The Paths Ahead:

Missile Defense in Asia

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INTRODUCTION

In early 2005, Kurt M. Campbell, Director of CSIS' International Security Program, accompanied Secretary of Defense Donald Rumsfeld on a trip to Asia. Enroute, the Secretary and several of his close aides expressed an interest in learning more about the future of missile defenses in East Asia and the Subcontinent. Although familiar with the missile defense policies of countries in the region, they were concerned about how those policies were being implemented, whether the various national efforts were complementary or counterproductive, and how those efforts might affect the US approach to missile defense architecture.

These are questions well worth asking. Asia is home to two active exporters of offensive missile technology. At the same time, the technological capabilities of US allies and friends in the region have grown; all of the nations studied are capable of substantial contributions to their own defense. Yet diverse national interests, policies, and approaches have steered the nations of Asia in very different directions on the issue.

This study sought to assess developments in Asian nations' approach to missile defense, both to discover commonalities and differences that could shape a regional approach to the issues and to inform US thinking in shaping future missile defense architectures. The study focused on five countries that have made significant policy choices regarding ballistic missile defense (BMD), and currently face new ones. They are, in no particular order: Japan, South Korea, Taiwan, India, and Australia.

Early in the study team's interviews with officials of Asian governments, it became evident that there is no such thing as an "Asian missile defense position," and that the only meaningful way to understand the issue is country by country. This study therefore begins with a snapshot of today's situation in each country, considering threats to the country, its indigenous BMD capabilities, and its industrial ability to participate in developing its own defenses. The study moves on to examine the political and economic factors that shaped today's situation and will guide future developments, the major decisions facing each nation, and what US policies and capabilities may be required to provide a level of defense consonant with US alliance obligations and policy objectives.

In the span of just five countries, the study team discovered policies toward missile defense ranging from official antipathy to enthusiastic embrace, and from expecting the US to provide protection against missile attacks to declining to even consider such protection. While proliferating threats concerned all the nations studied, other motives for acquiring missile defenses ran the gamut from national pride to strategic leverage to potential employment as a tactical tool. These observations are detailed in the body of the report.

This report encompasses the work of CSIS experts and three working groups. Observing present-day conditions and projecting through 2025, the first group identified the ballistic missile threats to these nations and indigenous capabilities to address those threats. The second examined in detail each country's domestic politics and international policies as they gave incentive to or constrained defenses, the fiscal realities circumscribing national BMD efforts, and some policy implications for the US. Based on the observations of the first two groups, the third reviewed technical matters, particularly to identify gaps in existing planned defenses and draw implications of the Asian situation for the United States and its Ballistic Missile Defense System.

This study does not attempt to address the problem of defense against cruise missiles. While many of the assets relevant to BMD can also assist in cruise missile defense, the relative immaturity of the defensive technologies led the study team to focus on missile defense systems currently in development and the missions for which they are being deployed. A similar study of cruise missile defense policies and status would no doubt uncover many intriguing differences in approach and capability. Likewise, because the study focuses on defensive systems, it does not address Asian nations' capabilities to conduct attack operations as part of their BMD strategy.

This study operated under one significant restriction: the requirement to publish its findings openly. Parts of the study involve sensitive national policies, details of which could not be spelled out here (and some of which may indeed have been withheld from the study team.) Other judgments depend on a sophisticated technical knowledge of missile defense systems. Although key members of the study team and working groups are extremely familiar with the details of these systems, the team reached its observations and conclusions without reference to classified data of any kind. Due to the need to keep such observations general, specific data for some of the assertions herein – particularly those regarding the effectiveness of different systems in particular scenarios – are not shown. The study team hopes that the reader will

recognize that the judgments are based on sound technical data even if the supporting numbers cannot be cited in this paper.

Chapter 1
MISSILE DEFENSE IN ASIA: THE ENVIRONMENT

The economic miracle of Asia since the Second World War was made possible by the rapid adoption and mastery of new technologies. However, the same technology that expands economies also enables new types of military threat, and at the same time makes possible defenses against those threats.

Early embracers of new technology, like Japan and South Korea, prospered by adapting it to consumer needs and exporting the resulting products around the world. Later adopters, like China and North Korea, focused at first on military uses of technology, and especially on the ballistic missile. In response, other Asian nations have begun to explore how they can best defend against such threats.

North Korea and China currently pose very different threats to their Asian neighbors. North Korea has relatively small offensive missile capability, but has declared by word and deed its willingness to use such weapons. China's overwhelming regional superiority in numbers of offensive missiles poses a particularly difficult problem for defenders. Missile production is a pocket of Chinese excellence. Their offensive missiles currently cost less to proliferate than defensive systems, an advantage that can offer operational leverage. This is not true just for an Asian scenario; study participants pointed out that the United States would have difficulty defending itself against a Chinese missile attack under the current US missile defense plan, and asked how smaller countries with fewer resources could possibly expect to successfully mount such a defense.

It is a fair question, and not just one of operational planning. A moderation in economic growth coupled with rising inflation and (in some countries) political division have increased pressures to restrain defense budgets. At the same time, increasingly-sophisticated threats from air, land, and sea place greater demands on those budgets. Missile defense must thus compete for dollars in budget-constrained environments.

BMD requirements are also difficult to formulate. They are driven by the quantity and type of offensive weapons in threat countries and the strategies by which those threat weapons will be employed. Although the weapons inventory can be quantified, strategies are less observable. A prudent defender will thus prepare for a

wide range of threat technical capabilities. In the case of Asia, this translates to a need to plan defenses against a Chinese arsenal sized to counter other, larger forces elsewhere in the world – because they could conceivably be concentrated on the defender's nation. Defenses must also take into account facts of geography; while North Korea's force is numerically smaller, its threat comes from a different direction, and short flight times create unique requirements for some nations' defenses.

Proliferating missile capabilities also drive Asian nations' missile defense plans. However, when asked what other nations might emerge as ballistic missile threats in the next twenty years, working group members noted only Russia, a unified Korea, and perhaps sub-states of a fractured Indonesia. As none of these was considered very likely, analysis focused on present-day threats to each of the countries studied and how they might evolve, rather than inventing new threats.

Accurate analysis also requires distinguishing between political rhetoric and actual government policies in potential threat and defending nations. In several cases studied, domestic political rhetoric on BMD is at variance with the government's actual actions. While making this distinction poses a challenge on any subject, it is especially relevant with regard to so contentious a matter as missile defense, where governments, polities, and even militaries may be internally divided, leading to mixed rhetorical messages.

While it was necessary to address Asian missile defense policies country by country, some questions clearly cut across national lines:

- Can regional defenses be integrated in a way acceptable to US partners, and should they?
- Should Middle Eastern (e.g. Iranian) capabilities be included in Asian nations' planning?
- Does preparation for the Chinese and North Korean threats result in protection from all other threats?

These questions are addressed in the following pages.

Chapter 2
JAPAN

Japan – Today

Japan's commitment to missile defense is driven by a perception of imminent threat. On 31 August 1998, North Korea fired a Taepo Dong missile across the Japanese mainland, an unmistakable declaration of capability and perhaps of intent. Japan was already involved in missile defense development to a limited degree, but that event brought public attention to Japanese vulnerability. It resulted in focused and greatly accelerated Japanese efforts, and sharply increased public support for defenses.

That has led Japan to outstrip all other nations in cooperating with the United States to develop and deploy missile defenses. A comprehensive US-Japan security agreement announced in October 2005 greatly expended cooperation in missile defense, including a commitment to install a new X-band radar in Japan and liberal exchange of sensor data.[1] Japan intends to deploy SM-3 sea-based BMD missiles as soon as 2007, and is actively cooperating with the US to develop an advanced version. That development includes a commitment of $600 million in addition to Tokyo's existing BMD-related contracts to purchase Aegis systems for their *Kongo*-class guided missile destroyers, buy current-technology SM-3 missiles, and deploy PATRIOT PAC-3 land-based BMD systems. They have also expressed interest in purchasing land-based Terminal High Altitude Area Defense (THAAD) BMD systems.

