Briefing Memo

The purpose of this column is to respond to reader interests in security issues and at the same time to promote a greater understanding of NIDS.
A "briefing" provides background information, among others. We hope these columns will help everyone to better understand the complex of issues involved in security affairs. Please note that the views in this column do not represent the official opinion of NIDS.

Emerging Missile Defense Issues

Second Research Office, NIDS Research Department
TAKAHASHI Sugio

Introduction

About 10 years have elapsed since the government of Japan made the decision in the summer of 1998 to commence joint technology research with the United States into the Navy Theater-Wide Defense (NTWD) ballistic missile defense (BMD) system. While there have been efforts by international society to control ballistic missile proliferation during those years, such as the Missile Technology Control Regime (MTCR) or the Hague Code of Conduct against Ballistic Missile Proliferation (HCOC), these efforts cannot be said to have been completely successful. This was starkly demonstrated by the seven ballistic missile tests performed by North Korea in July 2007.

As a result, the importance of BMD as a physical countermeasure has become even more critical over this decade. In December 2003, the Japanese government made the decision to develop a BMD system, and a BMD unit consisting of Patriot PAC3 interceptors became operational in March 2007 at the Iruma Air Self-Defense Force Base. With this development, Japan has now acquired the capability of responding to a ballistic missile attack.

1. Current State of the US BMD Concept

The United States, of course, is the driving force of BMD. The US government sets "blocks" at two-year time-frames, proceeding with development and deployment in accordance with the targets announced in these blocks. The Block 04 targets set for the end of 2005 involved the equipping of a few Aegis cruisers with BMD capability, and the deployment of ground based interceptors (GBI) in Alaska in a test bed status (a test facility, but with battle-ready

capability), marking the operational start of the initial capability for the defense of the US homeland. In Block 06, which sets targets to be achieved by the end of 2007, these capabilities are being further strengthened. It should be noted that the BMD radar and interceptor bases planned for Europe that have so recently become a major point of contention with Russia are targets announced for Block 10.

The United States has been seriously engaged with BMD ever since the Reagan Administration's Strategic Defense Initiative (SDI). The current Bush Administration has been particularly active, virtually doubling BMD research and development funding (outlays for the Missile Defense Agency) from the Clinton Administration's final totals of 3.5 billion dollars in fiscal 2000 and 4.2 billion dollars in fiscal 2001 to 7.0 billion dollars in fiscal 2002, and reaching 9.4 billion dollars in fiscal 2007. Much of this increase has been directed toward a US homeland defense system for which development began in earnest following the abrogation of the ABM Treaty.

One particularly fervent backer of BMD development has been former US Secretary of Defense Donald Rumsfeld, who even before his entry into government served as chairman of a bipartisan committee on the ballistic missile threat, back in 1998. When Rumsfeld resigned from his post as Secretary of Defense in December 2006, there were many observers who expected that the BMD budget would shrink under the new secretary Robert Gates. This is why so much attention was paid to the Department of Defense budget proposal for fiscal 2008 presented to Congress in February 2007. And as a matter of fact, the BMD research and development budget came in at 8.8 billion dollars, a slight decline from the 9.4 billion dollars budgeted for the previous year. This marked the first such decline for the Bush Administration, and has sparked speculation on what the future trend may be.

The total BMD budget breaks down into three categories, including the terminal phase defense system (which declined from 1.09 billion dollars in the previous year to 960 million dollars), the mid-course phase defense system (which declined from 3.04 billion dollars to 2.52 billion dollars, excluding the Aegis BMD), and the boost phase defense system (which declined from 630 million dollars to 550 million dollars). Of the three, the funding cut was particularly large for the mid-course phase defense system, reportedly because the initial GDP deployment phase in Alaska is now almost complete. In fact, expenditure estimates for the mid-course defense system through FY 2013 show a gradual decline from the 2.36 billion dollars planned for fiscal 2009 to just 1.18 billion dollars in fiscal 2013 (it must be noted, of course, that US defense budget estimates should not be considered as binding on actual expenditures in the future).

Under these conditions, the systems that are expected to receive the greatest emphasis in the future are the Airborne Laser (ABL), the Ballistic Missile Defense System (BMDS) Interceptor, and the Multiple Kill Vehicle (MKV). The ABL system is a modified Boeing B-747 mounting a laser firing device for interception in the boost phase. On July 9, 2007, a low-output laser mounted for test purposes successfully illuminated a target aircraft. Although ABL is operationally restricted in many ways, such as limits on its firing range because laser beams tend to scatter in the atmosphere, and the need for absolute air supremacy because the aircraft is a lumbering B-747, the United States has nevertheless placed high expectations on this system because of its ability to target the boost phase, when ballistic missile interception is considered to be easiest. Expenditure estimates through fiscal 2013 show this system's budget declining to as low as 450 million dollars in fiscal 2010, but then rising back to 680 million dollars in fiscal 2011, and to 1.03 billion dollars in fiscal 2013.

