listed China as at a "strategic crossroad." The QDR predicted that China would become an economic partner and a responsible stakeholder, while also expressing concern over military modernization that gives China the greatest potential to enter an arms race with the US.[28]

One cannot eliminate the possibility that US-China relations could develop into military

[28] Department of Defense, *Quadrennial Defense Review Report*, February 6, 2006, pp. 29-30.

confrontation over Taiwan in the short term, and hegemony over the Asia Pacific region in the mid to long term. Although competition and rivalry between the US and China can be seen in politics, diplomacy, economics and culture, the importance of military power as a way to influence each other's intentions will not diminish. In particular, deterrence based upon nuclear forces and missile defense is likely to have serious implications for the future, whether at a strategic level (between the US and China), or at a theater level (Chinese coastal areas including the Taiwan Strait).

(i) Strategic Level

The gap between the US and China on strategic forces is overwhelmingly in favor of the US. The strategic nuclear forces China deploys at present include about 20 DF-4 ICBMs (13,000 km range).[29] The US is estimated to have 4530 strategic nuclear warheads deployed on ICBMs, SLBMs, and heavy bombers, as of January 2005.[30] The US operationally deployed strategic nuclear warheads in service are to be reduced to 1700 to 2200 by the end of 2012 under the Moscow Treaty with Russia, but there is no requirement to dismantle these nuclear warheads or their delivery vehicles, and it is possible to put them back to service when needed.

China is thought to have adopted a minimum deterrence strategy which would deter nuclear attacks by having some retaliatory capability. However, DF-4 uses liquid fuel and requires fixed launchers; they are thus vulnerable to a US first strike. The US is deploying 20 Ground-Base Midcourse Defense (GMD) missiles to Fort Greeley in Alaska and Vandenberg in California to defend the US homeland from long range ballistic missiles. Even though these missiles are still at a test stage and have limited capabilities, they could intercept the few DF-4s that survived a US first strike. Under such conditions, China might not even be able to attack the US homeland, let alone possess a minimum level of deterrence against the US.

Since the 1980s, China has worked to modernize its nuclear forces, mainly its ground based ballistic missiles. China has developed DF-31 (8000 km), and DF-31A (12000km) ICBMs that use solid fuel and mobile launchers. DF-31 may also be converted to the JL-2 SLBM. The US estimates that China will have 75 to 100 strategic nuclear warheads by 2015.[31] With the improved survival rate of such missiles, China will likely recover a minimum deterrence capability.

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[29] For China's ballistic missiles, see Robert A. Manning, Ronald Montaperto and Brad Roberts, *China, Nuclear Weapons, and Arms Control: A Preliminary Assessment*, Chairman's Report of a roundtable jointly sponsored by the Council on Foreign Relations, the National Defense University, and the Institute for Defense Analyses, pp. 19-26; Shirley A. Kan, "China: Ballistic and Cruise Missiles," *CRS Report for Congress*, 97-391F (updated August 10, 2000), pp. 1-16.

[30] Robert S. Norris and Hans M. Kristensen, "U.S. Nuclear Forces, 2005," *Bulletin of the Atomic Scientists*, Vol. 61, No. 1 (January/February 2005), pp. 73-75.

[31] Unclassified Summary of a National Intelligence Estimate, *Foreign Missile Developments and the Ballistic Missile Threat Through 2015*, December 2001. [http://www.cia.gov/nic/pubs/other_products/Unclassifiedballisticmissilefinal.htm].

However, it is doubtful that the US will tolerate China's capability to carry out nuclear attacks on the US homeland. China's strategic nuclear forces are extremely limited compared to those of the Soviet Union. Moreover, the US has improved its MD capabilities. The Bush Administration has claimed that the US MD will not be a threat to China.[32] However, there is the argument that the US should promote MD not only to deter China, but to prevent the US from being deterred by China.[33] It is unlikely that the US would refrain from directing more capable MD forces against China. In that case, the US may establish a denial capabilities that would effectively neutralize China's strategic nuclear forces.

Loss of a minimum deterrence capability means that China would no longer be able to deter US intervention in Taiwan through retaliatory attacks on the US,[34] and lose its status as one of few major powers with capability to threaten the US homeland. This situation is something China can never ignore. If the US aims to establish deterrence by denial toward China, China must introduce some countermeasures. These could include: accelerated build-up of ICBMs and SLBMs, addition of MIRV warheads, or adoption of Maneuverable Reentry Vehicle (MaRV), as well as decoys.[35] On the other hand, increasing its missile inventory could obstruct China's economic development, its highest priority, so this could limit a missile build-up.

Considering the future deterrence relationship between the US and China in simplified terms, it depends on the US MD development versus China's capability to increase strategic missiles. If the interception capabilities of US MD forces are limited, or China has a sufficient number of strategic missiles to overcome US missile defense networks, China can at least secure minimum deterrence. Unlike the case where both countries only possess offensive forces, the situation in which the US deploys defense capabilities may complicate the strategic calculations of both countries.

(ii) Theater Level

Whatever a deterrence relationship at the strategic level is established between the US and China, it is not likely that China will surrender to the US at the theater level. Loss of capability to

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[32] For example, "U.S., China to Discuss Missile Defense," Statement by the Press Secretary, Office of the Press Secretary, The White House, Washington, DC, September 4, 2001 [http://www.state.gov/t/ac/rls/rm/2001/4803.htm]; Elisabeth Rosenthal, "American Aide Meets Chinese on U.S. Pullout from ABM Pact," *The New York Times*, December 18, 2001 [http://www.nytimes.com/2001/12/18/international/asia/18CHIN.html].

[33] See Richard D. Fisher, Jr. and Baker Spring, "China's Nuclear and Missile Espionage Heightened the Need for Missile Defense," *Backgrounder*, The Heritage Foundation, No. 1303 (July 2, 1999); Leon Sloss, "Deterrence, Defenses, Nuclear Weapons and Arms Control," *Comparative Strategy*, Vol. 20, No. 5 (2001), p. 438.

[34] Remarks of Chas. W. Freeman, former Assistant Secretary of Defense to Chinese officials in 1996. (*Foreign Policy Alert*, No. 26 (October 9, 1996) [http://afpc.org/fpa/fpa26.htm])

[35] China has shown interest in countermeasures against missile defense since the 1960s and is said to be proceeding with research and development. See Ballistic Missile Defense Organization (BMDO), "Country Profiles: China," BMDO Countermeasure Integration Program, April 1995.

ensure its position in East Asia, particularly on Taiwan and resources in littoral seas, would seriously damage China's national interests. If there is a probability that China could be deterred by the US at a strategic level, China would react by concentrating its resources for building up theater and tactical nuclear forces.[36]

China's nuclear-armed SRBMs and MRBMs use solid fuel and mobile launchers. They are highly survivable from surgical strikes and their accuracy is thought to be relatively high. China aims to acquire countervalue as well as counterforce capabilities, thereby deterring not only nuclear but also conventional attacks. China is reportedly seeking a limited deterrence capability, which would control the escalation of conventional conflicts to nuclear war.[37] Targets for China's ballistic missiles could include the bases of the US Forces in Japan, and the US naval forces deployed near Japan. China has imported many weapons from Russia, including SU-27 and SU-30 fighter jets, Sovremenny class destroyers, and Kilo class submarines. These are also aimed to prevent the US intervention in conflicts on the seas near China.

US capabilities that can oppose China at the theater level world include SLCMs and precision guided munitions as counterforce capabilities, and missile defense. Considering the progress of China's modernization of SRBMs and MRBMs, it may be difficult to entirely neutralize these forces. However, even certain level of damage limitation capability may prevent China from deterring the US. It would also lower the possibility that China could undermine the US credibility of extended deterrence for its allies.

At the theater level, the deterrence relationship between the US and China will become more complicated than that at the strategic level. Both the US and China already have levels of missile capabilities that cannot be neutralized by the other. Both are trying to maintain denial capabilities, so that if Japan (and Taiwan) deploys missile defense systems, calculations related to deterrence will get even more complicated. This fact may restrain a deterioration of US -China relations. On the other hand, it could also raise motives for first strike. In this case, there is an even higher probability that both countries could be drawn into an arms race at the theater level to establish a more advantageous deterrence posture.

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[36] About the countermeasures China is expected to take, see David M. Lampton and Gregory C. May, *A Big Power Agenda for East Asia: America, China, and Japan* (Washington D.C.: The Nixon Center, 2000), pp. 47-49; Paul H.B. Godwin, "Potential Chinese Responses to US Ballistic Missile Defense," *Report*, The Henry L. Stimson Center, No. 43 (January 2002), pp. 3-9.

[37] Regarding limited deterrence, see Alastair Iain Johnston, "China's New 'Old Thinking': The Concept of Limited Deterrence," *International Security*, Vol. 20, No. 3 (Winter 1995/96), pp. 5-42. A shift toward limited deterrence will require the modernization and build-up of nuclear forces including improvements in precision and survival. Also it is essential to strengthen command, control, communication and information (C3I) as well as early warning systems. See Paul H.B. Godwin, "PLA Doctrine and Strategy: Mutual Apprehension in Sino-American Military Planning," prepared for *The PLA and Chinese Society in Transition*, a conference sponsored by the National Defense University, Washington D.C., October 30-31, 2001 [http://www.ndu.edu/inss/China_Center/PGodwin.htm]

3. Deterrence Posture for Japan's Ballistic Missile Defense

1) Traditional Deterrence Posture of Japan

Article 9-1 of Japan's Constitution states that "[a]spiring sincerely to an international peace based on justice and order, the Japanese people forever renounce war as a sovereign right of the nation and the threat or use of force as means of settling international disputes." However, it has been interpreted that the Constitution allows the exercise of minimum force for self-defense.[38] In addition, Japan maintains exclusively defense-oriented policy based on the spirit of the Constitution by limiting defense forces to a necessary minimum, while using force only in the situation where there is no appropriate means to deal with this aggression other than resort to the right of self-defense.[39] The 2005 National Defense Program Guideline stated that "[t]he first objective of Japan's security policy is to prevent any threat from directly reaching Japan and, in the event that it does, to repel the threat as well as to minimize the damage."

This exclusively defensive-oriented policy is based on defensive deterrence by denial. According to the Japanese Government's interpretation, offensive denial capabilities, which include surgical strike against opponent's missile bases, would be permitted under the right of self-defense, as long as there are no other feasible defense measures.[40] In reality, however, Japan has not possessed such capabilities.

Moreover, Japan's Constitution has been said to prohibit the possession of weapons that can enable deterrence by punishment, such as ICBMs, long-range strategic bombers, and attack aircraft carriers. This is because Article 9-2 prohibits capabilities beyond defense powers of minimum necessity; so-called offensive weapons, used only to inflict destruction of an enemy's land, naturally fall outside the minimum force necessary for self-defense.[41] In regards to nuclear weapons, the Government has interpreted that any nuclear weapons classified to be within the scope of minimum necessary self-defense are permissible,[42] but the Government has also adopted the three non-nuclear principles of "not possessing nuclear weapons, not producing them and not permitting their introduction in Japan." Japan is a non-nuclear-weapon state party to the NPT, thereby formally renouncing the right to possess nuclear weapons under the international law.

Undoubtedly, such policies of renouncing the right to possess WMD, including nuclear weapons,

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[38] "Written answers to the questions by Representative Kiyoshi Mori", December 5, 1980.
[39] "Written answers to the questions by Representative Yutaka Hata," November 15, 1985. , November 15, 1985
[40] Answers by Prime Minister Ichiro Hatoyama (read by Naka Funada, Director-General of the Defense Agency) at the Cabinet Committee of the House of Representatives, February 29, 1956.
[41] Answer of Tsutomu Kawara, Director-General of Defense Agency at the Budget Committee of the House of Councilors, April 6, 1988.
[42] Answer by Reijiro Tsunoda, Director-General of Cabinet Legislation Bureau, at the Budget Committee of the House of Councilors, April 5, 1982.

and ballistic missiles were set without reflecting on the serious threats to Japan of nuclear weapons and ballistic missiles. Yet, Japan is now facing such threats. As stated above, there are several countries in Northeast Asia possessing or capable of possessing such weapons. Japan recognizes the existence of real and potential threats from countries such as North Korea, China and Russia. With a narrow width of land and concentrated population and industries, Japan is especially vulnerable to nuclear attack and intimidation.

To deter such threats, Japan, in alliance with the US through the Japan-US Security Arrangement, relies on extended deterrence provided by the US. Japanese Defense Guidelines of the past continuously reaffirmed that against threats of nuclear power Japan will rely on nuclear deterrence of the US. The 1997 "Guidelines for Japan-US Defense Cooperation" confirmed that Japan Self-Defense Forces (SDF) are to operate mainly in and around Japan, while the US Forces support the SDF and conduct complementary operations that would include exercising offensive power. This means that Japan is largely dependent on the US capabilities even for deterrence by denial to attack opponent's military based including ballistic missile ones (offensive defense).

As seen here, Japan has maintained deterrence by possessing independent capabilities for defensive deterrence by denial, while relying on the US for deterrence by both denial and punishment.

2) Japan's Deterrence Posture against Ballistic Missile Threats

Today's security environment surrounding Japan is rapidly changing with the proliferation of nuclear weapons and ballistic missiles in Northeast Asia. Japan is thus forced to change its deterrence posture.

Japan's introduction of BMD will undoubtedly strengthen its defensive deterrence by denial as long as Japan can procure sufficient capabilities in quality as well as quantity. Of course, BMD systems cannot guarantee a 100 % success rate in intercepting ballistic missiles, but they can restrict an enemy's capabilities to attain political and military advantage through actual or threatened ballistic missile attacks, while complicating his strategic calculation. If there are increased uncertainties in achieving of the goal by using ballistic missile, an enemy will be more cautious in considering such actions. In addition, effective BMD may restrain increases and proliferation of ballistic missile inventories.

To strengthen deterrence by denial through BMD, one needs to get an enemy to recognize that the BMD system can intercept ballistic missiles effectively. Japan should continuously improve the effectiveness of BMD systems while demonstrating their capabilities through tests and exercises. However, BMD as an active defense measure by itself would not provide sufficient deterrence against ballistic missile attacks. As mentioned before, BMD systems cannot be completely

effective in intercepting hostile missiles. Japan needs to combine BMD with other measures to lessen the threat of ballistic missiles, thereby building stable and powerful deterrence.

For example, Japan needs to contemplate deterrence by denial through offensive defense capability. If an enemy is preparing to attack Japan with ballistic missiles, preemptive attacks on ballistic missile bases will undoubtedly lessen potential damage to Japan. Moreover, such action may increase the possibility of a BMD system intercepting ballistic missiles unharmed by attacks on their bases. In this way, the combination of offensive and defensive systems may have a synergy effect on deterrence by denial. It would be preferable to have more politically controllable capabilities such as precision guidance weapons.

Even if ballistic missiles avoid interception and hit Japan, it is still possible to take appropriate damage confinement measures as part of passive defense. Such damage confinement measures may enhance the effects of defensive deterrence by denial. Establishment of the Law to Protect Citizens is the first step toward such confinement measures, and its implement is needed. ［Offensive defense and passive defense will be further discussed in Chapters 10 and 11］

To strengthen the overall deterrence of Japan against ballistic missile attacks, it is necessary to consider deterrence by punishment in addition to the development of deterrence by denial discussed above. In this respect, the deployment of effective BMD by Japan will benefit to the reinforcement of the extended deterrence provided by the US. The key is the relationship between the US and Japan, as well as the damage confinement capabilities of both the provider and recipient of extended deterrence.