Japan is also independently developing a new generation of radar, the FPS-XX, which will have significant BMD capabilities, and intends to upgrade a number of existing radars. The total commitment well exceeds $1.5 billion over the next five years, and may go as high as $3 billion for deployment and $8.9 billion to maintain and operate.[2] These programs are particularly significant demonstrations of national priorities, given a limited defense research and development budget.

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[1] "X-band" frequencies are most useful for characterizing the incoming weapon and discriminating actual warheads from decoys. Current Japanese systems do not operate in that band.

[2] "Cost Of Joint Missile Defense System Triples: Report", *Defense News*, September 27, 2005.

Although North Korea's capabilities are publicly presented as the primary threat and appear to drive the Japanese BMD concept of operations and force sizing, the Japanese defense program is officially capability-based, not driven by any particular threat. Working group members observed that Japan is selecting defensive systems based on the most stressing threat, China, particularly in the case of the SM-3 Block II.[3] A Japan Defense Agency white paper confirms that both China and North Korea are considered potential threats.[4] While Japan's planned defenses will not be adequate to defend against a full-scale Chinese attack, Japanese officials cite the value of BMD in buying time to allow critical Japanese assets to survive until the United States responds more comprehensively to an attack.

Much of Japan's BMD will be developed domestically, as Japanese industry has demonstrated the technical capability to build advanced electronics and missile systems. In addition to co-developing the SM-3 Block II, Japanese firms will build PAC-3s under license. Japan also has the strongest indigenous missile design technology base of any country studied, and is technically capable of developing its own defenses should an independent course from the US prove politically preferable. Their indigenous FPS-XX radar will considerably enhance existing launch detection, cuing, and tracking capabilities.

Japan – Politics

Until the 1998 Taepo Dong launch, Japan maintained a cautious approach to missile defense. That act galvanized Japanese public and official attitudes toward BMD, and is credited with renewing the country's attention to national defense and making national politics generally more conservative. While initial debate on BMD was vigorous, observers cite opposition to BMD as a major factor in the decline of the political left, and the debate is today considerably more muted.

That shows in the Diet's approval of significant legal changes to ease BMD development. In December 2004, they eased Japan's longtime ban on arms exports to

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[3] Some on the study team posited that the Japanese government assigned the relative priority of North Korean and Chinese threats for both domestic and external political purposes, but that their basing weapons selection criteria on the Chinese threat shows where Japan's true concern lies.

[4] "Japan to Speed Up Missile Defence", *The Australian*, August 3, 2005.

facilitate BMD development and open the possibility of third-country sales.[5] In June 2005, the lower house of the Diet revised Japan's Self-Defense Law in numerous ways, including granting the Minister of Defense release authority for BMD weapons in order to shorten response times. The upper house passed the bill a month later.[6] Although the acceleration of Japan's BMD programs came under the Koizumi government elected in 2001, observers believe that a change of party control would not fundamentally change Japan's approach to BMD.

Externally, Japan hopes that cooperation in BMD will reinforce its security ties with the US across the board. The Japanese government remains confident of the US commitment to its extended nuclear deterrent. Officials nonetheless express doubt that China believes the US will put its cities at risk to deter attack on Japan, and thus are uncertain whether that US extended deterrence will be effective. This is a significant motive behind Japan's increase in self-defense capabilities.

At the same time, that uncertainty poses a challenge for US diplomacy. Japan has the technical capability and resources to create an offensive nuclear deterrent. Although Japanese history and current policy argue against such a development, deterrence could be seen as a more efficient way to avert the effects of an attack on Japan in light of the number of Chinese offensive systems compared to Japan's defenses and the cost tradeoffs between creating a deterrent force and comprehensive defense. A US government opposed to proliferation of offensive systems will have a significant interest in continuing to assist Japan to deploy sufficient defenses to forestall any move to an offensive option.

At this point, the Japanese government sees defenses as more "moral" than creating offensive deterrent forces, and considers spending on self-defense comparatively easy to justify to the public. While government officials acknowledge that their BMD policy leads public opinion at this point, observers note that public opinion on BMD divides along generational, not partisan, lines. Japanese born after the Second World War and its immediate aftermath tend to support missile defense substantially more strongly than do those 55 and older.

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[5] As previously constituted, the arms export ban would have prevented Japanese missile subassemblies from being shipped to the United States for integration. As of this writing, though, the export control revisions were still in internal government coordination and had not taken effect.

[6] Under the bill, the Defense Agency chief would be authorized to issue an intercept order only after securing the prime minister's consent, unless there was no time to seek such consent.

Japan – Technical Issues

Geography places the North Korean threat close to Japanese territory, meaning that timelines for launch detection and response are quite short, with typical missile flight times on the order of ten minutes. Because much of that distance includes the Sea of Japan, though, oceangoing sensor platforms such as Aegis can be positioned well forward, for maximum cuing time, and sea-launched defenses benefit from excellent engagement geometry.

Japan also benefits from the existing US BMD capability defending South Korea. Sensors and BMD assets in place there can help warn of (and may to a lesser extent attrit) attacks on Japan. Significantly, planned US systems are being designed with the North Korean threat fully in mind. As boost-phase systems, the Airborne Laser (ABL) and Kinetic Energy Interceptor (KEI) should be able to address missiles leaving North Korean sites for Japan, although effectiveness will vary according to basing mode and concepts of operation.

The most significant technical gap in Japanese defenses is a lack of capability against Chinese ICBM-class weapons. Also, the threat to Japan from weapons of mass destruction (WMD) suggests that early intercepts – in the low exoatmospheric or high endoatmospheric range – would be preferable to reduce the effects from a high burst warhead, and to allow a possible second defensive shot at lower altitudes. The US THAAD system is designed to have some inherent capability against this threat, and its high-altitude intercept capability and integral X-band radar would be advantageous to defending Japan.[7]

Japan – Choices

Japan's commitment to defending itself against ballistic missiles is undeniable. But it faces major decisions on how to integrate the elements of its own defense system and whether and how to make its systems interoperable with the US and regional allies.

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[7] The Aegis system's radar operates in the S band, and is useful for launch detection and tracking. X-band radars are better able to discriminate targets. A combination of the two is optimal.

Internally, Japan is currently working through the challenges of crafting an effective BMD command and control, battle management, and communications system in the face of a complex BMD architecture, stovepiped interaction between the military services responsible for procuring and operating those systems, very short response timelines, and traditions of centralized political control over operations.

Externally, the structure of command and control over US and Japanese systems is unclear. With both nations having sensors and shooter platforms cooperatively defending the same targets, some means are needed to coordinate and deconflict operations. Japan is in the process of building a comprehensive BMD command and control/ battle management system, which will enhance overall defense performance and provide for interoperability, but does not yet have a way to coordinate battle management with the US.

Although Japanese hardware will be compatible with existing US systems, current Japanese law requires that sensor data be exchanged only when doing so enhances protection for Japan. Under this regime, data from a Japanese sensor detecting a North Korean missile launch toward the United States could not be shared with the US, since Japan was not the target. While the government argues that there is no legal problem in providing information on launches to US forces, they do agree that the specific data required to perform intercepts – potentially the most useful information – would be restricted by Japanese proscriptions against "collective security".[8] In the October 2005 agreement, the Japanese government agreed in principle to give the US access to data from their FPS-XX radars, although it is not yet clear whether this includes the intercept-quality data. They also agreed to installation of an X-band radar station in Japan.[9]

A related choice is to what extent the system should be designed primarily around Japanese needs. Japan's proximity to North Korea makes it a valuable asset for assisting in defense of the United States, Australia, and other countries. However, the types of radars, communications equipment, and command structures most useful for passing data to other nations are not consonant with those optimized for Japanese self-defense.

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[8] "US Wants Japan to Share Missile Defense Radar Data," *Yomiuri Shimbun*, July 20, 2005.

[9] The BMDS is the all-encompassing term for US missile defenses. This report also uses the word "system" to refer to individual programs like PAC-3.