The BMDS Interceptor is a next-generation ground-based interception system. The first-generation ground-based interception mid-course defense system, GBI, is deployed from fixed silos. The BMDS Interceptor, however, while also deployable from fixed mid-course interception bases, can also be deployed from mobile firing platforms, making it a system with enough flexibility for forward deployment and capable of interception in either the boost phase or the ascent phase (the stage after the boost phase when the booster fuel has expired but the missile is still rising). This system is scheduled to receive a gradual increase in budgetary funding from fiscal 2008, reaching an estimated expenditure of 570 million dollars in fiscal 2013.

MKV is a plan to develop the capability of mounting multiple interceptors on a single missile. Obviously, the interception success rate versus incoming ballistic missiles is directly proportional to the number of interceptors. While only one interceptor is mounted on each missile at the present time, if many interceptors could be mounted on one missile, then the interception rate probability would rise. In addition, one missile could conceivably be able to intercept multiple ballistic missiles, which would vastly boost the anti-ballistic missile capability. While this system's budget for fiscal 2008 is just 270 million dollars, it is expected to rise gradually thereafter, reaching an estimated 840 million dollars in fiscal 2013.

2. Japan's Missile Defense System

Japan's participation in ballistic missile defense began when the US government joined with Japanese corporations in a direct-contract relationship for the Western Pacific (WESTPAC) Missile Defense Architecture Study, which was launched in 1989 as part of the SDI program.

Later, Japan and the United States agreed in 1993 to form the Theater Missile Defense (TMD) working group between the US Department of Defense and the Japan Defense Agency, followed in 1998 by the start of joint Japan-US technology research into the NTWD system, and in 2003 by a Japan Security Council and Cabinet decision to introduce and deploy BMDs. This was followed in 2005 by another Security Council and Cabinet decision to engage in joint Japan-US development into an advanced-capability interceptor missile.

Japan's BMD development concept partitions "research," "development," and "deployment" into separate, individual stages. In other words, the commencement of research does not automatically mean that the process will then move directly to the development stage, and it is also entirely possible that the system that is eventually deployed will be completely different from the initial research and development phase. Moreover, Japan's BMD development program consists of two tracks, one for the introduction of already-feasible systems for deployment in response to current ballistic missile threats, and one for research and development with future ballistic missile threats in mind.

The first track is proceeding based on the above-mentioned Security Council and Cabinet decision made in 2003. This called for the deployment by 2012 of four Aegis cruisers, four Patriot PAC3 missile batteries, four new-type radars (FPS-5), seven modified existing radars (upgraded FPS-3), and a BMD system consisting of an automatic warning control system with the addition of an anti-ballistic missile capability. Of these systems, one missile battery has already been deployed at Iruma, becoming operational in March 2007.

The second track is the above-mentioned advanced-capability interceptor missile that was moved to the development stage in a decision by the Security Council and Cabinet in 2005. This is the SM-3 Block IIA Standard Missile, which was developed through the joint Japan-US technology research effort that commenced in 1999. Where the SM-3 Block IA had a diameter of 13.5 inches in the area above the second-stage rocket motor, the new version has a diameter of 21 inches, and is therefore called the "21-inch Interceptor Missile." While with the Block IA the deployment of two Aegis cruisers is required to defend Japan, with the Block IIA only one Aegis cruiser is sufficient to cover the whole land area of Japan. As a result, if the development of the Block IIA is successful, followed by a decision for deployment, it will then be possible to operate the BMD system more efficiently.

3. Future Issues

As can be seen, both Japan and the United States are definitively proceeding with BMD development in the face of an increasingly serious ballistic missile proliferation threat. Here, I

want to point out three issues that Japan will face in promoting future development.