If the US, the provider of extended deterrence to Japan, has considerable damage confinement capability—such as an effective MD system—there is a higher probability of the US absorbing punishment attacks, raising the credibility of its extended deterrence. The US MD readiness will thus lessen the possibility of the US abandoning Japan. In addition, if Japan develops its BMD capabilities further, an enemy will need to plan on a greater scale of attacks for achieving its objectives,which would in turn increase the likelihood of the US retaliation, thus deterring attacks on Japan.[43] Japan's BMD system will also provide a degree of response against ballistic missile attacks on the US bases in Japan, so complementing the US damage confinement capabilities. The information sharing between Japan and the US through BMD systems will contribute to the missile defense of the US homeland, which will further lessen the vulnerability of the US, and thus the credibility of the US extended deterrence.

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[43] Tetsuya Umemoto, "Lecture at Japan-US Ballistic Missiles Defense Seminar", *Gekkan Nippon Special Edition*, April 2002, p. 71 (in Japanese) .

Japan and the US can build an even closer relationship through BMD. BMD operations in Japan will need much closer cooperation with the US. By strengthening the capability of Japan to confine damage from ballistic missile attacks, Japan can decrease the possibility of surrendering to intimidation that could lead to denying cooperation with the US. Effective BMD cooperation would also mitigate concerns that Japan will be involved into the US conflicts with others, and reduces the possibility of "decoupling" Japan and the US. Closer relationship between Japan and the US will heighten the importance of Japan as a key ally to the US, and further increase the credibility of the US extended deterrence in case of crisis in Japan.

Since May 2006, North Korea has taken provocative postures and countries such as China attempted dissuasion diplomacy. However, North Korea conducted ballistic missile launches in early July. Lack of sufficient denial capabilities such as BMD on the part of Japan and the US might have been a factor in the North Korean actions. It certainly proved the limited effect of diplomacy without power to support it. If Japan and the US develop denial power that also increases the credibility of the US extended deterrence to Japan, reckless behavior by North Korea as well as intimidation with political intentions can be deterred more effectively.

Furthermore, if North Korea realizes that missile attacks will not be effective due to BMD as well as offensive and passive defense measures by Japan and the US, North Korea would dissuade to implement such attacks. North Korea places highest priority on continuation of the current regime. If there is an increased probability that the US will conduct military operations against North Korea which attacks on Japan, then it will likely result in the collapse of North Korea's regime. In this way North Korea's attacks on Japan will be deterred.

One reason why China expressed strong concerns over the introduction of BMD to Japan is the fundamental change it has on the characteristics of the Japan-US alliance. Through introduction of BMD, the Japan-US alliance has become closer than ever, which may hinder China's efforts to weaken the influence of the US in the region. Moreover, the shift of Japan-US alliance from defense to regional stability will be accelerated. China have concerned that the defense powers of Japan may be used to respond to conflicts over Taiwan and the South China Sea.[44] If Japan with the US bases is to deploy effective BMD, it will be especially difficult for China to force Japan to stop the support for the US simply by intimidation of possible ballistic missile attack. Moreover, if Chinese ballistic missile attacks on the US bases in Japan can be neutralized by BMD, China, which may seek a limited deterrence strategy, will have difficulty in controlling conflict

[44] See Michael R. Chambers, "Rising China: A Threat to Its Neighbors?" Carolyn Pumphrey(ed.), *The Rise of China in Asia:Security Implications (Carlisle,PA: strategic Studies Institute,2002)*, pp. 74-75.

escalation.[45]

As mentioned before, introduction of BMD to Japan may complicate theater and tactical level deterrence between the US and China, and accelerate China's build-up of MRBMs. However, such action would highlight the inconsistencies of China's nuclear policies. China declares an unconditional negative security assurance toward non-nuclear-weapon states. This means that China does not use or threaten to use nuclear weapons against Japan. If China increases MRBM capabilities in reaction to Japan's introduction of BMD, that would increase the suspicion that China in reality maintains the option of nuclear attacks on Japanese territories, including US bases in Japan.

If Japan's deterrence has greater credibility due to the introduction of BMD and improvement of extended deterrence, pressure on Japan to develop its own nuclear attack capabilities will be lessened. Currently, Japan has the technological potential to manufacture nuclear weapons and ballistic missiles, which may make other countries cautious in their actions. On the other hand, such potential could invite suspicion of Japan's intentions on the development of nuclear weapons. Japan's going nuclear would undoubtedly have unfavorable effects on the security environment surrounding Japan, including arms race in the region. The strengthening of BMD and extended deterrence may avoid tension over nuclear weapons development, and allow Japan to maintain its three non-nuclear principles, as well as its disarmament and non-proliferation policies.

BMD will strengthen Japan's denial capabilities. By developing an appropriate system to defend against ballistic missile attacks, Japan can lessen its vulnerability and demonstrate its will not to surrender to intimidation. This will also enable Japan to maintain rational decision-making even in the face of crises. However, technological limitations of BMD and budget constraints will likely prevent the completion of a deterrence posture in Japan. That is why it is necessary to make the deterrence systems more stable and effective through not only BMD as an active defense measure, but also the integration of other measures included in the 5Ds described above.

[45] In regard to the reasons why China opposes Japan-US NTWD cooperation, see Kaori J. Urayama, "Chinese Perspectives on Theater Missile Defense: Policy Implications for Japan," *Asian Survey*, Vol. XL, No. 4 (July/August 2000), pp. 600-607; Michael Swaine, Rachel Swanger and Takashi Kawakami, *Japan and Ballistic Missile Defense* (Santa Monica: RAND, 2001), pp. 79-80.

Chapter 10　Offensive Defense Measures

1.　Necessity of Offensive Defense Measures

In December 2004, Japan made a decision to introduce BMD as an active defense measure against ballistic missile attacks.　However, Japan still did not have BMD capability at the time of North Korea's ballistic missile launches in July 2006.　Japan's BMD system is still under development, at the initial stage in a spiral approach to acquiring this capability.　Even if more effective BMD capabilities are developed in the future, military common sense says that completely successful interception will be unlikely.　Ballistic missiles with WMD warheads, especially nuclear weapons, which evade interception will likely inflict tremendous damage.　Thus, attacks on enemy ballistic missile bases as a measure of offensive defense would be effective in reducing or eliminating the threat of such missiles.

Under the Japan-US Security arrangement, the US will take the role of "offensive defense" to defend Japan.　The 1997 Guidelines for Japan-US Defense Cooperation emphasize that Japanese Self-Defense Forces (SDF) and US Forces would have to cooperate closely on BMD operations; US Forces are to deploy units with attack capability and take the lead in carrying out attacks on ballistic missile bases when necessary.　However, if US Forces are operating in other regions, or do not have sufficient power for strike operations, the US will likely expect Japan to share this role. Also there may be some possibility that the US will refrain from preemptive attacks on missile launch sites to defend Japan.

In such situations Japan would need to remove immediate threats on its own.　To respond to changes in its security environment and develop longer term defense power, Japan should clearly demonstrate its will to develop offensive capability against opponent's missile launch sites. However, Japan has never developed such capability because of its so-called "exclusively defense-oriented policy."　Thus various policy issues need to be solved for the SDF to move toward such capability, which will in any case take many years to implement.　Until then, Japan needs to support US Forces it relies on to attack missile launch sites.　Japan also needs to study joint operations with US Forces to develop surgical strike capability, and develop the technical competence of Maritime and Air SDF personnel in anticipation of acquiring such capability.

2.　Offensive Defense and BMD

1)　Significance of Offensive Defense

Offensive defense measures to attack missile launch sites were one of the most important means to limit damage from ballistic missile attacks before BMD technologies established.　During the Cold War, one of main missions for the US ICBMs was counter-force against Soviet military targets, especially its ICBM forces.　The US continued to emphasize counter-force in its operations even after the adoption of Assured Destruction strategy based on counter-value, which

is to attack cities and industrial infrastructure.[1] The US tried to improve counter-force capability by increasing the accuracy of ICBMs and adding the prompt hard-target kill capability, so to increase effectiveness against enemy ICBM silos.[2]

Japan's BMD system has been technologically proven but is still in development, so it may not have sufficient capability against an enemy ballistic missile force qualitatively or quantitatively. Therefore, for the foreseeable future, attacks on ballistic missile launch sites will be essential as an offensive defense measure just as BMD is needed as an active defense measure. If BMD capabilities can be developed to effectively intercept ballistic missile threats under every conceivable condition, there may be less urgency in attacking missile launch sites. However, this would not lower the significance of such offensive defense measures.

As mentioned before, no matter how advanced BMD capability may become, it will not have a 100% probability in intercepting ballistic missiles; this is an inherent limitation of defensive weapons. Moreover, if such the capability of a BMD system is restricted to the interception of incoming ballistic missiles, opponents can launch ballistic missiles again from the same launch sites. By developing the means to attack missile launch sites, it will become possible to limit an enemy's ability to make further ballistic missile attacks. Moreover, continuous attacks on ballistic missile launch sites will restrict enemy operations, possibly reducing the number of ballistic missiles launched. "Suppressive effect" of offensive defense was seen during the Gulf War in 1991.[3]

If it is possible to decrease the number of incoming ballistic missiles, BMD will have much more margin for operation. Considering the fact that costs for BMD system are much higher than that of ballistic missile targeted, attacks on missile launch sites can also benefit the efficient use of valuable BMD resources. Offensive defense measures to attack missile launch sites can complement active defense through BMD, thereby enabling more effective response against ballistic missile attacks.

2) Examples and Lessons of Offensive Defense

Since the emergence of air power, air strike operations aimed at disabling an adversary's capabilities have been carried out with considerable success. Various sensors and air defense

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[1] See Desmond Ball, "The Development of the SIOP, 1960-1983," Desmond Ball and Jeffrey Richelson (eds.), *Strategic Nuclear Targeting* (Ithaca: Cornell University Press, 1986), p. 70; Eric Mlyn, *The State, Society, and Limited Nuclear War* (New York: State University of New York Press, 1995), pp. 55-83.

[2] See "Press Conference of U.S. Secretary of Defense," National Press Club, Washington D.C., January 10, 1974, reprinted in P. Edward Haley, David M. Keithly and Jack Merritt (eds.), *Nuclear Strategy, Arms Control, and the Future* (Boulder, Colorado: Westview Press, 1985), pp. 94-100; Harold Brown, "Nuclear War Strategy, PD-59," statement before the Senate Foreign Relations Committee, September 16, 1980, reprinted in Haley, *et al*, *Nuclear Strategy, Arms Control, and the Future*, pp. 101-107.

[3] Sugio Takahashi, "Coping with a Ballistic Missile Threat: Strike Capability under an Exclusively Defense-Oriented Policy," *Boei Kenkyujo Kiyo*, Vol. 8, No. 1 (October 2005), p. 113 (in Japanese) .

weapons have also been developed in response to such strikes. Advancements in military technologies have further heightened the capabilities of both offense and defense and combat is now undertaken using not only traditional air power, but also with precision-guided weapons in highly advanced electronic environments. Currently the operational form of offensive ground warfare is usually a strike package, which the US adopted during the Gulf War in 1991. The strike package consists of air units with functions including ① accurate location of ground targets; ② Suppression of Enemy Air Defense (SEAD); ③ precision bombing. Attacks on ballistic missile launch sites would be based on use of a strike package combined with cruise missiles for stand-off precision attacks.

At the time of the Gulf War, the US conducted massive "Scud hunts" using strike packages. Although such operations did not destroy whole of the Iraq's Scud forces, it succeeded in greatly reducing the number of Scud launches. This undoubtedly proved the effectiveness of offensive defense measure in reducing enemy ballistic missile attacks. However, since Iraqi Scuds used mobile launchers, it was extremely difficult to detect, identify, and target the launchers, leaving many issues for future resolution.

From the lessons learned during the Gulf War, the US developed the concept of Network-Centric Warfare (NCW) using modern information technologies (IT). The US was able to refine this concept through experience in the Kosovo air strikes, anti-terrorism operations in Afghanistan, and the Iraq War. The sensor-to-shooter time (that required from acquiring target information to issuing attack orders) was reduced from up to several days during the Gulf War, to several hours during the Afghan War, to several tens of minutes during the Iraq War through the use of time sensitive targeting enabled by NCW and precision guided munitions. In this way, a command to attack new targets or change targets can be sent in almost real time to aircraft already in the air. As a result, the destruction rate of mobile launchers is greatly improved. During the Iraq War, 46 of about 80 or about 55% of Iraq's mobile launchers were destroyed.

Sensor-to-shooter time could be shortened to seconds in a future war, so offensive defense measures may become still more effective against mobile launchers. The No Dongs of North Korea that directly threaten Japan use mobile launchers, so there has been some doubt on the effectiveness of attacking missile launch sites because of tremendous difficulties in finding and accurately striking such mobile sites. However, development of ground attack systems using current technological standards would assure the effectiveness of attacks on missile launch sites.

The US is accelerating efforts for a Global Strike program to quickly neutralize hostile military

facilities with WMD, ballistic missiles, and command and control systems.[4] The Global Strike is considered a key element of the US strategy to build active and multi-layered defense in depth against threats of WMD and/or ballistic missiles as far away as possible from the US homeland.[5] The Global Strike emphasizes strengthening the capabilities of conventional forces (conventional Global Strike).[6] Some SLBMs and ICBMs of the US are to be converted to the conventional missions as an initial capability. They could carry out precision conventional attacks within one hour of a decision. On the other hand, their use risks the possibility that Russian early warning systems could mistake them for strategic nuclear attacks against Russia. To reduce such risks, the US is considering measures to provide transparency in the operation of such systems and confidence-building measures (CBM) that include notification of missile launches.[7]

3. Japan's Policy toward Offensive Defense

In the past, Japan had no capability to implement offensive defense measures, although the Japanese Government has stated that such capabilities would not infringe upon Japan's Constitution and the principles of its national security policies. Under the current Constitution, Japan sets its fundamental defense policy as exclusively defense-oriented, determines security policies on that principle, and maintains minimum forces required for self-defense. Exclusively defense-oriented policy has been defined as the posture of defense strategy in passive manner that is consistent with the spirit of the Constitution so to exercise defense power only when armed attack is initiated, and to possess defense power limited to minimum required for the purpose of self-defense.[8] Minimum defense power has been interpreted as one that varies depending on the prevailing international situation, the standards of military technology and various other conditions, but it is unconstitutional to possess what is referred to as offensive weapons that, from their performance, are to be used exclusively for total destruction of other countries, since it immediately exceeds the limit of the minimum necessary level of self-defense. Therefore, the SDFcannot possess, for example, ICBMs, long range strategic bombers, or attack aircraft carriers.

However, such interpretations of the Constitution and fundamental national security policy do not necessarily deny the implementation of offensive defense measures in attacking ballistic missile

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[4] In regards to the Global Strike, see Hans M. Kristensen, *Global Strike: A Chronology of the Pentagon's New Offensive Strike Plan* (Washington D.C.: Federation of American Scientists, 2006).

[5] Chairman of the Joint Chief of Staff, *National Military Strategy to Combat Weapons of Mass Destruction*, 13 February 2006.

[6] For conventional global strike, see Peter C.W. Flory, Assistant Secretary of Defense, International Security Policy, "Statement," Before the Strategic Forces Subcommittee, Senate Armed Services Committee, March 29, 2006; James E. Cartwright, Commander, United States Strategic Command, "Statement," Before the Strategic Forces Subcommittee, Senate Armed Services Committee, March 29, 2006.

[7] In regards to the conversion to conventional global strike by Trident SLBM, see Flory, "Statement"; Charles B. Young, Director, Strategic System Program, "Statement," Before the Subcommittee on Strategic Forces of the Senate Armed Services Committee, March 29, 2006; Cartwright, "Statement". The Quadrennial Defense Review of 2006 also recommended to shift of Tridents to conventional services.