Regional interoperability is also an issue for Japan. As the leading developer of BMD capability in Asia, Japan is seen by other countries as a desirable partner in their own BMD efforts. Taiwan has evinced particular interest in securing Japanese cooperation to help develop defenses, an approach which the Japanese have firmly rebuffed. Observers note that this refusal is due not to antipathy toward Taiwan or the concept of cooperation, but concern about the political consequences should China see Japan aiding Taiwanese military capabilities, particularly if it entails interoperability between the two states or other evidence of alliance. Nonetheless, sensors in Taiwan and South Korea could be very useful in cuing Japanese defenses against launches aimed at its territory.

Interoperability issues among Japan's military services remain unresolved, but the 2005 revisions to the Self-Defense Law established a unified operational command structure for the Japanese military. Interoperability may also increase as the services come to understand the capabilities of their new systems. However, each military service still has a separate procurement process. With sensor and shooter platforms distributed among the services, especial care must be taken to coordinate the types of hardware bought, the pace of individual services' programs, and ensure interoperable C^3. As the unified command structure will not come into effect until April 2006, operational relationships among the services have yet to be proven.[10]

Japan's most significant diplomatic challenge relative to BMD comes in managing its relationship with threat nations. Beijing has made plain its displeasure with the notion of Japanese missile defenses, charging that defenses are part of a strategy to enable Japanese offensive operations in the region. Both China and South Korea are wary of what they see as a rising Japan. While Japan's response to this charge has included reiteration of the constitutional restraints on Japan's military and the country's commitment to remain free of nuclear weapons and offensive missiles, the characterization of BMD deployment will have to be carefully nuanced to avoid encouraging offensive proliferation by its current or future adversaries.

Another diplomatic quandary is how to approach potential participation in any US space-based BMD system. Japan's technology industry is capable of significant

[10] Japanese military officials note that the need for a coherent BMD response is the driving force behind their creation of a joint military staff.

contributions to such a system, but strong opposition to space defenses from potential adversaries will make Japan's endorsement of or participation in such a system a diplomatically delicate matter.

In the end, the most significant question facing Japan is whether to develop an offensive deterrent capability. As a space power, Japan already has a sufficient grasp of launch technology to develop ballistic missiles. They also have far more civilian nuclear design expertise than some other countries that have sought to assemble nuclear weapons. An independent Japanese nuclear deterrent would eliminate concern about whether an adversary believes in the US guarantee of extended deterrence. Japan's history as the world's only target of nuclear weapons continues to exert a restraining force, but given new threats, the political trends among a new generation of Japanese, and the cost-effectiveness of offensive deterrence, Japan may find development of a strategic deterrent increasingly thinkable.

Chapter 3
SOUTH KOREA

South Korea – Today

Despite its location next to one of the world's leading proliferators of missile technology (and a regime not shy about demonstrating its capabilities), missile defense is little discussed or debated in South Korea. That is not happenstance, but policy. The South Korean government sees overt participation in missile defenses as antithetical to its national interests, for reasons described in the next section.

To the extent that government officials admit to considering missile defenses, North Korean capabilities are the only planning factor. Individuals familiar with South Korean plans say that China and perhaps Japan may also be considered, but only in the context of avoiding taking actions now that could adversely affect the strategic situation after Korean reunification. This case is widely accepted; observers of the South Korean government do not believe the government gives one line about threat to the public while actively planning for another.

The moves South Korea has made to enhance defensive capability stop short of full BMD. They have begun production of Aegis-capable KDX-III-class destroyers that can detect and track missile launches, although they will not carry anti-missile weapons. And South Korean and German officials met in mid-2005 to discuss the possible purchase of former German PAC-2 missiles for air defense purposes. The PAC-2 has additional, if limited, utility for BMD.[11]

South Korea – Politics

The South Korean government sees deploying its own BMD as a threat to its external relations. Reconciliation with North Korea and reduction of tensions on the peninsula are its policy priorities at this writing, with good relations with China increasingly important due to growing economic ties and positioning for post-unification Korea. Seoul believes that acquisition of or participation in development of BMD would jeopardize both relationships.

[11] German politics have delayed consideration of the sale into 2006.

It is so important to the government that South Korea not be seen as seeking a BMD capability that they refuse to consider co-development of BMD systems despite having both an extensive defense industry and a sufficient high-technology industrial base to participate in co-development and/or co-production of all but the most sophisticated hardware.

South Korea does not want to risk undermining its engagement policy with North Korea even by accusing Pyongyang of hostile intentions. Seoul also believes that the actual threat of conflict is lower today than 10 years ago due to the political rapprochement and ongoing discussions between the two countries, even though the North has continued to develop offensive weapons and fulminate against South Korean policies.

At the same time, the South Korean government is not sanguine about the missile threat posed by the North. They are therefore willing to accept protection by the PAC-3 systems the US already has in country, provided it is clear that South Korea possesses neither its own BMD capabilities nor any operational control over the US systems, and is not participating in co-development. Seoul's enthusiasm for BMD is also tempered by the belief that the principal military threats to South Korea come from the North's artillery and short-range missile systems, not the longer-range systems against which current missile defenses are designed.

There is very little domestic debate on BMD, as the governing parties agree on the current approach. The Korean public shows some generational divide on BMD, although it is in a sense reversed from the Japanese case. In Korea as in Japan, younger citizens are more willing to accept indigenous BMD capability. The core issue is not missile defense itself, but who provides it. The political ascendancy of the "386 generation" (those in their 30s, who went to college in the 1980s, and were born in the 1960s) has led to a leftward shift in South Korean society and political viewpoint. The public increasingly sees US policies as a greater threat to peace and stability on the Korean Peninsula than North Korea's military capabilities. They are thus less willing to accept US protection than South Korea's current leaders.

South Korea – Technical Issues

As with so many issues between the Koreas, the overriding factor in designing a missile defense for South Korea is geography. Thanks to North Korea's proximity and the concentration of high-value targets in the Seoul area close to the border, any defensive system would have to respond in a very short time. This puts a premium on sensor systems able to detect a North Korean launch as early as possible, and short decision chains that allow prompt action. Uncertainty of launch detection would also seem to enhance the value of terminal defense systems, as they require less lead time for action than boost- or midcourse-phase systems.

The ABL and KEI systems are designed to cope with North Korean threats, but the short launch-to-impact timelines and relatively low flight trajectories of a North Korea to South Korea launch will challenge sea-based KEI's ability to reach its targets in a timely fashion. The technical working group recommended that boost-phase KEI not be considered for this specific scenario, although sea- or land-based KEI could be effective against North Korean missiles launched at more distant targets with greater times of flight. The Navy's Aegis system adds an overland air surveillance capability and an ability to cue other shooters, although seaborne basing of the SM-3 missile would result in very difficult intercept geometries and timelines for the inter-Korea launches. SM-3 has useful ascent-phase capability for launches to more distant targets.

The existing US PAC-3 systems and potential THAAD and ABL systems are very useful in this scenario. Land-based KEI could make a contribution should its planned terminal-phase capability be deployed.[12]

South Korea – Choices

Seoul's focus on its post-reunification status and strategic orientation does not only affect its policy toward China. It is entirely possible that a unified Korea may want to establish a more neutral position with regard to its neighbors, distancing itself from the US and requesting the withdrawal of US forces. As the US provides Korea's entire missile defense, this would leave Korea with no BMD capability without reducing

[12] As KEI is very early in its development, its capabilities are not yet known. Some aspects, such as the ability to engage in the terminal phase, are not planned to be available until well into the twenty-year timeframe of this study.

China's offensive capability. Even after any reunification, Korea will have to walk a BMD policy tightrope between its reluctance to aggravate a powerful neighbor and preventing that neighbor from employing its massive power to influence Korean behavior and constrain its freedom of action.

Although today's South Korea is willing to accept the protection offered by existing US capabilities, the question of whether to accept additional US BMD assets in country is considerably more sensitive, even if they remained solely under American control.[13] This political sensitivity suggests that the US focus expansion of BMD capabilities on offshore assets, where sovereignty is less an obvious issue. Unfortunately, the technical analysis suggests that this would not be the most effective route.

