THEATRE MISSILE DEFENCE (TMD) IN THE ASIA-PACIFIC

CSS
STRATEGIC BRIEFING PAPERS
Volume 1: Part 4: December 1999.

States have traditionally relied on a policy of deterrence to counter the threat of ballistic missile attack by emphasising the likely retaliatory consequences for an adversary that uses ballistic missiles. The limited capability of many ballistic missiles systems has also made their military utility marginal and diminished their threat.

However, in the Asia-Pacific region, there has been a re-think of ballistic missile defence assumptions. The recently demonstrated ability of North Korea to over-fly Japan with a three-stage ballistic missile has caused Japan to question its invulnerability. The interest that China has shown in developing a more advanced missile capacity has caused Taiwan to question its previously assumed air superiority. Following the 1990-91 Gulf War the US has pursued a variety of programmes to provide protection for its forces deployed overseas from ballistic missile attack. This has been supplemented by US interest in a National Missile Defense (NMD) system, to protect the US from the threat of 'rogue' states with ballistic missiles, with similar technologies involved. TMD as a technological solution to ballistic missile proliferation is now receiving greater attention in the region.

In August 1998, North Korea flight tested its Taepodong-1 ballistic missile, a three-stage missile with a range estimated as being up to 1300 km. North Korea is currently developing a number 2 version that may have a range up to 6000 km, although testing has been delayed through diplomatic pressure. Depending on deployment of the Taepodong, North Korea the ability to target all of Japan, and in the future, perhaps even Alaska and Hawaii. Such a capability is a dramatic improvement over North Korea's previous missile capability, which was limited to short-range Scud systems, and also increases the potential threat to South Korea.

China is conducting a comprehensive upgrade of its missile capability, including plans to introduce multiple warheads to its ballistic missiles, and is investigating a variety of advanced surface-to-surface missile (SSM) technologies, including cruise missiles. China has purchased supersonic cruise missiles from Russia and is also looking at new guidance technologies including GPS and digital scene matching. Much of the motivation for these upgrades is the desire for a counter-air role to offset the capabilities of Taiwan's airforce, and to give greater options for precision strikes against a variety of targets. China has 150-200 M-9 and M-11 short-range missiles deployed opposite Taiwan.

Any TMD system deployed by either Japan or Taiwan is likely to be based around US systems that are currently in development. TMD systems use precision-guided interceptor missiles to target enemy warheads. US thinking on TMD envisages a two-tier system, with each tier requiring its own interceptors and defending against a different type of attack (see Figure 1). Currently, the Army and Navy are in competition over which system will be given priority. A decision is due in November 2000 as to which branch will be given the weight of research emphasis. The US believes that it will be able to deploy TMD in 2007.

The US Air Force is also testing a Chemical Oxygen-Iodine Laser (COIL) to be mounted on a 747 aircraft to shoot down ballistic missiles in their boost phase at a range of 200 km. The $1.4 billion project has been criticised for its practical and technical limitations but is being seriously considered for deployment in 2007.

Both Japan and Taiwan have the Patriot PAC-2 systems for lower-tier defence. The dilemma, therefore, might be whether to adopt the PAC-3 system when it becomes available, or to consider the Navy option based around the improved Aegis cruiser.

The US defence corporation Raytheon, who makes the Patriot system, and a selection of Taiwanese companies are investigating the feasibility of a Modified Air Defence System (MADS), based, more than likely, on the PAC-3 and other integrated systems. Taiwan is also considering the highly regarded Russian S-300 as an option, or a purely domestic creation. All projects are still at early stages, and the dilemma for Taiwan is whether to proceed independently of the US or in close co-operation.

Japan has allocated $8 million (US$) for co-operative research with the US in 1999, specifically for the Navy's NTW research programme, and may spend $250 million over the next 6 years. At this early stage, therefore, the Navy Aegis system seems to be at the forefront of consideration. Japan already has four Kongo-class Aegis cruisers so these could be the

platforms for further upgrades. Four new reconnaissance satellites are planned to be in orbit by 2002, improving Japan's ability to gather independent intelligence on its neighbours' capabilities. Like Taiwan, Japan still has reservations regarding the desirability of deploying TMD.