[8] See the web site of the Japan's Ministry of Defense[http://www.mod.go.jp/e/defense_policy/japans_defense_policy/index.htm].

launch sites directed toward Japan. In February 1956, the Government of Japan made a statement on this matter that it was not in the spirit of the Constitution to sit and wait to be destroyed, and that when no other means were available, it was lawful to attack enemy bases that possess guided missiles.[9]

In reality, however, Japan has no weapons capable of attacking enemy ballistic missile launch sites. During the Cold War, such threats to Japan came mostly from the Soviet Union, but attacks on the Soviet Union were left for US Forces under the Japan-US Security arrangement. The share of roles between Japan and the US, in which US Forces were to conduct attacks on enemy bases to defend Japan, was reconfirmed under the 1997 Guidelines for Japan-US defense cooperation. Moreover, Japan's National Defense Program Guideline (NDPG) does not include attacks on enemy territory as a role for Japan's SDF, and JDA (now Ministry of Defense)'s Mid-Term Defense Program (MTDP) does not include the development of capability to attack enemy territories including ballistic missile launch sites.

North Korea's launch of a Taepo Dong 1 ballistic missile in August 1998 and its admission of nuclear weapon development activities in October 2002 accelerated the reconsideration of such policies. North Korea possesses missiles with WMD, and are said to have deployed about 200 No Dong missiles that can cover the entire area of Japan. Realizing the fact that threats has grown rapidly fueled the argument that Japan should seriously consider the capability to attack missile launch sites in response to such threats.

In March 1999, then JDA Director-General Norota confirmed that armed attacks occur not only when Japan suffers damage but also when an invading country initiates to prepare for armed attacks, and that if there is no other measure to defend from attacks such as those of guided missiles, to attack an enemy's guided missile bases is within the legal right of self-defense.[10] In addition, former JDA Director-General Ishiba told the Diet in January 2003 that if an opponent expressed a desire to make Tokyo a "sea of fire" and initiated preparations for ballistic missile launches, it can be construed as the start of an armed attack.[11] The following March, he also stated that offensive defense measures would be "worthy of review."[12] The 2005 NDPG and associated MTDP did not clearly discuss offensive defense measures against ballistic missile launch sites, but stated that "response to invasion against outlying islands" as one of "new threats and various situations" requiring response by Japan. The new MTDP also stated intent to

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[9] Answer of Prime Minister Ichiro Hatoyama (read by Director-General of the Defense Agency, Naka Funada) at the Cabinet Committee of the House of Representatives, February 29, 1956.
[10] Answer of Hosei Norota, Director-General of the Defense Agency, at the Security Committee of the House of Representatives, March 3, 1999.
[11] Answer of Shigeru Ishiba, Director-General of the Defense Agency, at the Budget Committee of the House of Representatives, January 24, 2003.
[12] Answer of Shigeru Ishiba, Director-General of the Defense Agency, at the Security Committee of the House of Councilors, March 27, 2003.

acquire air-to-air refueling and transport aircraft (KC-767) and fighter jets (F-2). The F-2s can be armed with Joint Direct Attack Munitions (JDAM), conventional bombs with precision guidance. Such capabilities can be used to attack ballistic missile launch sites.

North Korea's missile launches in July 2006 prompted further discussion on offensive defense measures. JDA Director-General Nukaga stated that it is natural for an independent country to think of having minimum defense capability within a certain framework, indicating the need for capabilities to attack enemy missile launch sites. Chief Cabinet Secretary Abe also commented on the need to develop a rationale on missile launch site attacks within the role-sharing of the Japan-US Alliance. On the other hand, both ministers and the Government of Japan itself noted that discussion on such matters should be proceeded with caution. While there were some arguments opposing the comments of both ministers, these failed to distinguish between "preventive attacks," "preemptive attacks" and "counter-attacks" on missile launch sites, and even argued against preemptive and counter-attacks which are allowed as an inherent right of self-defense. On the other hand, some arguments making more allowance for preemptive attacks did not include actual requirements for such attacks. Arguments such as how to maintain proper counter-attack capability were not fully developed. As such, discussion in Japan of possible attacks on enemy missile launch sites is rather immature and underdeveloped.

4. Significance of Japan's Possession of Offensive Defense Measures

While Japan currently lacks any meaningful offensive defense measures to attack ballistic missile launch sites, acquisition of such capability will have significant impact on national strategy and military power.

1) Strategic Significance

Among 21st Century threats are sudden, unexpected attacks that bring massive destruction, such as the 9/11 terrorist attacks. Countries or non-state actors such as international terrorist groups which are not hesitated to resort to such attacks may not be deterred by punishment based on retaliation. As described before, the US is trying to strengthen deterrence as well as defense in case of deterrence failure by combining both offensive and defensive measures under a new strategy of deterrence by denial. Given this new security environment, Japan should not be overly dependent on the extended deterrence provided by the US as it was during the Cold War, but build a new strategy of its own.

As Japan is facing a threat of ballistic missile attack from North Korea, it needs to seriously consider possessing offensive defense measures, based on precision-guided conventional weapons, for compensating the lack of geographical depth of defense. It is undoubtedly important to prevent the rise of crises through non-military measures, as seen in present efforts to solve the North Korean nuclear problem through the Six-Party Talks. Yet, as clearly demonstrated by the

actions of North Korea, it is not possible to prevent the proliferation of WMD or ballistic missiles solely by diplomatic measures (dissuasion diplomacy). Therefore, it is essential to have a reliable hard response, in other words a military response, which can neutralize the effects of possessing WMD or ballistic missiles.

The presence of credible military capabilities would not only provide deterrence for Japan but also support non-military measures such as diplomacy. Japan, the US, and South Korea differ in their interests on North Korean nuclear and missile issues. Taking advantages of such differences, North Korea has attempted to distance the US and South Korea or Japan and the US. Already, South Korea is increasingly inclined to take actions differing from Japan and the US, due in part by the Roh Moo-hyun Administration's policies and attitudes toward North Korea. Moreover, North Korea uses concern over the abduction of Japanese citizens as a diplomatic card against Japan, and has attempted to shake up the relationship through summit meetings with Japanese political leaders. North Korea may also attempt to intimidate Japan by using its ballistic missile card to split a close Japan-US relationship and obstruct Japan-US diplomatic efforts. Japan's possession of credible military measures would support the proper diplomacy without surrendering North Korean maneuvers and intimidation.

Japan's efforts to introduce BMD and start serious discussion on offensive defense measures may have made Japanese diplomacy more effective in responding to the North Korean missile launches of July 2006. China and Russia agreed to the UN Security Council resolution strongly condemning North Korea because they wanted to take an initiative in restricting North Korea's movement toward WMD and missiles, but also because China, in particular, was wary of Japan developing a more active security policy.

On the other hand, the North Korean nuclear issue is hardly progressing through the Six-Party Talks because of historically friendly relations between China and North Korea, South Korea's appeasing attitude toward North Korea, and an interplay of strategic interests between the US and China. Japan wanted to be involved in such strategic dialogue but has not been able to actively participate, partly because of negative factors from its past but also because Japan has been unable to present distinct arguments of its own.

If Japan wants to take an initiative to resolve North Korean issues comprehensively, including nuclear, ballistic missile, and abduction matters, it must have sufficient influence on security concerns. For this Japan needs military capability to support diplomatic negotiating power. Since Japan refuses to possess nuclear weapons, it must have a level of denial capability that will allow it to withstand intimidation by surrounding countries. This could have Japan play a more active role in resolving strategic issues. Here Japan can find strategic benefit in having offensive defense in addition to BMD capability.

2) Significance from the Military Point of View

Japan is directly exposed to the threat of North Korean ballistic missiles. Depending on future developments on the Korean Peninsula, such threats could suddenly and rapidly grow. It will take a long time for BMD capabilities to reach a level of neutralizing such threats. Considering this situation, offensive defense measures against enemy missile launch sites is the only effective response, at least for the moment.

As stated before, the principle of Japan's defense policies has been exclusively defense-oriented. But from a purely military rationale, it is preferable to destroy an enemy's capability before taking damage and casualties. A posture of waiting for attacks is clearly a worst option, and the least cost-effective. If an enemy has clearly expressed the intention to attack Japan and begun preparations for ballistic missile launches, the best and most effective defense is to attack those missile launch sites before enemy operations can materialize.

Even after the first wave of missiles have been launched, attacks on launch sites to prevent subsequent missile attacks would be effective to minimize damage and make BMD operations more effective. It is also noteworthy that advances in military technologies such as precision guided weapons have made it possible to attack specific military targets, such as ballistic missile launch sites, while minimizing collateral damage.

5. Issues concerning Japan's Offensive Defense Measures

1) Issues related to International Law

Among the issues Japan needs to address in introducing offensive defense measures is legitimacy under international law. The following paragraphs consider the implications of legal concerns in each step of exercising offensive defense measures.

a. Counter Attacks

Counter attacks on the sources of hostile actions is clearly within the exercise of self-defense right under international law. Hardly any other country questions the exercise of offensive operations for counter-attacks as part of its defense policy. In Japan, however, this has been an issue for its exclusively defense-oriented policy partly because of restraint on actions in enemy territory, which Japan has imposed on itself. Discussion in Japan has thus been far remote from common sense, let alone concepts of international law.

b. Preemptive Attacks

Preemptive attacks are those made upon clear evidence of imminent attack from an enemy. Under international law, if there is a clear evidence of imminent attack such as statements of intent and preparation for such attacks, preemptive attacks are permissible as a part of

self-defense inherent in the rights of a sovereign nation.

In recent years, there has been much discussion on the concept of preemptive actions contained in the US National Security Strategy (NSS) in September 2002. NSS clearly states that the US will take preemptive actions to prevent hostile actions such as the use of WMD by international terrorist groups or rogue states.[13] Such actions described in the NSS have been considered to be "preventive attack" (see below). The Bush Administration seems to have redefined such actions as an exercise of self-defense: a rogue state or terrorist group may use WMD and/or missiles without warning, so the very situation of their possession of WMD is considered a threat justifying the exercise of self-defense. The Bush administration's position has drawn criticism from other countries not only on points of international law but also as an expression of the US unilateralism.

One must note that the interpretation of "preemptive attacks" by the Japanese Government described above (actions in response to clear intent and preparation for hostile action) differs from the interpretation of "preemptive actions" given by the Bush Administration.

c. Preventive Attacks

Preventive attack can be defined as an attack before a threat becomes apparent; that is, on a country that does not pose an imminent threat, but could develop into an unacceptable threat if left alone. The UN Charter only allows preventive attacks against former enemies of allied nations during the World War II (Japan, Germany, Itary, Romania, Bulgaria, Hungary, and Finland) under the article on former enemies—obviously this article is out of date and must be removed as soon as possible. As it is extremely difficult to distinguish preventive attacks from aggression, such actions are not generally allowed under international law.

A typical case of preventive attack was Israel's strike on Iraq's Osirak nuclear power plant in 1981. Israel argued that the action was taken to prevent Iraq from producing nuclear weapons that could target Israel, but the UN Security Council adopted the resolution describing the Israeli action as a violation of the UN Charter. Under international law, Israel's attack on Osirak was not considered the exercise of self-defense.

It is almost impossible to conduct preemptive operations on a WMD-armed rogue state when its attacks are imminent because of risks involved in the use of such weapons.[14] However, it is extremely difficult under the law to exercise the right of self-defense only because a country possesses weapons when their intent to use such weapons is not apparent; even if the start of

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[13] United States of America, *The National Security Strategy of the United States of America*, September 2002, p. 15.
[14] Tomonori Yoshizaki "U.S. Policy on Preemption: Its Impact on International Order and Strategy," *Kokusai Anzenhosho*, Vol.31, No. 4 (March 2004), p. 8 (in Japanese) .

preparation for an armed attack can be seen retroactively, it is not possible to go back as far as the time of acquiring the weapons.[15] The issue is how wide one can define "self-defense" under international law. Depending on the purposes and result, such preventive attacks may influence legal interpretations. In an extremely tense situation preventative attacks may actually influence the views of the international community. As the potential risks for WMD proliferation increase, the conventional wisdom distinguishing preventive from preemptive attacks is becoming more obscure, necessitating their redefinition in conformity with the present international environment.[16]

2) Issues concerning Domestic Defense Laws

Japan views offensive defense measures against an enemy's missile launch sites as not infringing on the Constitution, as long as the following three conditions are met; ① there is an imminent threat; ② there is no other appropriate measure to counter it; ③ action must be limited to the minimum required. The Japanese Government has stated that the possession of restricted power to attack enemy missile launch sites does not violate the Constitution, unlike the case of offensive weapons. Therefore, it is not only permissible to attack missile launch sites as counter-attacks to prevent subsequent missile strikes, but also it is not a violation of the Constitution to implement such attacks as an exercise of self-defense – for example, when Japan has been attacked by weapons other than ballistic missiles and it seems inevitable that ballistic missile attacks will follow.

Furthermore, as described above, armed attacks occur from the beginning of preparations for attack. Whether an enemy has started to prepare for attacks will be determined after thorough review of the situation, the enemy's attack capabilities, and its expressed intent. If an enemy has clearly expressed hostile intent and has ballistic missiles ready for launch, such action can be seen as preparation for attacks. Under this situation, preemptive attacks on enemy missile launch sites to limit damage from first strikes cannot be considered as a violation of the Constitution.

The problem will be when an enemy contemplates surprise attacks with ballistic missiles. If the first strike is likely to involve WMD, this would strengthen motives to attack missile launch sites, even if this is more in the scope of preventive attacks rather than preemptive attacks. On the other hand, current interpretation of the Constitution makes it impossible to attack missile launch sites unless preparation for ballistic missile launches can be determined as intended for Japan. Certainly it is important to collect all data on political and military conditions to help prevent surprise attacks.[17] However, given that ballistic missiles with very short flight times can easily

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[15] Akira Mayama, "On the Notion of Armed Attack under the United Nations Charter," *Kokusai Anzenhosho*, Vol. 31, No. 4 (March 2004), p. 23 (in Japanese) .
[16] Yoshizaki, "U.S. Policy on Preemption," p. 10.
[17] Comment of the Japan Defense Agency upon the response against surprise attacks (September 21, 1978).

be used for surprise attacks, it is difficult that information collecting efforts will succeed on their own.

Considering changes in the security environment that could lead to imminent ballistic missile attacks, it may be necessary to review constitutional interpretations on the timing and required conditions on exercise of Japan's self-defense right. Also it should be noted that justifying deterrence measures by suggesting the possibility of preemptive attacks will always risk becoming a "self-fulfilling prophecy."[18] Any redefinition of required conditions for preemptive attacks must also retain a strict limit on the exercise of such attacks.

It is significant that discussion of attacks on missile launch sites increased in Japan following missile launches by North Korea in July 2006. In the future, it will be necessary to distinguish "preemptive attacks" or "counter attacks" permissible as the right of individual self-defense under international law from "preventive attacks" not permitted by international law. Japan should proceed as quickly as possible to not only secure necessary defense capabilities, but also review conditions for their use, including the international security environment, the posture of potential adversaries, and the characteristics of both ballistic missiles and offensive defense measures.

3) Issue of Defense Policies

As described above, Japan does not possess offensive capabilities – whether "preemptive attacks" or "counter-attacks" – under the exclusively defense-oriented policy as well as in consideration of political effects on surrounding countries, even though such capabilities are permissible under the current international and domestic laws.

In politics, the phrase of "exclusively defense-oriented policy" expresses Japan's determination to never invade other countries after the World War II. In view of military rationale, this means that Japan would have a "strategic defensive" posture that could have included possession of offensive defense measures for self-defense. However, Government statements that offensive weapons do not conform to the spirit of the Constitution,[19] and that exclusively defense-oriented policy means defense without attacking an enemy's bases[20] have prevented Japan from possessing weapons with offensive capabilities to attack opponent's ballistic missile bases. It has been generally construed that Japan's term of "exclusively defense-oriented policy" means to limit military measures to Japanese territory and surrounding areas.