The first thing that needs pointing out is the establishment of close cooperation between Japan and the United States. While Japan's ballistic missile defense system will be operated independently by Japan, it is a truism that information-sharing between the Japanese and US ballistic missile defense systems would boost interception efficiency against targeted missiles. In addition, in areas around Japan where Japanese and US ballistic missile interception systems have overlapping jurisdictions, failure to implement unified interception command and control could result in duplicate interceptions of a missile, or in failure to make any interception at all. To resolve such issues, Japan and the United States need to establish a suitable cooperative structure for interception command and control during emergencies. In the "U.S.-Japan Alliance: Transformation and Realignment for the Future" announced at the "2+2" Meeting of October 29, 2005, the two sides agreed that establishment of a Japan-US bilateral joint operations coordination center would mark a big step forward. Studies into the future shape of such a cooperative structure should be promoted by Japan and the United States in the course of joint Japan-US exercises and other activities.

The second issue is determining how BMD priorities should rank with other procurement items in the context of a limited defense budget. Since the price of a single Patriot PAC3 interceptor is roughly equivalent to one battle tank, BMD is an extremely expensive system.

Japan's total defense budget for fiscal 2006 was about 4.8139 trillion yen, of which personnel and provisions accounted for 44.3%, or 2.1337 trillion yen, and past liability expenditures accounted for 1.7542 trillion yen, so that general expenses available for use as policy expenses amounted to 926.0 billion yen. However, even these general expenditures available as policy expenses include quasi-fixed expenditures such as base expenses, which amount to about 400 billion yen, or 41% of the general expense total (this includes about 180 billion yen provided as "host" support for US bases in Japan). Within these limits, the total cost of the current BMD development plan amounts to about 800 billion yen, with an annual outlay of about 140 billion yen. While this amount is not, of course, intended to be spent in a single fiscal year, missile defense nevertheless occupies a huge proportion of procurement-related expenses in the current defense budget. And even though the ballistic missile threat is becoming more severe, the threats facing Japan are not limited to ballistic missiles alone. Since Japan's "procurement holiday" is going to end, procurement funding for the F-X (fighter aircraft), C-X (transport aircraft), and P-X (antisubmarine patrol craft) programs is also needed and resources cannot all be concentrated in BMD. Therefore, priorities must be firmly placed on defense capability development.

The third issue is setting basic strategic concepts for BMD. The BMD development program currently in progress should really be called an initial-stage deployment, and the main focus is on building minimum capabilities necessary for the defense of virtually all the land area of Japan. In other words, it should probably be considered a developmental program based on the basic defense framework concept in the National Defense Program Outline adopted in 1976, which aimed for the building of a "defense posture without gaps." Since Japan's BMD is based on the premise that US extended deterrence will function in general, and is designed as a complement to that US deterrence, this concept can probably be considered to be a natural development.

Meanwhile, with initial deployment scheduled for completion in 2012, there is a need for discussions on what strategic concept the progress toward deployment beyond the initial phase should be based on. One idea is to continue with the basic defense framework concept and proceed with capability improvements (such as updating from Standard Missile SM-3 Block IA to Block IIA). Another idea is to seek numerical superiority against regional ballistic missile threats.

I believe that it is unlikely that a large-scale ballistic missile attack will be directed at Japan as long as US extended deterrence is functioning, so there is probably no need at present to explore the latter idea. Surely the most effective expenditure policy is to set up a basic defense framework concept, build up a certain level of defense capability, and then boost the credibility of extended deterrence by strengthening inter-operability with the United States. On the other hand, however, we also need to prepare for future risks by engaging in research and development of higher performance, lower cost interception systems.

Conclusion

A famous figure of speech, "like shooting down a bullet with a bullet," is often used to express the technological difficulties of BMD. With the ballistic missile threat continuing to worsen, the United States has poured ever more investment into BMD to overcome these technological difficulties, and has at last achieved deployment of an interception system with a certain level of capability. Moreover, the United States can be expected to continue making these investments toward the development of even more effective interception systems.

Already, nearly 10 years has elapsed since Japan first began cooperating with the United States in BMD technology research. When that decision was first made, the debate in Japan over BMD centered on how Japan should cooperate with the United States, and on whether Japan should really be introducing BMD at all. Since then, joint Japan-US technology

research has progressed into joint development, and with actual operational status for the Patriot PAC3, that debate has become a thing of the past. But this does not mean that the debate over BMD has reached a conclusion. There is still much to debate regarding BMD at the present time, such as what deployment stance is most desirable for maximizing strategic stability in Northeast Asia, or how deployed BMD should be strategically utilized. The BMD policy debate needs to be developed in various avenues, such as considering how to build an armaments control regime that can be linked to improved transparency of China's medium-range ballistic missile forces.

Planning and Coordination Office, The National Institute for Defense Studies
Telephone: 03-3713-5912
Fax: 03-3713-6149
E-mail: nidsnews@nids.go.jp
Website: http://www.nids.go.jp