Although South Korea currently perceives BMD in solely a North Korean context, circumstances could arise in the longer term that could increase Seoul's receptivity to deploying BMD. The most likely drivers would be if Seoul's relationship with Beijing or Tokyo deteriorated; if a new South Korean leadership took a different view of North Korean intentions; or if North Korea demonstrated unambiguously that it had developed the capability to launch a nuclear weapon via missile. South Korea's current goal is to render the North Korean threat moot through reunification. The subsequent BMD approach of a reunified Korea is beyond the scope of this study to posit.

[13] Cost sharing is also an issue.

Chapter 4
TAIWAN

Taiwan – Today

Taiwan is in a singularly unenviable position when it comes to missile defense. Their principal adversary – indeed, the only one that figures in their planning – owns one of the largest missile arsenals in the world, including both ballistic and cruise systems. Many of those missiles are based little more than a hundred miles away, offering nearly no time to respond to an incoming strike. And a number of complicating factors limit allied capabilities to bolster that defense.

All of this would be a challenge for a country with established defenses and a strong national program and budget to develop them further. But Taiwan is starting essentially from scratch, and fractious internal politics mean there is no national consensus for such defenses or even the severity of the threat, so BMD must be funded through extraordinary means if at all.

Taiwan's defensive goals are modest; the government is under no illusion about the ability of even ideal missile defenses to absorb a full-scale Chinese attack in which incoming weapons would outnumber interceptor missiles by six or seven to one. Neither do they expect to defend point targets successfully, even with US assistance. Interviews with government officials indicate that Taipei's goals in acquiring BMD are to avoid diplomatic coercion and raise uncertainty in an opponent's mind about the success of a quick, perhaps limited decapitation strike.

Even those modest goals seem quite remote today, as Taiwan's current defensive capabilities are extremely limited. They have agreed to purchase a PAVE PAWS-based advanced land-based radar system from the US, but it is not clear how they propose to fuse its sensor data with the proposed PAC-3s. They have deployed some PATRIOT PAC-2 GEM missiles, which offer some defense against short- and intermediate-range missiles,[14] but do not provide the hit-to-kill capability of the PAC-3s, considered advantageous against WMD warheads.

[14] The GEM (Guidance Enhanced Missile) upgrade gives the PAC-2 more anti-missile capability than the ordinary PAC-2s referred to in regard to South Korea.

Some of that supply shortage could be addressed indigenously; as proven on the Ching Kuo and Golden Eagle fighter programs, Taiwanese industry is quite sophisticated in electronics and assembly of complex systems. They are certainly able to co-develop and co-produce defensive weapons, but have less experience in missile design – particularly energetics – and system integration. Still, the Taiwanese technology industrial base is skilled and flexible, and much of it could be adapted to defense production.

Taiwan – Politics

Although few policies enjoy a consensus in Taiwan's current political environment, BMD is an unusually polarizing issue. The opposition Kuomintang and People First parties see BMD as a provocation to mainland China and an obstacle to peace and stability across the Taiwan Strait.

In 2005, the Legislative Yuan defeated both the main and special budgets that included both initial funds to acquire PAC-3s and the advanced radar. While the executive continues to consider all funding options, the opposition remains resolute against supporting procurement.

BMD has been a very public issue in Taiwan. The country held a government-sponsored public referendum in 2004 on whether to proceed with acquisition of missile defenses. Although an overwhelming majority of those who voted favored BMD development, the referendum failed to draw the 50% of voters required for it to take effect. The opposition has used this result to defend its resistance to BMD.[15]

The policy divide extends to Taiwan's military. Diplomats and observers note that the Taiwanese Army opposes BMD, while the Navy favors it and the Air Force is split. The service positions on BMD do not necessarily stem from appraisals of merit but from internecine budgetary and power rivalries, as under the Taiwanese system, the Army would be required to pay for the BMD systems, while the Air Force and Navy would operate them. (The Taiwanese Navy supports BMD in large part because they

[15] The failure to achieve a quorum was, in fact, the principal goal of opponents, who urged a boycott of the referendum rather than voting "no."

perceive a US offer of Aegis-equipped destroyers to depend on government commitment to the PAC-3.)

By any measure, the political atmosphere around BMD in Taiwan is chaotic, and a change in executive or parliamentary leadership could mean a significant change in missile defense policy.

Taiwan – Technical Issues

The overriding consideration when fashioning a missile defense of Taiwan is the short response timelines. Even with the advanced US radar, defenses will have at best a few minutes to respond. The reduction in response times capability offered by space-based staring sensors can offer a meaningful advantage to defenders.

The task of defense may be eased because the country itself is a prize for the likely adversary. The greatest threat to Taiwan comes from conventional weapons, chosen to minimize the damage to valuable infrastructure and industrial base in the event of an invasion. Terminal defense systems therefore have higher value than when nuclear weapons are the main threat, as the range of effects of a conventional warhead will yield little damage on the ground from even a low-altitude intercept, and salvage fusing by the offense has no practical effect.[16]

China's daunting air defense environment and its increasing capabilities to deny freedom of the seas pose significant technical challenges in any scenario involving Chinese missile threats. These hold particular implications for ABL and sea-launched defensive missiles.

The latest generation surface-to-air missiles have effective ranges of hundreds of kilometers, which will challenge planners trying to bring ABL into the fight. The fleet of ABLs will be limited, with only one aircraft in the current Future Years Defense Program and no more than seven planned by 2025. Therefore, they are expected to operate in a mode similar to today's AWACS and JSTARS, similarly high-value aircraft with small fleets. The ABL concept of operations envisions a substantial escort force

[16] "Salvage fusing" is a tactic posited for nuclear weapons, whereby they are rigged to detonate in the event of intercept. This requires intercepts to take place at very high altitudes in order to minimize the effects of that blast on the ground.

that will respond to threats to the aircraft, including suppressing threatening fires. With a rapidly retargetable energy weapon on board, the ABL will have unusually robust self-defense capability. However, Chinese fire against an ABL defending Taiwan would be an act of general war between China and the US, as would US suppression of Chinese air-defense assets on the mainland. The ABL therefore has value as a tangible evidence of US commitment and deterrent tripwire in this scenario that may make it useful beyond its defensive capabilities. At the same time, concepts of operation must account for the consequences of suppressing fires.

Similar calculations apply at sea. China is deploying a suite of area denial technologies, including anti-ship cruise missile systems, submarines, and fast-attack boats, creating the capability to push US ships out of even marginally-effective missile defense range. Even if US Aegis ships find a way to survive in an increasingly hostile anti-access environment, they face a real challenge to effectively defending Taiwan. Assuming China would use some of its short or medium-range missiles as anti-ship defenses (a tactic they have practiced), the US Aegis platforms would have to allocate a finite load of weapons between defending Taiwan and ship self-defense. Further, the short flight time and low profile of most Chinese missiles arrayed opposite Taiwan challenge the limits of the SM-3 and proposed KEI seaborne weapons unless the defending ship were in the Taiwan Strait proper, interposed between the combatants. Even were US Aegis ships pushed beyond missile range, though, their radars still have sufficient range to provide coverage of the area.

That leaves the brunt of Taiwan's missile defense to PAC-3, THAAD (if available), and any new US system, perhaps aided by Aegis radars. And those defensive systems cannot assume that the entire attack will come from the territorial Chinese mainland; like Japan and Australia, Taiwan may need to defend against unconventional tactics (the "SCUD on a barge" threat) that present very short-range targets from unexpected azimuths. China also possesses submarine-launched ballistic missiles that could be fired with depressed trajectories from anywhere around the island, reducing the opportunity for detection and making intercepts extremely challenging.

Land-based systems avoid the anti-access challenges posed by Chinese military forces, and do not require strategic warning to move into tactical position. PAC-3 is available today, and THAAD should be available well inside the time frame of this

report. THAAD would add significant capability against both off-azimuth and depressed trajectory tactics as well as against longer-range systems.