However, applying such restrictions risks both great damage and huge casualties to Japan, which

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[18] Yoshizaki, "U.S. Policy on Preemption," p. 6.
[19] Answer of Shigejiro Inou, Director-General of the Defense Agency, at the Cabinet Committee of the House of Representatives, March 19, 1959.
[20] Answer of Prime Minister Kakuei Tanaka at the House of Representatives, October 31, 1972.

defense policy is supposed to prevent. In terms of military rationale, it is also preferable to destroy enemy capability prior to attack. If an enemy has clear intent to attack Japan and such attacks are imminent, action against the origin of hostile threats would be the most cost-effective measure. Such self-defense actions are clearly within the scope of "offensive defense." In a changing security environment, Japan needs to leave from the concept of "exclusively defense-oriented policy" and adopt a "strategically defensive" posture including offensive defense measures as a new basic concept. In doing so, the Japanese Government will have to provide thorough explanations of its intention to the international community as well as the Japanese people.

On the other hand, Japanese capability to attack ballistic missile launch sites could complicate Japan-US joint operations. If Japan and the US are to jointly conduct attacks on missile launch sites, it will be necessary to share information in real time and distribute targets appropriately. This will certainly develop Japan-US defense cooperation further, but if there is a huge gap between Japan and the US in terms of capabilities to attack missile launch sites, the participation of Japan in offensive defense operations could obstruct the US actions and prevent the effective removal of ballistic missile threats.

While Japan should acquire capabilities to attack missile launch sites, doing so will take considerable time and resources. Thus for the time being it is realistic for Japan to rely on the US and support the US offensive defense actions. Such support may include provision of information, in-flight refueling, and participation in air superiority operations. In addition, if Japan acquires a capability to attack ballistic missile launch sites, Japan and the US may share roles for such attacks. For example, the US forces could concentrate on inland targets including enemy headquarters, communication centers, or underground silos, while Japanese forces conduct attacks on targets closer to Japan, such as missile launch sites near the coast.

To destroy enemy missile attack capability by the first strike, Japan needs to not only possess quantitatively and qualitatively sufficient attack forces but use them collectively. However, such capability will undoubtedly require great cost and time. There is also risk of retaliatory attacks from launchers not destroyed in first strikes, or that an adversary would have an incentive to conduct preemptive attacks before Japan could carry out first strikes.[21]

If there is no realistic prospect of Japan acquiring such capabilities, it is more effective to take defensive measures in close cooperation with the US by gradually improving existing forces, while considering offensive defense measures as part of multi-layered defense capabilities along with active defense (BMD) and passive defense (damage confinement measures).

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[21] Takahashi, "Coping with a Ballistic Missile Threat," p. 116.

Japan also needs to consider that acquisition of capability to attack missile launch sites may cause concern among surrounding countries. Japan' capability to attack missile launch sites should be focused on weapons to neutralize specific military facilities, not those that would cause massive retaliatory destruction. However, other countries may still consider Japan's acquisition of any attack capability as a shift toward more offensive military posture. When North Korea's recent missile launches prompted discussion in Japan on offensive defense measures, both China and South Korea expressed concern immediately. However, no statements in Japan mentioned "preemptive attacks," let alone "preemptive actions," but only the possibility of counter-attacks. In this sense, criticism from South Korea, which already has substantial counter-attack capability against North Korea, is not convincing but rather seems politically motivated.

Nevertheless, action by Japan to acquire offensive defense capabilities will unavoidably draw fire from surrounding countries. To counter such concerns Japan needs to clarify the concept of a "strategically defensive" posture, and help develop a framework for CBMs in the region.

4) Issues in the Development of Offensive Defense Measures

a. Existing Capability and Deficiencies

Reflecting its "exclusively defense-oriented" policy, Japan has strictly restricted to equip itself with ground-attack weapons system. Air Self-Defense Force (ASDF) weapons are mostly for air defense missions, and are very limited in ground attack capability. Maritime Self-Defense Force (MSDF) systems also lack ground attack capability although there is anti-ship capability. Ground Self-Defense Force (GSDF) weapons are intended for combat within Japanese territory. In other words, the Self-Defense Forces have had very limited capability for either ground attack or Suppression of Enemy Air Defence (SEAD) operations, since the Guidelines for Japan-US defense cooperation based on the Japan-US Security arrangement designate such activities to the US Forces.

Listed below are ASDF capabilities related to attacks against enemy bases. When Japan acquires capability to attack ballistic missile launch sites, it must consider which SDF should have (or share) such systems, depending on the characteristics of each Service.

① Command and control capability
- Current equipment: AWACS
- Shortfalls: target selection and planning

② Sharing of tactical capability information in real time
- Current equipment: none
- Shortfalls: Joint Surveillance Target Attack Radar system (JSTARS), and TADIL-J (Link16)

③ Reconnaissance capability

- Current equipment: RF-4 (limited in performance, collection and analysis capability)
- Shortfalls: Stand-off reconnaissance capability, and UAV

④ Electronic warfare capability
- Current equipment:YS-11EA (only with communications jamming function)
- Shortfalls: Electronic jamming, integrated electronic warfare system

⑤ SEAD capability
- Current equipment: none
- Shortfalls: Escort jammer, and Anti-Radar Missile (ARM)

⑥ Ground attack capability
- Current equipment: planning to acquire Joint Direct Attack Munitions (JDAM) guided by GPS
- Shortfalls: Laser designator and targeting Pods for precision guided attacks, Laser Guided Bomb (LGB), GPS guided air-to-ground missiles (JSOW), anti-hard target attack weapons (deep penetration bomb), and night time attack (night vision equipment)

⑦ Combat Search and Rescue
- Current equipment: U-125, CH-47
- Shortfalls: Self-defense capabilities for search and rescue aircraft

⑧ Air-to-air refueling capability
- Current equipment: planning to acquire KC-767J (delivery from 2006, operational from 2008)

b. Weapons for Offensive Defense

For offensive defense measures to attack ballistic missile launch sites, possible weapons may include:

① Ground to ground attack
- Ballistic missiles
- Cruise missiles

② Sea-based strike
- Cruise missiles from surface ships
- Cruise missiles from submarines

③ Air to ground attack
- Air-launched cruise missiles
- Air to ground attack (land and sea-based strike packages)

Japan will need to consider likely threats as well as political concerns in evaluating when introducing any of the above weapon systems. For the moment, it is preferable to aim for the development of strike packages and acquisition of various cruise missiles. In the future, Japan may need offensive and defensive capabilities using new technologies such as High-Powered Microwave Devices (HPMD), which disable electronic weapons and instruments instantly through

Electric Magnetic Pulse (EMP) effects that can destroy laser or ballistic missile capabilities.

Especially in consideration of Japan's political position and geographical characteristics, the combination of cruise missiles with stand-off precision attack capability, such as Tactical Tomahawk cruise missiles, and high performance penetration warheads from strike aircraft will make it possible to destroy specific military targets while limiting collateral damage.

For cruise missiles, one option is to purchase conventional Tomahawk missiles from the US, but these missiles require several hours to prepare for launch, so using them in response to imminent ballistic missile launchings may not be effective. Moreover, use of Tomahawk missiles will require selection of aircraft, submarine, or surface ship platforms. While cruise missiles have a disadvantage of not being able to return once launched, it is possible to impose strict limits on their usage. This enables the restriction of targets based on political reasons, and would avoid mistaken attacks. Furthermore, cruise missiles can be launched from a remote area, thereby avoiding risks of friendly casualties.

On the other hand, since attacks on mountainous terrain and other areas are difficult for cruise missile, strike packages consisting of UAVs for reconnaissance, targeting and attack operations, as well as fighter and stealth attack aircraft would be very effective. New capabilities such as anti-radar missiles (ARM) and stand-off-jamming (electronic warfare aircraft) will be needed for SEAD. Precision guided munitions launched by aircraft can be called back even after command to implement attacks, as long as they have not yet dropped their bombs. These aircraft also allow more flexible target settings, so they are especially effective for attack of mobile missile launchers. The capability to attack ballistic missile launch sites can be added as upgrades to existing fighter and ground attack aircraft. Such measures may lessen reactions from other countries, compared with newly acquired cruise missiles. On the other hand, attacks on missile launch sites will require that strike packages move relatively closer to targets, which are raising operational risk.

Information needed to determine whether ballistic missiles attacks against Japan are underway, or identify missile launch sites, must be obtained instantly. In case of Japan, major threats will be MRBMs on mobile launchers, but it is extremely difficult to detect them and communicate information to command and control system as well as to offensive weapons in real time. In the case of Scud hunting during the Gulf War, the number of launchers destroyed was quite small; many bombs hit decoys or tanker trucks. This certainly symbolizes the difficulty of attacking mobile launchers.[22] During the Iraq War of 2003, the US Forces inflicted considerable damage on Iraqi ballistic missiles forces, but this was under a situation of almost absolute air supremacy, and

[22] Ibid, p. 112.

Special Forces were active in Iraqi territory.[23] To attack ballistic missile launch sites, Japan needs to develop highly advanced information collection systems, simultaneous data link capability, and air surveillance as well as air superiority capabilities in addition to offensive weapons, which again will require considerable time and cost.

In this sense, the introduction of UAVs linked to satellites for precision surveillance, targeting, guidance, and attacks as well as the introduction of HPMD will provide broader options in offensive defense measures, especially against ballistic missiles on mobile launchers.

[23] Ibid, pp. 113-115.

Chapter 11 Passive Defense Measures

1. Passive Defense and Trends in Japan

1) Purposes and Significance of Passive Defense

Passive Defense is "[m]easures taken to reduce the probability of and to minimize the effects of damage caused by hostile action without the intention of taking the initiative."[1] Based on such definition, possible measures of passive defense include activities to protect people and respond to damage, reinforcement of facilities and buildings, securing of alternate infrastructure, response capabilities against CBRNE (Chemical, Biological, Radioactive, Nuclear and Explosive) weapons, and maintenance of military capabilities.[2]

The purposes of passive defense are, in the aspect of protecting people, the minimization and confinement of damages to lives and assets, and the maintenance of infrastructure needed for survival and administrative functions. In view of military operations, the objectives are to maintain continued operations and services even under severe conditions of degraded capabilities or a CBR (chemical, biological, or radioactive) weapons environment. In this chapter, passive defense as a response to ballistic missiles will be discussed mostly in view of protecting people (civilians).

Technologies to intercept ballistic missiles have advanced significantly, yet the technologies of ballistic missiles themselves advance day by day as well. Attacking missile launch sites (offensive defense) or intercepting incoming missiles (active defense) may be effective measures, but considering the technological gaps and budget restrictions, there is no guarantee that such measures can completely defend Japan. That is why the passive defense is important. By combining and balancing the capabilities of offensive defense, active defense, and passive defense, a truly effective response against ballistic missile attacks with the most efficient distribution of resources will become possible.

Passive defense not only reduces damage to lives and assets, but also can relieve anxieties, thereby providing both physical and psychological effects. In addition, passive defense is most closely linked to the activities of people, so that their participation will raise their willingness to confront the threat of ballistic missiles. Passive defense is also an essential element from a military perspective; that is, protection of defense power in the case of successive ballistic missile attacks that lead to actual invasion.

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[1] *Department of Defense Dictionary of Military and Associated Terms*, Joint Publication 1-02, 12 April 2001 (As Amended Through 14 April 2006), p. 403.

[2] In the US, the term "Consequence Management" is "[a]ctions taken to maintain or restore essential services and manage and mitigate problems resulting from disasters and catastrophes, including natural, manmade, or terrorist incidents." Although the threats described are different, it can be construed as a synonym for passive defense. For the definition of consequence management, *ibid.*, p. 113.

During the Gulf War of 1991, Israel demonstrated how passive defense effectively functioned against ballistic missile attacks. Iraq launched 39 Scud missiles against Israel to complicate the situation. The US asked Israel to refrain from counter-attacks, and, at the same time, deployed Patriot PAC-2 batteries there. After the start of the Gulf War, the US tried to destroy Iraqi ballistic missile launchers, and Israel distributed gas masks to Israeli citizens with training on their use to prepare for possible use of chemical warheads. They also helped prepare provision storage and sealed rooms for family shelters.

Since Iraqi ballistic missiles had poor accuracy, Israel issued warnings upon the launch of missiles to place all Israel on alert. Following missile strikes, civil defense units fought fires, conducted rescues and provided other relief. All ballistic missiles Iraq used had conventional warheads, and with effective passive defense Israel was able to minimize casualties to two dead and 226 wounded despite the fact that missiles damaged over 6000 homes and 1300 other buildings. Confinement of damage was a major element in restraining Israeli counter-attacks.[3]

2) Development of a System to Protect People in Japan

Nuclear and ballistic missile issues of North Korea, 9/11 terrorist attacks on the US, and the changing security environment in Northeast Asia have increased Japanese interest in emergency defense legislation. As a result, Japan established the Armed Attack Situation Response Law, the basic legislation for responses to situations (emergency legislation), in June 2003. This was followed in June 2004 by a "Law Concerning the Measures for Protection of the Civilian Population in Armed Attack Situation" (hereinafter referred as Civil Protection Law). This Law stipulates the responsibilities of national and local governments and other public sectors to minimize the effects of such attacks, and damage control as well as evacuation and relief measures.

Based on the Civil Protection Law, the Japanese government developed a Basic Guidelines for Protection of the People (Basic Guidelines) in March 2005. This Guidelines list measures on the protection of people, including evacuation, relief, and response to armed attacks disaster. The Basic Guidelines classifies four types of armed attack situations, including ballistic missile attacks. The Cabinet Office also prepared a safety manual, "Protecting Ourselves against Armed Attacks and Terrorism."

On ballistic missile attacks, the Basic Guidelines note the extreme difficulty of identifying targets upon missile launches as well as the very brief flight times of these missiles, thus emphasizing the

[3] See Kunihiko Kida, "Gulf War and Missile Defense: What Israeli did at that time," *Securitarian*, November 1998 [http://www.bk.dfma.or.jp/~sec/1998/11/kida.htm] (in Japanese) .

importance of confining damage through quick communication, and evacuating mainly indoor areas, and taking into consideration of NBC attacks.

Local governments and public sectors are developing their own civil protection plans based on the Basic Guidelines. In February 2005, the Fire and Disaster Management Agency published a model civil protection plan for local governments. Based on this model, 47 prefectures completed their civil protection plans by the end of FY2005. During FY2006, cities and towns have been developing their civil protection plans and evacuation instructions.

Joint exercises between national and local governments have been conducted with Saitama, Toyama, Tottori, and Saga prefectures. These exercises featured desk plan training on the assumption of simultaneous terrorist attacks. In November 2005, Fukui Prefecture and the towns of Mihama and Tsuruga City conducted exercise with an assumed terrorist attack on the Mihama Nuclear Power Plant. Desk plan exercises and actual trainings were conducted among many other local governments in 2006.

As seen here, the Japanese system to protect people is being gradually but steadily developed. However, in responding to ballistic missile attacks, Japan seems to focus more on active defense (BMD) or offensive defense; interest in passive defense still remains on a lower level. Even at the time of North Korea's missile launches in July 2006, the Fire and Disaster Management Agency sent information obtained from the Cabinet Office to prefectures concerned around 6:30 am, about three hours after the first missiles were launched. Although there was not much possibility that the missiles would hit Japan, this highlighted a problem in the communication of information. There are many books published on BMD but only few describe passive defense, keeping the awareness of the general public at a low level.

2. Measures of Passive Defense against Ballistic Missiles Attacks

Measures of passive defense vary, but can be classified mainly as follows:

- Reducing Vulnerability
- Providing Warning
- Facilitating Recovery and Reconstitution

The following sections describe Japan's situation and measures of passive defense, particularly against ballistic missile attacks.

1) Reducing Vulnerability

Reducing vulnerability serves to ensure that lives, assets and facilities survive ballistic missile attacks, minimize casualties and damage, and maintain critical infrastructure. Such measures need to be implemented systematically before threats materialize.