South Korea has concerns over its apparent vulnerability to North Korean ballistic missiles and also its agreement with the US not to develop its own ballistic missile capability. The 1979 RoK-US 'missile note' prohibits South Korea from developing missiles with ranges greater than 180 km. There is some pressure from the RoK to reconsider this restriction. South Korea currently has a limited anti-missile capability, with Patriot systems in the country under the control of the US Army, but there are plans to purchase US Aegis cruisers. South Korea is also interested in being involved in feasibility studies for a more robust regional TMD framework in co-operation with Japan and the US.

Improvements to lower-tier systems are essentially upgrades to existing capabilities in both Taiwan and Japan. There are important technological barriers that have yet to be overcome, particularly with the PAC-3 system where the interceptor directly targets the incoming warhead. Hit-To-Kill (HTK) is essential for upper-tier interceptions outside the atmosphere, but might also be useful for the 'clean' destruction of chemical and biological warheads inside the atmosphere. HTK requires precise targeting, whereas proximity detonation, used by PAC-2 and the US/Israel Arrow system, can be less exact. Still, if deployed, PAC-3 interception success rates are likely to remain low. Estimates put the kill rate of MADS against the Chinese M-11 missile at only 20%.

Figure 1: TMD Systems

	Lower-tier	Higher-tier
System: Army	PAC-3	THAAD
System: Navy	NAD	NTW
Coverage	Area 10s of km wide	Area 100s of km wide
Interception	Inside atmosphere	Outside atmosphere
Capability	Ballistic missiles up to 1000km range + cruise missiles	Ballistic missiles with +1000km ranges

PAC *(Patriot Advanced Capability);*
NZD *(Navy Area Defense);*
THAAD *(Theater High Altitude Area Defense);*
NTW *(Navy Theater-Wide)*

Higher-tier systems also face technological problems, best illustrated by the string of failed tests for the US Army's THAAD system. The urgency of the test programme was described in a US government report as a 'rush to failure'. However, should a higher-tier system prove technically feasible, it could form the basis of an anti-missile umbrella over all the potential targets in the North Pacific, if Taiwan, South Korea, Japan and the US all participate.

Both tiers of TMD encourage the states that they are directed against to consider offensive options. One country's defence looks threatening to another. It is very clear to China and North Korea that they are perceived as the threat requiring a TMD response. However, TMD also looks to them like potentially nullifying their deterrent that protects them from greater adventurism. Taiwan's decision to purchase the PAC-2 system in 1996 was highly controversial and a more robust TMD shield would likely provoke a strong response from China. China's missile upgrade programmes are fully focused on overcoming defensive measures. Countermeasures, high-speed boosters, depressed trajectories, manoeuvrable re-entry vehicles, and high-speed cruise missiles are all being considered. In 1996, China purchased from Russia two guided-missile Sovremenny - class destroyers, to be commissioned in late 2000 and 2002, expressly designed to counter the US Aegis vessels. This purchase reflects the shared concerns of both China and Russia over the implications of regional TMD developments. While North Korea lacks the ability to consider such a wide range of options, it will be forced to investigate what offensive upgrades might be necessary.

If technical difficulties can be overcome, TMD offers a technological solution to the problem of vulnerability to ballistic missiles. However, offensive upgrades might make an advantage in defensive measures difficult to sustain. An offence v defence arms race would be expensive and potentially destabilising. It would also complicate any diplomatic efforts that seek to resolve the underlying political conflicts that have led to TMD being considered in the first place. Decisions to invest in research and development are not decisions to deploy. Indeed, Japan may postpone a decision on deployment well into the future. The US is conscious of the security environment in the region and, while keen to ensure that there are a variety of options to counter the threat of ballistic missiles, is proceeding cautiously. Key deployment decisions may be years away, but military and political responses are already hardening.

ISSN 1175-1452