However, given the dimensions of the challenge to defenses, the working group agreed that the effects of a missile attack against Taiwan would also have to be addressed by other means such as prevention, discussed in the next section.

Taiwan – Choices

With political polarization and debates over the costs and benefits of BMD for Taiwan, it is difficult to see how the island will be able to proceed with missile defenses in the near future. The relevant sub-question is whether it is worthwhile for Taiwan to pursue BMD in the face of both Chinese political pressure and the PRC's ability to multiply the threat almost at will. Given the cost tradeoff and a booming economy, China could easily continue to deploy six or seven offensive missiles for every Taiwanese defensive missile to overwhelm the island's defenses. The alternatives may be little more palatable. Relying completely on the United States to provide for its defense undercuts Taiwan's claim to be a fully sovereign nation, and is a course the US is ever less likely to accept.[17] However, each of these decisions should be taken independently. If BMD can only be marginally effective for Taiwan, the question of whether it is worth the financial and political cost does not depend on what will replace it.

Given the difficulty of a successful active defense (by almost any definition) against a missile attack from China, attention naturally falls to possible ways to prevent an attack. The question of whether to develop offensive capabilities is already under debate in Taiwan.[18] Among others, former president Lee Teng-hui recently argued for exactly that, arguing that the impossibility of successfully defending against a Chinese missile attack required a different approach. However, given China's avowed

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[17] "A senior Pentagon official yesterday sharply criticized Taiwan's government for not moving ahead with an arms buildup to counter a mounting threat from China. Edward Ross, a senior Pentagon security cooperation official, also suggested in a speech that the United States might not defend Taiwan in a conflict with China unless Taipei does more to boost its defenses and national will. 'As the lone superpower, our interests are plentiful and our attention short,' Mr. Ross said. 'We cannot help defend you if you cannot defend yourself.'" "Taiwan Slammed On Lax Defense", *The Washington Times*, September 20, 2005.

[18] "Ex-President Says Taiwan Needs Missiles", *The Washington Post*, October 19, 2005.

sensitivity on the prospect of missile defenses proliferating through Asia, it is difficult to see that offensive proliferation – particularly in neighboring Taiwan – would not be considered a pretext for conflict.

Should Taiwan decide to continue with BMD, they would face the question of how to get assistance in development. Taipei very much wants Japanese cooperation, but neither Japan nor any other regional partner is interested in overt collaboration. While it may be possible for an intermediary to broker some covert assistance, a regional approach might be a more promising path. Were the East Asian nations interested in BMD to join in a consortium of mutual assistance and coordination, all could benefit, duplicative or counterproductive efforts could be reduced, and Chinese displeasure would be diffused. However, while Taiwan could certainly join in the work of such a consortium, it is probably not in the best diplomatic position to initiate the idea.

An unresolved issue is whether Taiwan takes the same view of the US extended deterrent as Japan. Does Taiwan believe that Beijing regards the US nuclear guarantee as valid? While strategic ambiguity on the point may be useful for the US, it adds pressure to the debate in Taipei.

Taiwan also has to consider the degree to which its system requirements and spending are actually driven by national needs. The advanced PAVE PAWS-variant radar currently under discussion is far more useful to broader US BMD efforts than to Taiwan proper; the marginal improvement in warning time it provides appears not to significantly enhance Taiwan's ability to defend itself. They must also consider the political and technical challenges posed by integrating Taiwanese sensors into the US Ballistic Missile Defense System (BMDS),[19] and US sensors into whatever system Taiwan ultimately deploys.

The United States also faces choices in this case. Perhaps the most significant is the degree to which Washington is willing to take pre-emptive action to guarantee Taiwanese security. While US BMD assets may not be able to significantly alter the outcome of a Chinese missile attack on Taiwan, attrition of missiles prior to launch through offensive air operations or other conventional means – or the threat of these

[19] The BMDS is the all-encompassing term for US missile defenses. This report also uses the word "system" to refer to individual programs like PAC-3.

measures – could make a significant difference in attriting such an attack. A US declaration of policy on this score may make Taiwan's decisions easier, at the cost of greater tension between the US and the PRC, especially if Beijing's avowed response to such a campaign would be nuclear.

While Taiwan's situation leads to many choices, the mismatch in forces across the Strait makes all of them difficult.

Chapter 5
INDIA

India – Today

India's geography gives missile defense planners a particularly interesting set of issues. On one border lies Pakistan, a known foe that is developing ballistic missile capabilities. On another is China, the leading missile power in Asia. While these may seem equal concerns, Indian officials in public and private are clear that Pakistani capabilities are the principal planning factor for Indian BMD.

This focus may also have been made clear to Beijing. Observers note that China, which has made colorful official pronouncements opposing many other nations' moves toward developing missile defenses in the region, has remained curiously silent as India has moved forward.

As India's interest in missile defenses has increased over the past few years, the United States has responded with mixed signals. India initially approached the US in 2003 about possibly procuring PATRIOT PAC-3s, but US sensitivity toward relations with Pakistan led the administration to suggest that India might find Israel's Arrow system to its liking. Upon learning of Israel's proposed sale, though, senior members of some Congressional defense committees were publicly upset that Israel would attempt to compete with US-made systems by exporting Arrow, which was developed largely at American taxpayer expense. This displeasure was communicated to DoD in person and through legislative language.[20]

Finally, in June 2005, India and the US concluded a comprehensive defense cooperation accord that made PAC-3s available. India also continues to consider the Arrow system and, by some reports, variants of the Russian S-300. Indian officials affirm that despite the lengthy evaluation process, they are not just browsing; they are quite willing to buy a system once it's clear the technology works.

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[20] The House Armed Services Committee report on the fiscal 2004 defense authorization bill included a statement of concern about the proposed sale, and urged the administration to develop policies to limit such offers in the future.

Missile development in the Middle East may pose a unique challenge to India, due both to geography and historical tensions between primarily-Hindu India and its Moslem neighbors. India has made clear, though, that Iranian missile capability is not a planning factor for Indian BMD. Their view of Iran is more benign than the United States', and India may also seek to remain friendly with Iran as a political counterbalance to Pakistan in the Islamic world.

The Indo-Pakistani arms race is a matter of no small concern to the US. Both India and Pakistan possess nuclear weapons and missile delivery systems, but Pakistan is not known to actively seek BMD; indeed, in the wake of India's consideration of PAC-3, some Pakistani officials disdained BMD and belittled its effectiveness. Pakistan's counter to India's missile defense moves instead appears to be development of cruise missiles. This will be further addressed in the technical issues section below.

The Indian government is also concerned about a "wild-card" rogue missile threat, perhaps from a failed Pakistan, or non-state actors with access to Pakistani weapons (a missile analogue to the A.Q. Khan nuclear network.)

Although they have done little work with US firms to date, India's aerospace industry has demonstrated tremendous competence in building and indigenously improving other countries' systems. It is already capable of co-production and some co-development of electronics and aerostructures. They are familiar with advanced materials and can draw upon a large base of trained software coders.

India – Politics

External political issues play a fundamental part in India's approach to BMD. Officials have indicated that their interest in missile defense does not stem only from proliferation of offensive systems in the region, but also for its political use to underscore India's status as a major nation. They assert that missile defense capability is the mark of a great power and a demonstration of national technical capability. It is also seen as a means of gaining political leverage with neighbors without presenting them with a new threat. And one reason for insistence that an Indian BMD capability be independent is a conscious political effort to not appear overly close to the US.

That is emphasized in their rejecting the idea of US operating defenses on India's behalf. While India is interested in purchasing US systems, official policy maintains

that any national defenses must be under Indian control. This complicates cooperation in operating BMD, as it is neither technically easy nor necessarily operationally desirable for Indian personnel to be in the loop on US-operated systems (as opposed to PAC-3 and conceivably THAAD that could be sold outright.) However, the acceptable command arrangements for such systems are a matter for US policymakers to decide.

Although the ruling Congress party opposed BMD during the last campaign, they have generally maintained the predecessor Bharatiya Janata Party's BMD initiatives since taking power. That fact – and most discussion of missile defense – is kept low-key by the government. Indeed, the Indian pursuit of BMD capabilities receives much more coverage in the US media than in India's. While the government sees defenses as more in keeping with Indian traditions than the use of offensive deterrence, they continue to pursue both tracks.