Reducing vulnerability measures also help to avoid ballistic missile attacks through concealing target locations. Targeting plays an important role in preparations for ballistic missile attacks. Major targets are usually those at a national "center of gravity" such as key defense facilities, communication centers, core political, administrative and economic functions, nuclear power plants, and other critical infrastructure. Effective implementation of measures to reduce the vulnerability of such key facilities could lower the likelihood of their being targeted for attack and certainly reduce damage if attacked.

a. Reinforcement of Key Facilities

This is literally the strengthening of facilities to reduce damage when hit by ballistic missiles or by their components and debris. Construction standards in Japan mainly address resistance to earthquakes, but have not considered external impacts such as those from ballistic missiles. Certainly it is not practical, in terms of cost-effectiveness, to reinforce ordinary homes and administrative buildings against ballistic missile attacks. Reinforcement work would focus on lifeline-related facilities such as electricity, gas, water and communications; national and local government organizations for information collection and decision-making (including major local SDF headquarters); and nuclear power plants.

b. Deconcentration of Key Functions

Concentration of administrative, financial, and commercial functions is convenient and efficient for routine activities, but increases the risk of serious damage when targeted for attack. Therefore, central and local governments need to avoid to the extent possible concentration of administrative functions and lifeline infrastructure to minimize damage from ballistic missile attack.

c. Measures against WMD Attacks

Response to attacks by WMD-armed ballistic missiles requires expert knowledge and specified equipment to be delivered within a very short time. In Japan, the sarin attacks on Tokyo subways and 9/11 terrorist attacks in the US led to gradual preparations against biological and chemical weapons use by terrorists and other groups, but these efforts are not yet sufficient. It is necessary to quickly mobilize initial response by establishment of evacuation sites and periodic exercises to prepare for WMD attacks, while building stocks of vaccines, neutralizers, and decontamination agents.

d. Securing Redundancy and Robustness

As demonstrated in the case of huge earthquakes, recovery of lifeline facilities takes a long time; the longer it takes, the less motivation people have reconstruct their lives. Many key facilities in Japan are increasingly interdependent, so any failure in one will likely cause a cascading effect of

dysfunction and broadened damage that will impact political, economic, and security systems, as well as health and welfare measures, and thus undermine trust in government.[4] Strengthening the redundancy and robustness of key infrastructure will not only ensure survival in the face of ballistic missile attacks, but also encourage public willingness to respond, which will enable quick and appropriate actions by the Japanese Government.

When there is no awareness of imminent threats, it will not be easy to gain understanding of the need to secure key infrastructure through sacrificing efficiency and economy. At present, there is no national policy to maintain the functions of cities and regions in the face of armed attacks. On the other hand, such measures against attacks, including ballistic missile strikes or terrorist attacks, would also contribute to quick recovery from natural disasters such as earthquakes.

2) Providing Warning

a. Information Collection, Detection of Launches, and Issuance of Warning

One of the necessities of passive defense is quick warning upon detecting signs of ballistic missile launch, and rapid communication of such information to relevant ministries and agencies as well as the general public. During the Gulf War in 1991 Israeli warning systems did not function effectively during the first phase of Iraqi missiles attacks; warnings were issued after the missiles had hit. US support allowed about 5 minutes warning, so people could reach shelters and had time to help the elderly and children with gas masks.[5] Early warning is the most effective measure to confine damage, but mistaken warnings could result in unnecessary actions, and even cause panic.

Note the flow of warning notices; warning of imminent ballistic missile launch is broadcasted to the general public through TV and radio. Warnings of actual launches would be issued for each launch with sirens and similar measures where missiles are expected to hit.[6] Information for ballistic missile launch warnings would be provided by collection and analysis of information from early warning sensors. FPS-XX, X-band radar, or SPY-1 radar are mutually complimentary in their features, and enable the early identification of incoming ballistic missiles and expected impact areas, thereby contributing greatly to the early issuance of warnings. On the other hand, to detect signs of ballistic missiles launching and launches immediately afterward, it is also necessary to gather human intelligence information (HUMINT) in advance, as well as electronic and communication intelligence (ELINT/COMMINT) from reconnaissance satellites. In this respect, Japan's past measures were unfortunately insufficient. As noted earlier, Japan needs to consider developing its own satellite capability, in addition to information exchanges with the US.

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[4] United States of America, *The National Strategy for the Physical Protection of Critical Infrastructures and Key Assets*, February 2003, p. 81.
[5] See Kida, "Gulf War and Missile Defense."
[6] Cabinet Secretariat, "Protecting Ourselves against Armed Attacks and Terrorism,"" September 2005, p. 6. (in Japanese)

b. From Issuance of Warnings to Instructions for Evacuation

According to the Basic Guidelines to protect citizens, information on ballistic missile launches is to be reported to the Prime Minister's Office as soon as possible, distributed to relevant ministries, agencies, and organizations through the Cabinet Office, and conveyed to municipal governments through prefectural offices, then to the public. Japan is also preparing to establish a Civil Protection Warning Siren (J-Alert) to send alert requiring immediate response, such as warnings of tsunamis, severe weather, and armed attacks. The Fire Defense Agency would issue J-Alerts to the disaster prevention wireless systems of municipal governments through a satellite communication network, so to alert to all residents simultaneously. The J-Alert system to be installed from 2007 has a proven capability to send information from the Fire Defense Agency through wireless systems within 6.25 seconds.[7]

On the other hand, there are some issues that need to be addressed; for example, how to ensure the immediacy and credibility of an alert system, or the most appropriate alert procedures (setting criteria for warning issuance, the flow of warning information, or how to keep residents informed). It is essential to inform the people what warning sirens mean.[8] Other issues to be clarified are who shall responsible for issuing warnings or evacuation instructions, and how such decisions are to be made and implemented. Moreover, Japan needs to determine clear standards for measuring immediacy and accuracy that take into account reactions to the issuing of warnings.

During the North Korean missile launches in July 2006, it took up to several hours for central government warnings to reach local governments and other locations. It is fortunate that the missiles did not impact Japanese territory, and the delayed communication did not result in disaster. But, based on the lessons learned from this incident, it is necessary to develop an instant alert system as soon as possible. Of course, responsibilities for issuing the alert should be clearly defined, including protection of intelligence information and judgment on the timing of alert issuance.

c. From Instructions for Evacuation to Evacuation Guidance

Measures to be taken from alert issuance until missile impacts include evacuation of people from threatened areas by police, firefighters and the SDF. However, there are not many people who understand evacuation procedures in case of ballistic missile attacks. Even the SDF, police, firefighters and local government staff are not well aware of or trained in protection and relief activities, as well as procedures to request support.

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[7] *Mainichi Shimbun*, July 12, 2006.

[8] Sample sound of a siren can be heard at the Cabinet Secretariat Website [http://www.kokuminhogo. go.jp/pc-index.html].

Response to ballistic missiles is different from measures dealing with other types of armed attacks because of extremely short warning time as well as the possibility of exposure to WMD. Response measures, including development of appropriate procedures and training with people, must also conform to local characteristics of the targeted areas.

3) Facilitating Recovery and Reconstitution

If interception by active defense (BMD) fails to prevent missile strikes, prefectural governments would implement measures to evacuate residents, rescue and treat victims, confine damage (fire, building collapse, spread of diseases, etc.), and restore facilities and equipment. Such measures would be based on the Basic Guidelines and the civil protection plans developed by government organizations and local communities. If damage and casualties do not exceed the range of ordinary disasters, response measures will likely follow those similar for large earthquakes, so local governments could use plans for natural disasters developed from past experience. However, for attacks involving WMD, support by the SDF and Fire Agency personnel with expert knowledge and skills would become critical. For areas contaminated by WMD, decontamination would be needed in addition to existing plans.

3. Policies Japan Needs to Take

1) Comprehensive Strategy and the Promotion of Measures

The objective of passive defense cannot be achieved by the efforts of the Ministry of Defense, the SDF, police, and firefighters alone. National and local governments as well as other public sectors must unify their efforts to implement planned and coordinated measures at every stage of the emergency.

In the US, the Missile Defense Agency (MDA) and the Department of Homeland Security (DHS) promote measures for missile defense and consequence management as their major tasks. Japan, on the other hand, has developed policies like the Basic Guidelines on how to protect people, but government agencies tend to address the issue as a mere additional duty. Even at the level of national government, the importance of passive defense can hardly be described as fully understood. A new organization established under the Cabinet Office or the Ministry of Defense should develop and implement a comprehensive strategy.

a. Completion of Civil Protection Plans

The Basic Guidelines on the protection of people prepared by the national government and civil protection plans prepared by local governments are limited to basic plans, and lack details of measures for ballistic missile attacks. These plans are to be tested through training and exercises, and modeling and simulations (M&S), and revised accordingly. Procedures from issuing of alerts to evacuation guidance must verify the effectiveness of information flow between various ministries and agencies. According to the Basic Guidelines, a headquarters for

emergency response at the national government level is established, which is to coordinate efforts between national agencies and local governments. The government should provide comprehensive training on response to emergencies to check for any lack of smoothness in coordination within the headquarters, as well as between ministries and agencies.

b. Cooperation with US Forces

Cooperation with US Forces include not only active defense and information sharing, but also required cooperation in rescue, medical services, restoring facilities and equipment, and protection against WMD. Japan needs to develop joint program for strengthening of cooperation with the US and improve mutually complimentary capabilities. US Forces stationed in Japan and the SDF are said to be studying such activities but further review, including legislative issues, will be needed on activities of US Forces in Japan, or, in turn, Japan's support for any damages inflicted on US bases. It will also be important to coordinate with the US State Department, which is primarily responsible for matters concerning US personnel or other citizens outside the US.

c. Development of Long Term City Planning, and Review of Capital City Functions

Japan should gradually develop the redundancy and robustness of its lifeline infrastructure, as well as facilities and preparedness to enable timely decision-making and response activities throughout the duration of emergencies.

2) Development of Public Awareness

The passive defense explained above includes reduction of damage through issuance of alerts, evacuation guidance, rescue activities, recovery from damages, and broader measures for reducing vulnerability. Implementation of passive defense will inevitably affect the lives of people, so it cannot be done without public understanding. Unfortunately, compared to active defense measures such as BMD, the Japanese public has a lower level of awareness on the need for passive defense. The Civil Protection Law does not make cooperation on safety measures mandatory, but is left to the voluntary will of the public.

Again, response against ballistic missile attacks requires the appropriate combination of offensive defense, active defense, and passive defense. Passive defense, in particular, is closely related to the daily activities of people, so it is essential that they understand its importance and can then cooperate its activities. For this purpose, the Japanese Government needs to explain the importance of passive defense through such activities as providing analyses of damage from missile strikes and debris using M&S studies. Other important activities will be periodic training and exercises based on civil protection plans, and establishment of a civil defense teams located in each region.

3) Defense Capability against Weapons of Mass Destruction

Since ballistic missiles can be armed with WMD warheads, it is imperative to reinforce defense capabilities against WMD. Yet, the kind and level of capabilities needed are not easy issues to resolve. At present, Japan has only limited capabilities to defend against the WMD. In addressing this problem, the following capabilities should be maintained as a minimum level of response:

① Defense and sheltering— preventing and reducing contamination/exposure to WMD;

② Detection and notification— detecting and measuring contamination from WMD, and making timely notifications;

③ Maintaining key functions—a decontaminating, quickly implementing recoveries through medical services, and restoring functions; and

④ Conducting activities under CBR environment—continuing services and activities, especially, police, and firefighting operations, in a WMD-contaminated environment.

4) Development of Deficient Functions

Deficiencies in passive defense measures such as those listed below need to be corrected:

① Capabilities of organizations, such as the SDF, police and firefighters, which must operate in impacted areas before and after ballistic missiles attacks, to protect themselves against WMD;

② Building stocks of equipment and supplies required for medical services and decontamination activities in case of WMD attacks;

③ Operation of early warning satellites to reinforce information collection and initial response capabilities; and

④ Protection of the SDF units and bases with capabilities for active defense, especially the C2BMC functions.

Chapter 12 Defense Industrial/Technology Base

1. Japan's Defense Industry and its Technology Base

Many reports have discussed the situation of Japanese defense companies in regard to their technology base.[1] Financial difficulties have constrained Japan's defense budget, forcing reductions in procurement and R&D funding. Procurement budgets have contracted to about 830 billion Yen in 2006 from about 1 trillion Yen in 1995. Since Ministry of Defense orders many types of defense equipment, contractors need to maintain production lines that can accommodate various items. However, due to the Japan's "Three Principles on Arms Export"— not to license the export of arms ① to communist countries, ② to UN Security Council arms embargo countries, and ③ to countries involved in or likely to be involved in international conflicts—and its strict application—① not to license the export of arms to the countries or regions restricted in the Three Principles, ② to refrain from the arms export to other areas not included in the Three Principles in conformity with the spirit of the Japanese Constitution and Foreign Exchange and Foreign Trade Law, and ③ also to treat the equipment for arms production in the same category as arms —Japanese companies cannot expect to export such products but must rely solely on MOD(former JDA) orders. This obviously reduces production rate and cost-effectiveness, thus increasing the expense of domestically produced defense equipment.

Budget cuts mean further decreases in procurements. With reduced operating rates and increased production costs, defense companies have difficulty keeping production lines open and engineers employed. "In defense departments of Japan's companies, over 70% of manufacturing facilities and over 80% of engineers and technicians are tasked solely for defense equipment production. As the production of defense equipment requires special technologies and production processes, there are many regulations and restrictions applicable to such production."[2] The maintenance of a defense industrial/technology base has been a big burden for defense related companies in Japan. With reduced orders, the defense departments become less important in these companies and some companies are withdrawing from defense production. As mentioned above, defense production requires special technologies and facilities, so once a production foundation is lost, it takes many years and tremendous expense to recover. In Japan, almost all

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[1] See, for example, Research Committee on Defense Industrial/Technology Base, "Basic Direction on the Maintenance and Development of the Defense Industry and Its Technology Base: Toward the Development of a Foundation for 21st Century," November 2000 (in Japanese); Japan-US Industry Forum for Security Cooperation, "Joint Statement of the Japan-US Industry Forum for Security Cooperation: Interests of Defense Industries in Japan and the US," December 2002; Nippon Keidanren, "Future Development of Defense Power: Toward Strengthening Defense Equipment Production and Technology Base," July 20, 2004 [http://www.keidanren.or.jp/japanese/policy/2004/063.html] (in Japanese); Japan Defense Agency, "Report of the Meeting on Security and Defense: Vision for Future Security and Defense," October 2004 (in Japanese); Meetings on Strategy to Procure Defense Equipment, "Toward the Procurement of Equipment for a New Age: Establishing the Technology Base Truly Needed Defense Production," June 2005 (in Japanese).

[2] Meetings on Strategy to Procure Defense Equipment, "Toward the Procurement of Equipment for a New Age," p.20.

defense technologies reside within these contractors. If the weakening of defense companies and their technology base continues it will become difficult to respond to emergencies.

In addition, Japan has another problem in that the public and private sectors do not share an awareness of the need to jointly develop and produce equipment on an equal basis. There is a strong hierarchy in which the public sector has superiority and never takes risks in development, while the private sector submissively accedes to such hierarchy.[3] To be specific, development work always carries risk, which may be a factor in changing manufacturing costs. In case of defense industries in Japan, the private sector bears increased costs, while any cost savings must be returned to the public sector. The application of such "excess profit returns to purchaser" rule results in the public sector bearing no risks.

Excessive interference from the public sector discourages competition and consolidation among defense industry companies, thereby leading to higher priced equipment, less progress in technological innovation, and ultimately lowered competitive power. In reality, the role of the public sector is to develop defense capability and ensure its effective operation, while the goal of the private sector is to attain profits. Therefore, serious dialogue between public and private sectors must be maintained to enable the pursuit of both sectors' purposes.

In Europe and the US, there are many cases where equipment is studied, developed and produced with other countries bilaterally or even multilaterally. Such joint efforts narrow gaps in defense technologies, improve efficiency in budgeting by concentrating on priority areas and avoiding overlapping investments, maintain defense industrial/technology bases of allied and friendly countries as well as domestic one, and strengthen interoperability among allies.[4] However, in case of Japan restrictions imposed by the Three Principles of arms export have curtailed participation in international programs.

The basic concept of the Three Principles on Arms Export is not to exacerbate international conflicts. However, excessively restrictive application of the Principles has been not only a barrier to Japan-US cooperation on defense equipment, but prevents Japan from providing equipment, materials, and technologies that can benefit the international peace and stability. As noted above, sole procurement by the Government of Japan makes the production costs of defense equipment much higher than those of other countries. In the case of joint development projects like the FSX support fighter, no components could be exported to the US but used only in Japan,

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[3] Akio Shono, "Issues on Acquiring Equipments," *DRC Annual Report 2004*, 2004 [http://www.drc-jpn.org/AR-8/shohno-04j.htm] (in Japanese).

[4] See Masahiro Shigemura, "Proposal for Health of Japanese Defense Industries," *DRC Annual Report 2003*, 2003 [http://www.drc-jpn.org/AR-7J/shigemura-03j.htm] (in Japanese); Masahiro Shigemura, "Security Policies in International Equipment Cooperation," *JFSS Quarterly Report*, Japan Strategy Study Forum, Suring 2005 [http://www.jfss.gr.jp/jp/zuisou_35j.html] (in Japanese).

thereby leading to higher prices.[5] As discussed below, the application of the Three Principles on Arms Export has been modified for joint BMD projects, but many issues remain for the defense industry and its technology base as a whole.

As for defense industrial cooperation between Japan and the US, there are also many restrictions. The Japan-US Industry Forum for Security Cooperation pointed out the following problems:

> "Industry dialogue can only be as effective as governments permit through their laws, policies, and regulations. Unfortunately, government practices still reflect the conditions of earlier times, restricting industry dialogue to a level well short of that needed for enlightened US-Japan cooperation on defense programs. US companies must go through elaborate "marketing license" procedures before they can even discuss the concepts underlying potential cooperative programs with Japanese counterparts. Japanese companies are not authorized by their government to undertake studies with US industry that are not part of established government programs. This combination of government policies and procedures actively discourages US and Japanese industry from even exploring possibilities for cooperation. "[6]

As seen here, Japan is left out of the current trend of joint projects among developed countries, and there are concerns that lack of participation in activities may adversely affect the technology level and production costs of defense equipment, and ultimately the overall security of Japan.[7] Given the current trend of severely restricting the transfer of most advanced technologies under licensing agreements, Japan finds it more difficult to have access to such advanced technologies. In other words, the Japanese defense industry and its technology base face more severe conditions than ever.

2. BMD and the Defense Industrial/Technology Base

Ballistic missile defense is one of the highest priorities Japan's national security and its defense policies as well as budget. BMD also has significant implications for Japan's defense industrial/technology base and can become a driving force for fundamental reforms. On the other hand, there are many issues that Japan needs to address, as described below.

1) Restrictions on Japan's Defense Budget

Ballistic missile defense requires the acquisition and support of various equipment, including weapons such as interceptors and their platforms, sensors like radar, Command and Control,

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[5] Masahiro Shigemura, "The Alleviation of the Arms Export Ban Policy and International Armament Cooperation," *DRC Annual Report 2003*, 2003, [http://www.drc-jpn.org/AR-8/shigemura-04j.htm] (in Japanese).
[6] Japan-US Industry Forum for Security Cooperation, "Joint Statement."
[7] Nippon Keidanren, "Future Development of Defense Power."

Battle Management and Communications (C2BMC) systems and support equipment, all of which have very advanced and costly capabilities.[8] Since FY 2004 when BMD acquisition was first budgeted, BMD has exceeded 10% of all JDA(now Ministry of Defense) procurement expenses for each fiscal year.

The National Defense Program Guideline (NDPG) revised in 2004 stated that Japan will develop capabilities for immediate responsiveness, mobility, flexibility and multi-role functions, supported by highly advanced technologies. However, current financial restrictions allow hardly any increase in defense budgets, and with the considerable funds allocated to BMD, it becomes increasingly difficult to procure equipment that can provide multi-functional, flexible and practical defense power. Moreover, the burden of two to three trillion yen that Japan is to bear for the realignment of US Forces in Japan may further impact budget allocations. Thus Ministry of Defense is reviewing its current Mid-term Defense Program (2005-2009), and considering further compression of the defense budget as a whole.

Given this situation, many factors could undermine the defense industrial/technology base as a whole, and impact unfavorably on industrial resources related to BMD. The North Korean missile launches of July 2006 will inevitably advance BMD development, but Japan faces threats other than ballistic missiles that require the development of various defense equipments. Therefore, depending on the security environment around Japan, the focus of defense spending may shift to "multifunctional, flexible and effective" capabilities rather than BMD. If there is no increase in defense budgets and expenses to support the realignment of US Forces in Japan increase, then the BMD budget may be reduced, further delaying the development of BMD systems. The industrial/technology base related to BMD could weaken rather than strengthen, even if this is a capability Japan must maintain for the future.

2) Joint Operations and Ballistic Missile Defense (BMD)

C2BMC is the core of BMD, supporting prompt and efficient operations of a Joint Task Force. For BMD operations, it is necessary to collect, process and analyze all information received from various sensors, determine which interceptor missiles to use, and make decisions on launches in accordance with emergency response procedures. Considering that medium-range ballistic missiles (MRBM) can reach Japan within 10 minutes, decision-making processes should be automated as much as possible. Moreover, BMD systems require real-time communication among component systems, so that further research and development effort in information technology is essential, including satellite communication and data links. The development of Tactical Data System (TDS) infrastructure to enable interoperability among the three

[8] Akio Shono, "How to Proceed with Defense Industries Policies," *DRC Annual Report 2003*, 2003 [http://www.drc-jpn.org/AR-7J/syouno-03j.htm] (in Japanese).

Self-Defense Forces (SDF) must be addressed immediately.

BMD systems consist of many subsystems and components, linked by systems integration techniques that optimize the capability of each component and coordinate their functions to maximize total capability. Such performance can be obtained only when sufficient know-how and experience in know-why accumulate through pursuing the best combinations of element technologies, so it is essential to have continuity in development experience.[9]

Technologies for sensors, C2BMC, communication infrastructure, and system integration that constitute BMD systems build on spin-offs from private sector technologies, so the pace of their development is quite fast. Incorporation and updates of such technologies will greatly contribute to BMD system capabilities. These technologies can also be applied to measures other than BMD, such as damage control from ballistic missile attacks or attacks on missile launch sites. Under the traditional acquisition process, each SDF Service developed its equipment plan, budget request, and maintenance provisions. However, Japan needs to develop a defense program based on integrated operation of three SDF Services. Their integration will be enabled by developing processes for the acquisition of integrated equipment, storage of resources, development and maintenance of production and technology bases, and accelerated procurement of priority capabilities.[10]

3) Technological Gaps between Japan and the US

The US has an overwhelming advantage in BMD-related technology and test capability over Japan and other countries, as it has invested tremendous amounts of money since the Cold War.

While BMD systems consist of many components (system of systems), Japan could participate only in development of the four missile components in the Joint Technology Research on Navy Theater Wide Defense (NTWD). Among the reasons why Joint Technology Research did not involve other matters was the fact of considerable technological gaps between Japan and the US in the fields of system integration and the core system of C2BMC, so that the US was rather reluctant to release technological data in these areas.

"To use a broad range of technologies that fully utilizes the most advanced resources of counterparts in joint research and development, it is necessary to bring our own technologies as bargaining power."[11] If the technological gap is too great, Japan cannot expect the US to provide technology support and bear financial burdens alone. As a result, imports from the US may

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[9] Research Committee on Defense Industrial/Technology Base, "Basic Direction on the Maintenance and Development of the Defense Industry and Its Technology Base," p.20.
[10] Akio Shono, "Defense Policies on the Procurement of Equipment," *DRC Annual Report 2005*, 2005, p.64.
[11] Research Committee on Defense Industrial/Technology Base, "Basic Direction on the Maintenance and Development of the Defense Industry and Its Technology Base," p.12.

increase. Given limited defense budgets, having considerable funds flow to the US means that Japan's defense industrial/technology base will have a smaller "piece of the pie," thereby further weakening it and expanding the technological gap between Japan and the US. This trend could further increase imports from the US, leading to a vicious spiral in the procurement of equipment.

The fact that Japan cannot implement BMD tests domestically further opens its technological gap with the US. Without tests using actual BMD systems, it is difficult to obtain sufficient performance data. Unless such data can be built-up domestically, it is not possible to obtain sufficient design information to improve imported systems and design next generation replacements, thereby further increasing dependency on the US.

Since SDI, the US has invested over 20 trillion Yen on missile defense, while Japan has just started an investment of only one twentieth that amounts. Considering this fact, it may be difficult to narrow the technology gap between two countries, but public and private sector interests should share recognition of this gap, and make efforts to reduce it on BMD systems.

Japan's dependence on the US for much of the development, production, and improvement work on its BMD system makes it extremely difficult to obtain self-sufficiency. For Japanese BMD items developed by the US, the following problems could raise:

- The time would be needed to implement transfers from the US;
- Although the system is continuously updated in the US, Japan may end up with an older version that is not updated;
- "Black boxes" in the system prevent complete test, evaluation, and maintenance work in Japan, and maintenance may be time-consuming;
- Due to conditions in the US, a 'final buy' may be required at an early stage of acquisition, so Japan (especially industry) may need to hold considerable inventory;
- In any emergency, the US situation will always be given priority over Japan, so exports could be delayed, or even blocked.

To resolve these issues, Japan needs to argue at every opportunity that Japan's BMD capability serves the US interests. The Japanese Government and defense industries should also make efforts to address disadvantages in technological capabilities.

Development of systems with the involvement of the US, such as BMD, raises other concerns as well:

- Japan may not obtain all data needed for system design (such as threats and interception requirement), so the system will be designed on what could be doubtful assumptions;
- Japan cannot test a complete system in its territory, unlike the US which has large and advanced facilities in the South Pacific to acquire data on the launch and interception of

ballistic missiles. To build a facility with same capabilities would be extremely difficult for Japan, so even if Japan could develop a system without the cooperation of the US, it would still need the US support for the acquisition of analytical data.

It may not be practical for Japan to aim for self-sufficiency in BMD system development, but Japan should promote indigenous BMD efforts by sharing measurement data already analyzed by the US through participation in US test and analysis activities. Moreover, Japan's introduction of an indigenous high performance ground-based radar, and subsequent the US reliance on such Japanese BMD capability will increase interdependence on system analysis. This would be one of the ways to narrow a technological gap.

4) Japan-US Cooperation

Strict application of Japan's arms export restrictions has been a barrier to joint development and production of defense equipment. A Statement of the Chief Cabinet Secretary issued with the revised National Defense Program Guideline in December, 2004, noted, "[i]f Japan decides that it will engage in joint development and production of ballistic missile defense systems with the US, however, the Three Principles will not be applied, under the condition that strict control is maintained, because such systems and related activities will contribute to the effective operation of the Japan-U.S. security arrangements and are conducive to the security of Japan."

Although exports of BMD products are literally limited to the US, the fact that the Japanese Government has revised its application of the Three Principles on Arms Export is quite significant. Not only could effective work sharing and mutual usage of production lines for SM-3 (or PAC-3) become possible, but Japan and the US could also support each other in cases where one country experiences sudden increases in demand or reduction of production capacity. For Japanese defense industry, there will be opportunity to deliver products to the US as well as Japan, and thus benefit from more cost-effective production. Naturally, defense-related exports should continue to have some degree of control; in particular, third party transfers should be undertaken with great care.

Revised application of arms export restrictions is a favorable development for Japan-US cooperation, but other issues remain. For example, dialogue on specific projects without thorough discussion on appropriate terms for joint development could result in increased dependence and subordination of Japan toward the US, inhibiting independent thinking on the development or operation of BMD systems in Japan. Data-sharing concerns in particular could increase such tendency toward dependence. Given the technological gap between Japan and the US, it is inevitable that the US views Japan as being less experienced and lacking credible operational data

as well as funding resources, thus obstructing development of its own software.[12]

Cooperation between Japan and the US on BMD systems has focused on technologies related to missiles and their platforms; discussion of C2BMC has hardly begun. Currently there is no common understanding on development of C2BMC, so that technologies for exchange have not been identified. One of the reasons for this is insufficient discussion on the development of joint operational plans and procedures for BMD.

Japan-US defense industrial cooperation is limited due to policy and regulatory restrictions as discussed above, a situation that impacts unfavorably on overall BMD cooperation. Even if Japanese and US companies want to explore possible cooperation outside the framework of agreed projects, discussion would be limited to public information. The Framework Memorandum of Understanding (MOU) on Japan-US BMD cooperation does not allow industry to exchange views on BMD projects except those authorized for Aegis BMD systems (and then only between the prime contractors), so industry has no incentive to recommend beneficial proposals.

5) Information Collection Capability

At present Japan does not have early warning satellites equipped with infra-red sensors, and the resolution of its information gathering satellites is much less than those of US spy satellites. Therefore, Japan has to rely on the US for much of its pre-launch intelligence as well as early warning information. The US, on the other hand, wants to obtain sensor information gathered in Japan as it is closer to North Korea and other regional countries.

This seems to be an interdependent relationship, but that is not really the case. While the US has already developed a comprehensive system to gather information required for the BMD operations, Japan lacks information collection capability for early warning, and information obtainable through other sensors is not better than that of the US. This gap in information collection capabilities raises the following concerns. First, if Japan and the US exchange information on the basis of equivalence instead of transferring all information available, then Japan may not be able to have all the information it needs from the US. Second, if the US provides sufficient information to Japan, Japan's dependence on the US becomes excessive, obstructing its interests in independent BMD operations. To receive sufficient information from the US while maintaining independence in BMD operations, Japan must develop an advanced level of information collection capability.

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[12] Masahiro Matsumura, "The International Politics of Datalink: Prescribing Japan's Policy for Alliance Management," *The Journal of International Security*, Vol.31, No. 3 (December 2003), p.19(in Japanese).

6) Spiral Development

The SM-3 Block IA Japan will introduce initially is to be upgraded through the US "spiral development"approach to acquisitions.[13] Spiral development aims to introduce weapons systems that are not fully matured, and gradually develop such equipment by adapting to changes in threats, absorbing operational experience, and incorporating new technologies where appropriate. As it will be some time before Japan introduces the upgraded SM-3 (Block IIA), Japan may need to improve early SM-3s phase by phase, or acquire upgraded Block 1 SM-3s to remain effective against ballistic missile threats and ensure interoperability with US BMD forces. However, such upgrades would require additions to the originally assumed budget, and it may become necessary to store stocks of spare components for earlier SM-3 versions, which would complicate training and logistic activities.

One notable characteristic of Joint Development of SM-3 Block IIA is Japan's adoption of a spiral development approach. Although Japan expected to start Joint Research tests in 2006, it decided to implement Joint Development in December 2005, stating that there is a good prospect of overcoming initial technological problems. This reflects a spiral development approach. Spiral development is an extremely effective acquisition method for R&D, introduction, and improvement of advanced capabilities such as BMD. However, Japan must consider how to integrate spiral development practices into current Ministry of Defense budget and procurement procedures. Such efforts must also address criticism, not only in the US but also in Japan, that the initial BMD system is not sufficiently developed.[14] Moreover, under the spiral development approach, the final form of a weapon system is not apparent at the initial stage, so that it is difficult to estimate the total budget. With the possibility of excessive demand from users, it is quite possible that costs will become much more than originally planned. For Japan-US joint development, both countries need to review the objectives and terms of work for each stage of the program, and to determine appropriate cost-sharing for each country.