India – Technical Issues

The working group considered SRBM and MRBM threats from Pakistan and an IRBM/ICBM threat from China as the most likely BMD challenges for India. Both countries also possess cruise missile technology, which is beyond the scope of this study, but poses a significant and growing challenge. Pakistan has advertised its development of cruise missiles as a counter to Indian BMD efforts; although their claim of indigenous design has been questioned,[21] the threat remains relevant, and only a very ambitious deployment of sensors to augment the PAC-3s or Arrows will make even a rudimentary cruise missile defense possible.

Geography poses a significant problem in any attempt to extend US protection to India, as so much of the country, including its major population centers, is located well inland. This makes SM-3 effectiveness very dependent on the specific launch site and target chosen, although as with Taiwan, the Aegis sensors may be useful in assisting other systems for targets beyond SM-3 range. Boost-phase KEI, which depends on some proximity to launch sites, faces a similar difficulty if seaborne. ABL was judged potentially useful against Pakistani launches.

[21] "Pak Missile is Made in China", *Times of India*, August 12, 2005.

If US-owned BMD assets are to be employed in India's defense, India's desire for operational involvement may be technically possible to accommodate. This is principally a policy decision for the US, and will be discussed in the next section.

India – Choices

Having declared intent to deploy an independent BMD structure, India has relatively few policy choices to make. The most significant is how to continue managing their relationship with China in such a way that China does not consider Indian BMD a challenge to Chinese power.[22] The two countries have not had public discussions on the subject.

Another issue – although less significant than in some other countries – is reconciling India's BMD budget with its other defense priorities. India also wishes to modernize its air force and command and control systems in the near term. Their rising GDP and concomitant tax revenues may help New Delhi avoid the hardest choices.

US officials suggest that India lacks a clear vision on what it actually wants missile defenses to do operationally, citing India's approach to questions of force sizing, equipment, and deployment. These issues are interdependent; India cannot decide which missile defense systems to acquire until it has defined its BMD requirements, but only by knowing which systems will be acquired can they decide how many they must procure and where they are stationed.

Sterner questions face the United States. Stabilizing the Indo-Pakistani arms race is a long-recognized US interest. Should the US continue to offer BMD to just one side? Pakistan's ambassador to the US doesn't think so: "If India gets PAC-3, we will either have to ask the US also to provide the same system to us or we will have to think of other ways to have our own missile defense."[23]

If the US commits to fill gaps in India's indigenous coverage, the Indian position on operational control may make the United States decide whether to allow such

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[22] A secondary question is whether to share the secret of how to declare an intent to deploy missile defenses without arousing Chinese ire, as India has so far done successfully.

[23] "Plea to Boost Missile Capability", *Karachi Dawn*, July 2, 2005. In addition to being Pakistan's ambassador to the US, Jehangir Karamat is former chief of the Pakistani armed forces.

control, and over which American-owned systems. It is difficult to find precedent for concession of such control; the US-NATO dual-key system used for deployment of nuclear weapons in Europe during the Cold War may provide a partial answer, but it is unclear whether that will meet India's requirement.

As with other nations studied, the US must also consider the strength of its extended deterrent. While India may not see China as its principal threat, American planners must be ready for any contingency, and will have to consider how to respond to any attack should policymakers choose to do so. Washington will also have to play a delicate political game, balancing Pakistan, a key ally in the war on terror, with new US interests in developing a strategic partnership with today's India. And the US will have to be ready for new challenges should the Pakistani government change hands, or the nation fail entirely.

Chapter 6
AUSTRALIA

Australia – Today

The Australian government's previously ambivalent attitude toward BMD changed significantly once they saw the US BMDS evolving beyond a purely national defense. A BMD initiative first appeared in Australia's 2002 defense review, principally to provide protection of forward-deployed forces and to hedge against possible future missile threats.

Australia has accepted increasing responsibility for regional security and is developing an expeditionary doctrine. While Australian expeditionary forces were not subjected to missile attacks during their 1999-2000 operations in East Timor, a subsequent review of that conflict led Canberra to the view that force protection from missile attack was necessary in order to fulfill its policy approach.

They are much less concerned about homeland threat. Although North Korea's Taepo Dong 2 and some Chinese systems can reach Australian population centers, Australian government officials perceive their country as an unlikely missile target, while noting that this may evolve should Australia continue to assume a more vigorous role in regional affairs or prominently assist US BMD efforts.

The Indonesian government reaction to Australia's missile defense plans was unusually vivid and public.[24] Almost simultaneously with that announcement, Jakarta announced an effort to co-produce short-range (10-30 kilometer) missiles with China, perhaps justifying Australian concerns about force protection.

Australia has some national technical capability to develop missile defenses, with a particular competence in sensors. The indigenous Jindalee radar system has a good capability to detect targets over the horizon, and was at the core of a 2004 Australia – US MOU on cooperative research and development of intelligence, sensing, and reconnaissance systems.

[24] Indeed, it was principally the Indonesian reaction that led to Australia's inclusion in this study.

Additionally, Australia has committed to building three BMD-capable Aegis destroyers. While these ships will not initially carry anti-ballistic-missile weapons (and there is no firm plan to procure such weapons), the Australian Department of Defence considers BMD an essential part of fleet defensive capabilities, just like anti-air or anti-submarine defenses. It is important to note, however, that Australia has not yet made any formal commitment to deploying BMD. In a June, 2005 speech, Secretary Rumsfeld reportedly declared that Australia was capable of limited defensive operations, although it was not clear to which systems he referred.[25]

Australia – Politics

Australia has had very little national debate on BMD. While the subject has come up on occasion, as one Australian official put it, "the issue was a total fizzer." That may change once dedicated BMD hardware is proposed, budgeted, or bought. Any ambitious deployment of BMD could prove a serious challenge, as the Australian defense budget is constrained to 2% of GDP, and is the smallest of any country under study.

While not implying any connection to that budget constraint, Australian policy is unique among the countries studied in the belief that protection by the US BMDS is an integral part of the security guarantees given to US allies. Like extended nuclear deterrence, Australia considers extension of US BMD capabilities as a benefit accruing to nations who side with the US, even without any specific negotiations or agreements covering the subject.

Australia – Technical Issues

The most significant technical issue posed by Australia, its remoteness from threat nations, is partly helpful to defenses. The long flight times required to reach Australia from likely threat countries give optimum chance to detect, identify, and intercept incoming warheads. Existing and planned US assets in the Pacific, particularly at Kwajalein, are well-positioned to assist in that effort. At the same time, that distance makes ICBM-class weapons the primary homeland threat, meaning that

[25] "Secretary Rumsfeld's Remarks To the International Institute for Strategic Studies (Singapore)", US Department of Defense press release, June 4, 2005.

homeland defense would require deployment of a class of defensive missile the US has yet to propose for export.

There is also the question of whether current or planned US space assets will be able to address a launch along the primarily north/south azimuth between the principal threat nations and Australia. A commitment to defend Australia may become significant in the design of those systems.

Existing systems such as PAC-3 and especially SM-2/SM-3 should be sufficient to address the mission of protecting forward-deployed forces, although some consideration will have to be given to the correct suite of sensors to deploy given the range of possible threats.

Australia – Choices

As Australia moves toward BMD capability, the fundamental question is how to size that capability. While expected regional capabilities drive their weapons selection, BMD capabilities currently do not derive from consideration of any particular threat, but are budget-driven.

It is not clear whether the low priority assigned to homeland defense in Australian planning stems from budget constraints or an evaluation of homeland attack as a low-probability threat. As the US and Australia expand their BMD cooperation, the US will have to decide its role in protecting those activities and assets.

Interoperability is another challenge for Australia, but it presents a choice more for Washington than Canberra. It is also an information problem rather than a technical one. Australian officials desire to keep their BMD efforts interoperable with US systems, but they consider the US development path for BMD to be unclear. They particularly lack information regarding what systems may be made available to, or operated on behalf of, other nations. That hinders their ability to focus future funding on interoperable systems, as the Australians aren't sure with what US systems they will need to interoperate. This problem is amenable to easy solution, provided the BMD development path is sufficiently clear to the US.

But the greatest choice for the US is to decide whether Australia is correct in its belief that defense against ballistic missiles is part of the security guarantee implicit in

partnership with the United States, a subject that will be discussed more fully in the chapter on implications for the US.

Chapter 7
REGIONAL OBSERVATIONS

While most issues of missile defense are unique to the country in question, other lessons emerge from considering all five together.

Most importantly, the lack of Asian regional cooperation in developing defenses has led to diplomatic, developmental, and operational inefficiency. Sharing technologies, development costs, data, and more through a regional approach to defense would make defenses both more effective and more quickly deployable. As mentioned in the discussion of Taiwan, a regional approach would also ease diplomatic pressures on any individual nation moving toward BMD.

NATO provides a useful example. Although national approaches to European missile defense differ, NATO has chosen to work as a multinational consortium, with a unified BMD command structure and a single body coordinating requirements, programs, and funding. As a result, previously-overlapping national programs have been rationalized and development is moving far more rapidly than before the separate national efforts were unified.

Further, recent operational studies have shown that regional netting of sensors can cut the requirement for fire units to defend a given area by two-thirds. Nations challenged to provide for BMD deployment within tight budget toplines could clearly benefit from such efficiencies.

Some study participants argue that the lack of a comprehensive diplomatic, economic, and military strategy toward Asia hampers US ability to develop a regional BMD policy. Establishment of a liaison mechanism to resolve BMD issues among the US and its Asian partners would be a useful a first step toward regionalizing Asian BMD. Today, each step in each country's progress toward BMD involves extensive bilateral talks with the US. A standing regional liaison body designated as the point of contact for all BMD issues could speed communication between the US and its partners, bring the lessons of one country's progress to bear on the next, coordinate regional efforts, and minimize duplication. It could also serve as an incubator for a full regional missile security alliance.

Others noted that such cooperation is unlikely, given both internal politics in several of the countries studied and perceived antipathies among them, although improbability of success does not reduce the potential benefits. They note that the bilateral, government-to-government process has worked well, and is more appropriate than attempting to create a regional structure among countries with different intentions, budgets, and philosophies of defense.

While there was no consensus on that point, other significant regional observations arose from study team research and interviews:

- No nation studied expects to defend successfully against a substantial Chinese missile attack in the next twenty years, even with American assistance.

- Nations have much higher confidence of being able to defend against or deter North Korean (or, in India's case, Pakistani) attacks, and consider such attacks more likely.

- Japan is the lynchpin in defending other South Asian nations, including the Antipodes, from any North Korean threat. Simple geography and geometry make it the prime location for basing sensors and land- and sea-based boost and midcourse defenses.[26] Boost-phase defenses could also be stationed in or off South Korea.[27] Taiwan is best situated for land-based sensor and boost-phase interceptor deployments against a Chinese threat to other Asian nations.

- All nations studied see BMD as an acceptable way to deal with regional missile threats, and are pursuing relevant policies (although politics constrain deployment in South Korea.) However, as the possibility of a long-range Middle Eastern threat expands and missile technology proliferates, Asian nations will have to consider meeting extra-regional threats, which may drive much more expenditure on more sophisticated systems. It may also drive changes in policy toward nations basing defensive assets in space.[28]

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[26] This is not meant to imply that such defenses would be owned or operated by Japan.

[27] Except, as noted, for a North Korea-to-South Korea launch.

[28] The study team noted that while little thought has been given in any of the studied countries about the implications of extra-regional threats, their most likely role between now and 2025 would be as proliferators of missile technology, not direct threats to Asian nations.

- Missile defense is not binary. A country is not defended as soon as it announces its intentions or buys its first missile; it must acquire an amount of defensive systems sufficient to deter or meet existing threats, or enter into relationships to provide that defense. Even in Asian countries committed to deploying BMD, force sizing and system effectiveness remain issues.

- Each nation must decide what it is willing to exchange for US protection, especially if the US deploys space-based regional or global defenses. Nations could deploy indigenous systems, accept US protection, or both. Whether that protection would be offered without a *quid pro quo* is a point for US policymakers to address.

- While some posit that deploying defenses might promote arms races in Asia, both North Korea and China have had ambitious missile programs for years in advance of any discussion of defense. Their capabilities appear to be driven by rivalry with other major powers, so any increased effort in response to new Asian defenses would be marginal.

Chapter 8
ISSUES FOR THE UNITED STATES

Current and planned US BMD assets have the capability to fill many of the gaps between threats to American allies and friends in Asia and their indigenous defense capabilities. That statement comes with two significant caveats:

The most significant exception is China. As noted earlier, Chinese air- and sea-defense environments pose formidable obstacles to employment of many US BMD systems, particularly those operating in the boost phase. At the same time, the sheer number of Chinese ballistic delivery systems overwhelms available defenses in any scenario except, perhaps, an attack against the United States proper. No US system scheduled for deployment in the next twenty years addresses this deficiency.

Second, US responses depend highly on geography. Deployment of the right assets in almost any scenario would depend on a significant degree of warning. BMD-capable ships require transit time; cargo aircraft moving point defense systems and ABL need advance notice and a benign air environment to land in. Perhaps most significantly, political accommodation must be reached with the host country, an especial challenge if they are not the country to be defended. The crux will be to get US BMD assets where they are needed, when they are needed there, in sufficient strength to make a difference.[29]

Geography also limits weapon selection and tactics. For example, to defend India against intermediate-range missiles, US defensive systems would have to be stationed in India proper, and sea-based shooters would be too far from much of the country to assist. The short distance between Chinese launch points and Taiwan, or North Korean launch points and South Korea, also stress the capability of planned US systems, and may drive BMD system requirements and architecture, as might a US commitment to defend Australia or other Antipodean nations.

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[29] This situation is analogous to the problem of moving sea and land forces for any mission, with the additional complication that BMD assets will be available only in limited quantities for several years, without an operational reserve available for advance positioning.

Policy Issues

The implications for the US' ability to provide defensive capability system hinge on the answer to one significant question.

As mentioned earlier, Australia – alone among the countries under study – expressed the notion that protection by the US BMDS is an organic part of the security guarantees extended to US allies, just as American nuclear deterrence extends to allies and friends.

This assurance, however, has never been made explicit by any US administration. In 2001, President George W. Bush endorsed assisting allies in deploying defenses, but stopped short of a national policy in which the US would defend any ally from ballistic missiles in the same way that it currently extends nuclear deterrent guarantees.[30]

> To maintain peace, to protect our own citizens and our own allies and friends, we must… work together with other like-minded nations to deny weapons of terror from those seeking to acquire them. We must work with allies and friends who wish to join with us to defend against the harm they can inflict. And together we must deter anyone who would contemplate their use.[31]

Almost all members of the working group believed that if the United States possessed the technical capability to do so, national policy should be to extend missile defenses to allies and friends, albeit with some caveats.[32]

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[30] The associated policy document, NSPD-23, committed to developing and deploying defenses "capable of not only defending the United States and our deployed forces, but also friends and allies" and to "promote international missile defense cooperation," but did not commit to bringing allies within the protection of the US BMDS.

[31] Remarks at National Defense University, 1 May 2001. This speech was widely reported for its declaration that the United States intended to reduce nuclear arsenals and move beyond the ABM Treaty when designing missile defenses, but provisions dealing with missile defense of allies – including the initiation of formal consultations with allies at the Deputy Secretary level – drew far less notice.

[32] The principal caveats focused requiring the protected ally to take major steps toward self-protection first, and offer some *quid pro quo* for the US protection.

A decision to extend US BMD protection to allies carries significant technical consequences. The current and planned BMDS is designed to protect the United States from missile attack, and elements of it support the protection of deployed forces. Not adopting a policy of extending defense to allies would thus have little impact on the system. However, adopting a policy to extend missile defense to allies and friends would require a basic re-examination of the BMDS architecture, current restrictions on technology exports, and establishment of policies to govern possible reimbursement for defensive services provided to other countries.