7) US Policy Changes

Commitment by Japan and the US to a long term project always faces the risk of policy changes by a new US administration. While the Republican and Democrat parties agree on the promotion of BMD, they differ on the pace of promotion, and which systems should be prioritized. Bush Administration policy to actively promote BMD actually accelerated Japan's BMD planning. On

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[13] MDA listed the targets for Block 06, such as: increasing Block 04 capabilities; addition of limited capability to intercept long-range ballistic missiles; and improved Aegis BMD performance as remote sensors. See Ronald T. Kadish, Director, Missile Defense Agency, "Missile Defense Program and Fiscal Year 2004 Budget," before the Senate Armed Services Committee, March 18, 2003; General Accounting Office, *Missile Defense: Actions Are Needed to Enhance Testing and Accountability*, GAO-04-409 (April 2004), p. 41.

[14] See, for example, Philip Coyle, "Is Missile Defense on Target?" *Arms Control Today*, Vol. 33, No. 8 (October 2003) [http://www.armscontrol.org/act/2003_10/Coyle_10.asp]. He criticized the US decision on missile defense deployment for 2004-2005 as the introduction of an underdeveloped system with insufficient tests. For PAC-3, also, there was criticism that there were no tests using Scud missiles, or actual use in combat.

the other hand, the Bush Administration decided to cancel the development of Navy Area Defense (NAD). Although such a change may have been a relatively minor one for the US, it could have had a significant impact on a program partner. As noted above, Bush Administration use of a spiral development approach to acquisition could also have significant effect on the development and procurement practices of a joint project partner.

The Bush Administration also changed NTWD to "Aegis BMD" and removed the distinction between Theater Missile Defense (TMD) and National Missile Defense (NMD). Its decision to acquire initial (13.5 inch airframe Block 0-I) versions of SM-3 for Aegis BMD was linked to spiral development of upgrades; this became the basis of the US offer of Sea-Based BMD to Japan. On the other hand, initial US reluctance to adopt a larger (21 inch airframe, now Block II) version of SM-3 questioned the significance of having a Japan-US project. There may be further US changes in missile defense policies that could impact work with Japan; thus Japan must consider how to reduce such risks in the future.

3. Future Measures

1) Defense Industry and its Technology Base

To reinforce ballistic missile defense capabilities, Japan must strengthen its BMD-related defense industrial/technology base. At the same time, such action must proceed in balance with other areas of industrial/technology capability. Defense budgets are not likely to increase for some years, and BMD system development will demand more funds in the future, even as Japan is asked to bear substantial expense for the realignment of US Forces in Japan. If BMD is the most critical issue for Japanese national security policy, it may be necessary to exert to more political pressure for funding, as well as consider the possibility of supporting BMD programs through a special national budget.

Japan also needs to consider how it can support its defense industry and its technology base within limited budgets. One of the ways could be to establish a joint facility for PAC-3 or SM-3 support in Japan, where Japanese companies can service equipment owned by both Japan and the US.[15] This would not only help maintain the technological level of Japanese defense contractors, but also benefit US missile defense deployments in and around Japan, since the missiles would not need to return to the US for maintenance. For the upgraded SM-3 (Block IIA) being co-developed by Japan and the US, both sides must cooperate to complete development and smoothly proceed to joint production. Japan should discuss production matters with the US from an early stage of development to obtain for Japan production of components other than those it is to develop, as well as the assembly of complete missiles.

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[15] See, for example, Fumio Kyuma, "Keynote Address at the Sixth Japan-US Security Strategy Meeting," 2005 (in Japanese).

On the other hand, Japan should consider how to contribute to US MD capability through cooperation on developing Japan's BMD system, while maintaining Japan's operational independence. Since BMD is a high priority issue for both Japan and the US, it may be possible to gain US cooperation. However, Japan should make every effort to develop capabilities for information gathering, C2BMC, and data-linking, and thus avoid over-dependence on the US.

Certainly, such technological capability cannot be obtained overnight. For the moment, it is more practical for Japan to provide component technologies that can contribute to the US MD system, further develop an interdependence, request technology transfers from the US, and gradually strengthen Japanese technological capabilities. There is a particular need for continuity in development experience in the area of systems design and integration. While ultimately targeting systems integration of BMD as a whole, Japan needs to raise its technological level to enable the integration of individual components and subsystems in a BMD system.

2) Promotion of Technological Exchanges on C2BMC

To promote technology cooperation on C2BMC it will be important to thoroughly understand each other's systems and methods through active exchange exercises. It may be possible to incorporate Japanese companies into FMS contracts. Or, companies and research institutes in both countries could support each other's systems development under a SETA (system engineering technical assistance) Agreement,[16] with configuration and confidentiality controls required for Japan-US cooperation.

3) Establishment of M&S Center

Japan's BMD development will progress with the Ministry of Defense taking on a central role in planning, integration of research and development work, and decisions on policies and operation. Public and private sector interests in Japan should acquire comprehensive M&S (Modeling & Simulation) capabilities and establish an organization that can effectively use such resources to support Ministry of Defense efforts.

In the US, the JNIC (Joint National Integration Center), which directly reports to the Director of MDA, performs systems integration and interoperability measures that cannot be implemented at Service levels, and develops plans for comprehensive BMD operations. Specifically, the JINC : ① carries out development, procurement, and deployment analysis of MD system; ② supports integrated missile defense doctrine and operational plan development; and ③ uses integrated simulation and war games to support the MD plan and systems integration of BMC4I. The use of

[16] Private sector and neural expert organizations that supports the use requirement, designing, and assessment from the viewpoint of experts, and support the government in technological and management aspects.

M&S, with which the US still has considerable problems, is an essential function in the development of MD systems.[17] In the United Kingdom, the Missile Defense Centre (MDC) was established in 2003 through government-industry cooperation. The main purpose of this Centre is to promote the participation of British companies in the US MD program, and incorporates M&S as a way to link with the US JNIC. In NATO, NC3A (NATO Consultation, Command and Control Agency) has the M&S capability to support NATO activities.

Japan also must implement M&S to build the most appropriate and effective BMD system for its requirements. To implement such M&S capability, it will be "necessary to have simulation interfaced with real world systems to support real-time decision-making and thus make training more effective."[18] Furthermore, Japan needs the US to share as much as possible the measurement data it has already acquired and analyzed through tests of BMD interception. It will also be useful to integrate simulation software in operational equipment.

Thus, Japan needs its own M&S capability to build a truly effective BMD system. Japan should establish a M&S Center like the US JNIC or UK MDC through the cooperation of government and industry, and with association with the US.

4) Building an Early Warning System

Japan will import an Unmanned Aerial Vehicle (UAV) system from the US in 2007. This UAV will be equipped with image collection and infrared sensors to detect ballistic missile launches. In November 2005, the MSDF UP-3C multipurpose aircraft equipped with "air boss" (infrared detection equipment for high-altitude operations under development at Technical Research and Development Institute of the Ministry of Defense) participated in a US ballistic missile interception test and succeeded in detecting and tracking exercises.[19] During the North Korean missile launches in July 2006, electronic intelligence aircraft such as the MSDF EP-3C and ASDF YS-11E collected and analyzed information along with US Forces and significantly contributed to task force readiness. This is important in terms of Japan understanding the essential role of information collection systems. Japan is to consider the introduction of aircraft for collecting missile launch data, such as the RC-135 used by US Forces, but as aircraft systems may have limited capability, Japan also needs to examine the acquisition of early warning satellites.

Japan is prohibited to use space for military purposes under the "Resolution on the Peaceful Use of the Space" passed by the Diet in 1969, but internationally the use of space for defense purposes

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[17] About the situation of M&S related to missile defense in the US, see Defense Science Board Task Force, *Missile Defense Phase III: Modeling and Simulation*, Office of the Undersecretary of Defense for Acquisition, Technology, and Logistics, March 2004.
[18] Hiroshi Ikawa "Baseline Assessment of Modeling and Simulation (M&S)," *DRC Annual Report 200*', 2001 [http://www.drc-jpn.org/AR-5J/ikawa-j.htm] (in Japanese).
[19] *Sankei Simbun*, November 19, 2005.

is now widely accepted. There has been discussion on revision of Japan's space policies in the direction of the international community. For UAV and early warning satellites, import from the US seems practical at present, but Japan and US should find room for Japanese industry to play a role in these programs.

5) Expansion of Japan-US Technology Cooperation

Along with joint development and future production of the SM-3 Block IIA, Japan should explore additional opportunities for joint R&D related to BMD, and begin studies on next generation systems. Defense against cruise missiles or SRBMs launched from off-shore container ships, which are drawing attention as new threats, could be important subjects for such studies. Studies for next-generation systems could include the addition of ballistic missile interception capability to mid-range air defense missiles (like the Japanese Chu-SAM) by retrofitting appropriate radar and guidance equipment. Future Chu-SAM could be a project on which Japan takes the initiative for joint development and production.

Although close cooperation with the US is inevitable, maintaining independence in the development of BMD capabilities will require Japan to further develop technologies in various BMD system areas and systems integration, as well as capability to operate a BMD system. In the face of budgetary and technological constraints, Japan needs to choose appropriate systems, as well as support related defense industrial/technology capabilities, and concentrate resources into selected areas. For this, Japan needs to determine clear policies for "selection/concentration" and "produce/purchase" on the following points:

- What equipment Japan can renounce or reduce?
- What are the systems and technologies Japan needs to develop on its own to maintain its defense industrial/technology base? What equipment should be imported?
- What are the technological fields where Japan has an advantage, and for what equipment does Japan need to distribute production with regard to supply from the US? What should Japan approach work sharing arrangements?
- What would be the ideal model for cooperation between Japan and the US? In particular, what roles should Japan seek?

Given rapid advances in technologies, the Japanese government must provide strategic support to develop key technologies, while incorporating the views of its defense industry. If Japan-US joint R&D, production, and operations can complement such efforts by Japan, it becomes possible to have a favorable cooperative relationship on BMD and respond effectively to ballistic missile threats.

BMD is a large scale system that cannot be built solely by Japan. It is inevitable to have cooperation with, and imports from the US. For a policy of "selection and concentration," Japan

must "identify core areas based on needs that reflect future defense program, and technologies needed to gain superiority in future combat. Moreover, Japan needs to maintain industrial capabilities that are irrecoverable once lost, since these are essential for BMD and have no use other than for defense purposes."[20] Ensuring independence in BMD operations will continue to be an important consideration in fields related to information collection and decision-making (technologies for sensors, network and data-linkage, C2BMC, and space usage). These are areas where spin-offs from private sector technologies can be expected, and areas where Japan has strength. In view of participating in the US MD system, it is increasingly important to search for technologies applicable to BMD in which Japan has superiority relative to other countries.

If Japan can develop clear policies and strategies in the areas discussed above, it can independently propose subjects for joint development as well as appropriate roles Japan can take. Until now, cooperation with the US has been a relationship of supplier (US) and customer (Japan), but this can be changed to more of a partnership on equal footing.

To further promote Japan-US cooperation in the development and production of BMD systems, Japan must adopt some legal and regulatory measures. Agreement on a MOU to enable comprehensive interaction between Japanese and US industries would be a first step in this direction. Conclusion of a General Security of Military Information Agreement (GSOMIA) between Japan and the US would help ensure a credible system for the protection of sensitive defense information. Japan should also strengthen public-private sector cooperation, and make better use of private sector creativity. Japanese government encouragement of active dialogue between Japanese and US industry, and its willingness to consider proposals on cooperation projects, would be a strong incentive for defense industries to undertake such initiatives. Efforts to strengthen Japan's defense industrial/ technology base should maximize the use of technologies from industry and research institutes whose staff often are unaware that their resources have potential application to security purposes, and build effective linkages among industry, academics, and the public sectors.

[20] Meetings on Strategy to Procure Defense Equipment, "Toward the Procurement of Equipment for a New Age," p.20.

Chapter 13 Responses to Cruise Missiles

1. Proliferation and Increasing Threat of Cruise Missiles

1) Proliferation of Cruise Missiles

As described in Chapter 1, cruise missiles approach targets by flying through the atmosphere. They can be classified by targets as Anti-Ship Cruise Missiles (ASCM), and Land Attack Cruise Missiles (LACM), or by launch platform such as Air-Launched Cruise Missiles (ALCM) and Ship-Launched Cruise Missiles (SLCM).

Over 80 countries have cruise missiles at present, and 18 of these countries can manufacture them. There are over 100 different types of cruise missiles, including derivatives, with an estimated total of 70,000-80,000 missiles in existence. Russia is said to be the most important player in terms of cruise missile proliferation.[1] High-performance cruise missiles are valuable export products for Russia; for example, it has exported the SS-N-22 to China, with Sovremenny-class destroyers as platforms. Continued Russian exports of cruise missiles and related equipment and materials as well as technologies will accelerate the proliferation of such weapons around the world. Former Soviet countries have also exported cruise missiles and related products. The Kh-55s ALCMs left in Ukraine were reportedly exported to Iran and China illegally and there is concern that even North Korea may have received them.[2]

China continues to build up its cruise missile inventory, with the planned deployment of an upgraded "Ying Ji" ALCM (with a 400-500 km range) within 2 to 3 years, and tests of an upgraded "Hong Niao" LACM (with a 2500 km or greater range) were conducted in August 2004. According to a US assessment, China is likely to possess several hundred LACMs with greater accuracy by the year 2015.[3] Taiwan, which is strongly concerned by China's military build-up, tested its ASCM "Xiong Fu 2E" (1000 km range) in June 2005, and has since begun deployment.[4] In addition, Pakistan tested its "Hatf" cruise missile (500 km range) which has a rather short range but can carry nuclear warheads.[5]

2) Factors Accelerating the Proliferation of Cruise Missiles

The primary factor behind the proliferation of cruise missiles is their low expense compared to ballistic missiles. For example, $50 million allows the purchase of 1 or 2 advanced tactical

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[1] Thomas G. Mahnken, *The Cruise Missile Challenge* (Washington D.C.: Center for Strategic and Budgetary Assessments, 2005), p. 18.
[2] Andrew Feickert, "Missile Survey: Ballistic and Cruise Missiles of Selected Foreign Countries" *CRS Report for Congress*, RL30427 (Updated July 26, 2005), p. 9.
[3] Lowell E. Jacoby, Director, Defense Intelligence Agency, "Current and Projected National Security Threats to the United States," Statement for the Record, Senate Select Committee on Intelligence, 16 February 2005.
[4] *Yomiuri Shimbun*, August 13, 2005 (morning edition).
[5] *Yomiuri Shimbun*, August 12, 2005 (morning edition).

fighters, 15 theater ballistic missiles with 3 launchers, or 100 cruise missiles.[6] Also, the technologies required to develop and manufacture cruise missiles are more easily accessible than those of ballistic missiles.[7] Formerly, the difficult parts of building cruise missiles were the navigation, guidance, and propulsion systems, but recently such obstacles have diminished.

The most advanced US LACM, "Tomahawk," is equipped with navigation systems such as Terrain Contour Matching (TERCOM) and Digital Scene Matching Area Correlation (DSMAC). As these systems rely on precision mapping obtained from secret reconnaissance systems, it is reportedly difficult to export them. On the other hand, due to the widespread use of GPS, it has become easier to produce effective navigation systems that are less expensive than the high precision and stand-alone Inertial Navigation System (INS). Since GPS could become unavailable in emergencies if the US sets the system to allow only the use of equipment with military specifications, there are efforts to develop satellite-based ground positioning systems that do not rely on GPS.[8] For propulsion, turbojet engines widely used in airplanes can be easily converted for use in cruise missiles.[9] In short, cruise missiles can be developed and manufactured with more readily available dual-use technologies than can ballistic missiles.

It is obviously more difficult to implement effective export controls for cruise missiles. There is no consensus among Missile Technology Control Regime (MTCR) members on cruise missile controls. Many materials, equipment, and technologies used for cruise missiles can also be used for various purposes. Due to the structural characteristics of cruise missiles, it is difficult to accurately identify the ranges and payloads of completed missiles; furthermore, lists of controlled items cannot keep up with technology developments.[10] In addition, cruise missile items and technologies are embedded in the aviation industry. The US, a primary exporter of advanced aviation systems, is not fully active in promoting strengthened export controls over cruise missile-related products. Some observers point out that strict export controls on GPS, propulsion, and/or flight control systems might cause a loss of property rights within the aviation industry.[11]

Export controls over cruise missiles can hardly be described as being strictly implemented as in the case of ballistic missiles. Under the MTCR, Category 1 missiles requiring very strict export controls have ranges of 300 km or longer and payloads of 500 kg or greater. Since the range and payload capabilities of cruise missiles are difficult to identify, they may hence provide a loophole

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[6] Adam J. Hebert, "Cruise Control," *Air Force Magazine*, Vol. 85, No. 12 (December 2002), p. 43.
[7] Loren Thompson, "Cruise Missile Defense: Connecting Theater Capabilities to Homeland Needs," *White Paper* (Lexington Institute), December 31, 2004, p. 7.
[8] For example, China participates in the EU Galileo satellite navigation program. Thus there is concern that China could use Galileo-based GPS for its cruise missiles.
[9] Dennis Gormley, "Addressing the Cruise Missile Threat: Defense and Diplomatic Responses," *Proliferation Papers*, Spring 2002, pp. 5-6; Hebert, "Cruise Control," pp. 43-44.
[10] Dennis M. Gormley, "Prepared Statement," Hearing of the International Security, Proliferation and Federal Services Subcommittee of the Senate Governmental Affairs Committee, February 12, 2002.
[11] Hebert, "Cruise Control," p. 45.

for exporters. Furthermore, countries capable of manufacturing cruise missiles, such as Brazil, China, India, Iran, Iraq, Israel, and North Korea are not members of the MTCR. This is another factor that accelerates the proliferation of cruise missiles.

As cruise missiles are less costly, it is easier to use them for saturation attacks. Being generally smaller than ballistic missiles, they have greater stealth and mobility. As cruise missiles have low signatures and fly at low altitudes, ground- or ship-based sensors can detect them at only short distances. Even in the case of monitoring by aircraft-based sensors, cruise missiles can be difficult to detect due to ground clutter. Improved stealth technologies and use of deception techniques like chaff and decoys make the detection of cruise missiles even more difficult.

Generally cruise missiles are very accurate, so they can be used for attacks on key facilities such as nuclear power plants or chemical factories. Therefore, even if their warheads have less impact, cruise missiles can still do great damage. In comparison to ballistic missiles that fly into space at supersonic speed, cruise missiles flying in the atmosphere at lower speed require less maintenance work on the material in their warheads, so they are useful for delivery of WMD payloads, especially biological and chemical weapons. As cruise missiles can be launched from various platforms, terrorist groups could attack coastal areas using cruise missiles concealed on container ships.[12]

No effective Cruise Missile Defense (CMD) system has been established, and development efforts to build such a system are far behind those of BMD. Once more effective BMD systems are established, those countries and non-state actors seeking missile attack options may become more interested in cruise missiles.[13]

2. Cruise Missile Defense (CMD)

1) Current Status of CMD in Japan and the US

In response to the Defense Authorization Bill of 1996, the US Defense Department has developed several CMD proposals. For example, the Army is developing the Joint Land Attack Cruise Missile Defense Elevated Netted Sensor System (JLENS), which is a balloon the size of a football field equipped with various sensors and communication systems for airborne detection and tracking of cruise missiles. This system is to be deployed from 2010. Introduction of the Surface Launched Advanced Medium Range Air-to-Air Missile (SLAMRAAM) with CMD capability is

[12] See, for example, the United States of America, *The National Strategy for Maritime Security*, September 2005, p. 8.
[13] About the characteristics of cruise missiles, see Gormley, "Addressing the Cruise Missile Threat," p. 5; Mahnken, *The Cruise Missile Challenge*, pp. 32-33.

scheduled for 2008.[14] The Army is also working on less expensive cruise missile interceptors with a range of 50 miles and equipped with active sensors.

The Navy is approaching CMD through the introduction of Cooperative Engagement Capability (CEC) on Aegis ships and E-2C Hawkeye early warning aircraft. The Air Force already has AWACS (Airborne Warning and Control System) aircraft and Advanced Medium Range Air-to-Air Missiles (AMRAAM).[15] The US is also developing CMD capabilities through the Joint Theater Air and Missile Defense Organization (JTAMDO), Single Integrated Air Picture (SIAP), Joint Combat Identification Evaluation Team (JCIET), and Integrated Fire Control (IFC) systems.[16]

However, US CMD capabilities are still limited. The PAC-3 system requires further development for effective interception of cruise missiles.[17] The US Navy has the most extensive experience in defense against low-altitude air attack,[18] but still lacks effective capability against high-performance ASCMs.[19] Except for study of BMD/CMD applications for the Medium Range Extended Air Defense System (MEADS) under development by the US, Germany and Italy, each US service is proceeding with separate CMD measures.

Japan's Type 03 medium-range air defense missile (Chu-SAM) reportedly has capabilities against aircraft, air-to-ground missiles (including those that can dive at sharp angles), and cruise missiles. The MSDF has deployed various weapon and electronic warfare systems to achieve comprehensive air/missile defense capabilities. The ASDF has some look-down and shoot-down capability, but has yet to acquire the means for defense against land attack cruise missiles.

2) Difficulties posed by CMD

The interception of cruise missiles involves detection, tracking and identification of incoming cruise missiles, and finally interception. In addition, following identification it is possible to cue sensors and other systems on the course of an incoming missile's flight. Although the process of CMD is basically that of BMD, there are huge differences in technologies as well as operations, so that improvements in BMD will not necessarily lead to a strengthening of CMD capability.

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[14] Larry J. Dodgen, Commanding General, U.S. Army Space and Missile Defense Command and U.S. Army Forces Strategic Command, "Statement," Before the Committee on Armed Services, Strategic Forces Subcommittee, United States House of Representatives, March 15, 2005.
[15] Thompson, "Cruise Missile Defense," pp. 16-21; Mahnken, *The Cruise Missile Challenge*, pp. 43-44.
[16] Ravi R. Hichkad and Christopher Bolkcom, "Cruise Missile Defense," *CRS Report for Congress*, RS21921 (Updated May 2, 2005), pp. 3-5.
[17] Andrew Feickert, "Missile Survey: Ballistic and Cruise Missiles of Selected Foreign Countries," *CRS Report for Congress*, RL30427 (Updated July 26, 2005), p. 24. Theoretically, PAC-3 has a capability to intercept cruise missiles flying in at the lower altitude, but they will not be able to discover such missiles unless they are within 35 km range, due to the horizon limit of radar. Dennis M. Gormley, "Testimony," Before the Subcommittee on National Security, Emerging Threats, and International Affairs of the U.S. House of Representatives Committee on Governmental Reform, March 9, 2004 [http:// cns.miis.edu/research/ congress/ testim/testgorm.htm].
[18] Thompson, "Cruise Missile Defense," p. 16.
[19] Mahnken, *The Cruise Missile Challenge*, pp. 18, 41.

CMD more resembles air defense (though on a differing scale) than BMD. Ballistic missiles rely on inertial flight through space and have hypersonic terminal velocities. Cruise missiles, on the other hand, fly through the atmosphere, usually at sub- to trans-sonic velocities (though supersonic cruise missiles have appeared recently); thus their flight characteristics resemble those of aircraft rather than ballistic missiles.

Because cruise missiles are slower than ballistic missiles, their interception upon target confirmation seems not too difficult. However, detection, tracking, identification and interception of cruise missiles is in fact more difficult than is the case with ballistic missiles.[20] As noted above, it is not easy to detect cruise missiles, and because of their maneuverability, which ballistic missiles lack, it is more difficult to identify their targets and then track the missiles for cueing operations. Moreover, because of their flight altitudes and courses, as well as radar images, one could mistake cruise missiles for aircraft. In addition, in the case of combined cruise and ballistic missile attacks, air and missile defense systems will face the difficulty of simultaneously responding to high- and low-altitude threats.[21]

Another difficulty in building an effective CMD system is the shortness of time from cruise missile launch to impact (ten minutes in the case of a 100 km range missile), thus requiring the execution of processes from detection to interception in a very brief period. There may seem to be little difference in flight time compared to a North Korean No Dong ballistic missile. However, unlike ballistic missiles launches that can be detected and cued by early warning satellites, cruise missiles are likely to come close to their targets before being detected, so reaction time will be much less. In other words, CMD requires the building of an extremely automated system to enable real-time decision-making.

The fact that cruise missiles can use various types of platforms indicates that monitoring and warning systems should be set at a much broader scope than those for BMD. Japan's geographical features means that attacks can be made from any direction. Therefore, Japan must build a monitoring and warning network for CMD that covers its entire territory.

In addition, the interception process itself presents different challenges from those of BMD. As described before, lower-cost cruise missiles encourage saturation attacks. Confronting such attacks will require a highly cost-effective defense system to ensure a sufficient quantity of

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[20] US CMD capability is deficient in monitoring networks to detect and track cruise missiles, in quick identification of unknown flying objects, and in the fire control system of integrated combat systems. Thompson, "Cruise Missile Defense," p. 13; Hichkad and Bolkcom, "Cruise Missile Defense," p. 3.

[21] Gormley, "Addressing the Cruise Missile Threat," p. 13; Christopher Bolkcom and Sharon Squassoni, "Cruise Missile Proliferation," *CRS Report for Congress*, RS21252 (July 3, 2002), p. 4; Mahnken, *The Cruise Missile Challenge*, pp. 42-43.

interceptors and thus a credible capability. In addition, it is necessary to consider that, especially in the case of cruise missiles with WMD warheads, the need to neutralize warheads and mitigate fall-out damage could be even greater than with the case of BMD.

As cruise missiles fly at lower velocities in the atmosphere, kinetic warheads used for BMD may not provide sufficient energy to destroy cruise missile warheads. Even if such kinetic warheads "hit" nuclear warheads on cruise missiles, the destructive energy may not be sufficient to damage the ignition devices or molded fissile materials within the warheads and thus prevent a nuclear explosion. (In the case of BMD, a direct hit would instantly destroy the ignition apparatus due to the energy from hypersonic velocities.) For similar reasons, biological or chemical warheads may cause damage unless sufficient thermal energy is imparted to toxic agents in the warheads to make them harmless at the instant of interception.[22]

3. Future Measures against Cruise Missile Attacks

1) Building an Effective CMD System

An effective CMD system will require an air defense network more densely distributed than that for a BMD system, and C4ISR systems automated to allow the shortest possible response time (similar to the C2BMC system needed for control of BMD operations). Implementation of CMD will require the following measures: collection and distribution of relevant information; surveillance over as broad an area as possible; continuous monitoring of potential attack routes; rapid identification of threats; continuous, all-weather tracking of potential threats; strengthened capabilities to enable interception at harmless locations as far away as possible from intended targets (such as over water); and systems integration as well as linkage to the SDF and other relevant organizations.[23]

The critical part of the above process is the building of a sensor network that enables effective detection, tracking and identification of cruise missiles. High-powered sensors used for BMD are not necessarily required for CMD. Due to the horizon limit of radar, low-altitude objects such as cruise missiles cannot be detected until they get closer to their targets. Rather, CMD will require the development of networks to continuously distribute information through deployment of less expensive sensors over as wide an area as possible.

Also, development of technologies to eliminate obstruction from ground clutter will enable look-down operations from airborne sensors. Installation of sensors to monitor cruise missiles on existing SDF aircraft such as P-3Cs or E-2Cs would allow them to be used for continuous

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[22] In case of ballistic missiles defense, especially when interception is made in outer space, it is possible to significantly reduce the probabilities of receiving damage from fall-out.

[23] Gormley, "Addressing the Cruise Missile Threat," pp. 14-17; Thompson, "Cruise Missile Defense," pp. 10-12.; Charles E. Lambert, "The Cruise Missile Conundrum," *Aerospace America Online*, (February 2003)[http://www.aiaa.org/aerospace/Article.cfm?issuetocid=309&ArchiveIssueID=35].

surveillance of cruise missile threats in the seas and airspace surrounding Japan. Not only SDF but also Coast Guard and air control radars can be used to obtain information needed to detect cruise missiles. It is even possible to detect dispersion waves reflected from cruise missiles when struck by waves emitted from FM radio stations throughout Japan.

Sharing surveillance information will require either strengthening existing networks or building new ones. In this case there is no need to centralize C2BMC systems as in the case of JADGE, which the ASDF is developing for both BMD and air defense. Given significant improvements in computers and communication network capabilities, current information collection and control systems tend to be less centralized, relying on a network of distributed systems. As CMD requires very short response times (like BMD, though for differing reasons), its C2BMC capabilities need to be more distributed than those for existing air defense systems. Also, the MSDF needs a CEC network to enable distribution of sensors and shooters.

Another option for Japan could be to add CMD capability to conventional mid-range SAMs. Mid-range SAMs can be given increased velocity as well as side thrusters to improve maneuverability. In addition to improved performance, another challenge will be development of lower-cost interceptor missiles for response to saturation attacks.

Other options for using existing assets may include interception of cruise missiles using air-to-air missiles fired by F-15 fighters, or fire from traditional air defense artillery. Rather than such "hard kill" measures, however, it may in fact be more effective for local or area defense to use "soft kill" techniques such as disruption of missile flights through jamming navigation systems.

Since cruise missiles can be launched from various types of platforms, the ultimate goal for CMD is to deploy surveillance sensors and interception systems over the entire area of Japan. Considering the high accuracy of cruise missiles, an enemy country or non-state actor using them is likely to plan pin-point attacks on a specific target, so it is necessary to defend key points such as important infrastructures or urban political and economic centers.

2) Promotion of Cruise Missile Defense

At present, BMD is one of Japan's highest defense priorities. Since first budgeted in 2004, the portion of BMD in overall defense acquisition expenditures continues to exceed 10% each year. Without increases in overall defense budgets, it may be difficult to add significant funding for CMD. However, the threats Japan faces now are mostly from ballistic missiles, and it will be some time before serious threats from cruise missiles become evident.

For the moment, placing priority on BMD is appropriate for Japan. Of course cruise missile threats are likely to increase, and Japan should begin development of CMD systems as soon as

possible. Gradual strengthening of air defense capabilities against cruise missiles would be a realistic option. To utilize limited budgets and assets more efficiently, Japan should consider the possibility of building CMD capabilities interoperable with BMD and existing air defense systems. In addition, as in the case with the 5Ds of BMD, Japan should seek comprehensive measures for CMD that incorporate dissuasion, deterrence, denial, defense capabilities and damage confinement.

Measures for dissuasion diplomacy could include the strengthening of export control regimes such as MTCR and the Wassenaar Arrangement, and the prevention of further proliferation to rogue states or non-state actors through the Proliferation Security Initiative (PSI). The deterrence element of CMD could be based on multi-layer defense measures covering offensive defense (denial capability), active defense (defense operations) and passive defense (damage confinement).

Offensive defense measures to preempt cruise missile launches would include the capability to attack ground-based cruise missile launch sites, and interdiction of cruise missile platforms—submarines, surface warships, aircraft, and even suspicious commercial ships such as container vessels. Active defense interception of cruise missiles will require optimal use of existing sensor and shooter assets, while building capabilities for electronic soft-kill capabilities. Passive defense measures can use methods similar to those used for BMD. Overall, it will be essential to obtain more comprehensive effects by systematically linking capabilities over the entire sequence from offensive defense to active defense and passive defense.