It is interesting that Australia is the one nation expecting such protection, because, as noted, its distance from China or North Korea means that they could only attack it with ICBM-class missiles, making the job of limited (and particularly terminal) defenses harder, as the re-entry speeds of ICBM warheads require a different class of interceptor than those oriented toward short- or medium-range missiles, as in the case of South Korea.[33] [34] Also, Australia's location could require deployment of dedicated sensor assets and geographic broadening of any space-based systems.

Other policy matters affect Asian nations' ability to improve their own defenses, with or without US help:

- *There is no regional BMD policy, and no move to create one or coordinate BMD efforts.*

While the United States could not impose a regional development or operational structure, the increased efficiency of defense development and concomitant increase in US security from such a structure suggest that encouraging regionalism may be in the US' interest.

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[33] It has been argued that China or North Korea could use ICBM-class weapons against a nearby nation, perhaps solely to make defense more difficult, simply by using lofted trajectories. While this is technically feasible, such trajectories would increase both the missiles' time in sensor windows and the number of defensive systems that could be brought to bear on them. The opposite argument, that shorter-range weapons could be lofted in order to increase re-entry speeds to ICBM-like levels, meets the same restraint. In either case, the nations under study have focused on the most likely or numerically superior threats in fashioning their defenses, not the most technically challenging ones.

[34] Barring the "SCUD on a barge" scenario discussed earlier.

- *Will the US sell GBI or KEI to other countries? Or will those systems be fielded only by US forces?*

The US government has urged some allies to explore purchases of THAAD. Whether the US will make other next-generation systems available for export or simply to deploy them under US control is a question with implications for today's planning by our friends and allies. Should allies like India choose to require operational control over all BMD assets defending their country, an understanding of what systems will be unavailable under such rules will help shape both their current procurement plans and future policies. This could be decided on a government-to-government basis.

- *Are BMD cooperation and extended nuclear deterrence mutually exclusive?*

Some in Asia see the promotion of BMD as a way for the United States to weaken its guarantee of nuclear retaliation for an attack on its allies and friends, essentially transferring the responsibility for blunting an attack from the US deterrent to the allies' defenses. But until defenses are more numerous and effective (and perhaps even then), the US nuclear guarantee and enhanced conventional capabilities that may actually deter an attack are essential to help Asian partners' defense. Reinforcing these guarantees may enhance both the willingness to adopt BMD and the deterrent effect of all legs of the US' "New Triad."

- *Is the defense of allies and friends best served by greater US strategic clarity?*

Many in the international community are uncertain whether the US government would go to war with China to defend its allies and friends. Perhaps most significantly, Beijing is believed to be unsure of this point. A declared US policy of containing Chinese influence could facilitate development of integrated regional defenses, as nations now unwilling to risk Chinese wrath alone came together, secure in United States sponsorship. Instead, strategic ambiguity in Washington and genuine ambiguity in how China is actually going to evolve prevent regional integration from occurring.

- *Will BMD expansion aid in achieving offensive force reductions – and should that be a goal of US policy?*

Asian countries' current missile defense plans lag behind regional threats. Moderation of the threat and its proliferation, if possible, would bring greater balance to the offense/defense equation. The US is engaged in a dedicated and ongoing effort to reduce the offensive threat from North Korea. Some hope that the simultaneous appearance of BMD initiatives in many Asian nations may give China incentive to engage in regional missile reduction talks. Others note that history offers little hope for success in this area.

- *What is the role of space-based weapons?*

Several cases in the study would look very different were the US to deploy operational interceptors in space. This was cited as particularly relevant to defending against Chinese launches, given the challenges to other systems studied. This study considered assets already in the MDA program, which do not include such interceptors. However, a strong case can be made that their deployment could change the offense/defense balance in favor of defenders. Such deployment would be both a major policy decision for the United States and a technical challenge. But such systems would clearly complicate an adversary's calculation and could compensate for difficulties other systems face in addressing certain threats.

- *What are optimal command arrangements for US BMD forces forward?*

US Strategic Command, through its Joint Functional Component Command for Integrated Missile Defense, is responsible for planning and coordinating global operations and support for missile defense. However, forces like Aegis destroyers and PATRIOT fire units deployed to Asia fall under the operational command of US Pacific Command. Missile defense is only one of many missions these forces undertake. In the event of a missile attack, short response timelines demand rapid tasking and a clear command chain. It is thus important that procedures be established in advance to allow rapid transfer of operational control and tasking authority.

In making these policy choices or addressing the technical issues that follow, great care must be taken to maintain strategic stability.

Technical Issues

- *Does the US BMDS architecture require revision in order to fill gaps in Asian missile defenses? If so, how?*

If US policy requires the ability to defend all allies and friends, many existing gaps can be filled by a combination of deploying next-generation systems, creating a regional fusion center for command, control, and intelligence, and including those mission requirements in design of space systems. For example, defense of Australia and some other countries would require expanding the constellations of space assets to cover lower latitudes and to respond appropriately to launches along a primarily north-south axis.

The BMDS would also need formal interface requirements for allied systems, and ways to fuse and redistribute their sensor data and coordinate defensive fires, optimally through a regional center. This is not a new issue. While NATO has adopted a single control center for its missile defense operations, officials expressed confusion as recently as November 2005 at how they are expected to interact with the BMDS.[35]

- *There is no one-size-fits-all solution.*

Each country studied provided a technical or threat challenge that could not be met by defenses optimized for any of the other countries. That means the US architecture will have either to resemble a Swiss Army knife, with an array of tools available to each user, or be remarkably flexible in its ability to reconfigure and/or reassign sensor and shooter assets to provide the best possible solution in each scenario. Indigenous allied capabilities would help, especially if they provided assets tailored to the unique aspects of that country's defense. But if it falls to the US to provide defenses, an architecture flexible enough to handle a range of threat missiles, flight profiles, and launch azimuths would be a considerably more challenging job than defending the continental United States from a few likely threats.

- *While some US systems are useful in almost any Asian scenario, others face great challenges.*

[35] Design of interfaces for allied BMD systems has been an open issue at least since the SDIO Pilot Architecture Study in 1984.

Exploring the defensive options applicable against each country's likely threats revealed some useful observations about currently planned elements of the BMDS. Notably, systems that were designed primarily to protect the United States, whose effectiveness depends on certain launch geometries or times of flight, were least able to contribute to the defense of Asian nations.

- The most likely systems to reach allies first, *PAC-3* and *SM-3* have good capability against many threats studied. They are not designed to cope with ICBM threats or systems that emulate ICBM performance.

- *ABL* may be useful in permissive (or easily suppressed) air defense environments. In the cases studied, it had the greatest utility in Pakistan and North Korea. ABL also offers a useful airborne sensor capability off China even when out of lethal range, and provides a tangible US presence that would complicate an attacker's plans.

- Because of range restrictions in some cases and low altitude/short time flight profiles in others, *KEI* offers marginal utility as a boost-phase interceptor in defending the nations studied. It could be useful in its midcourse mode for longer shots such as China to Japan or North Korea to Australia. KEI would also be useful in some other scenarios if planned land-basing and terminal defense capabilities are realized.

- *THAAD and SM-3*'s high-altitude intercept capabilities have particular value against WMD. Its design capability encompasses long-range, high-speed targets, which would bring a unique capability to some nations, especially if GBI or an eventual terminal KEI is unavailable to a particular nation. THAAD's sensor suite would also expand the defense capabilities of some nations that already have other systems.

- Systems also have helpful *synergies*. While a THAAD battery in South Korea can intercept missiles headed toward that country, its radar will also aid in defense of Japan and other nations. The same is true of Aegis sensors off Japan with regard to Australia and the US, Taiwanese sensors for most other nations, and so on.

At the same time, it is important to recall that characteristics of the threat – especially when projecting twenty years into the future – are inexact. Projections made twenty years ago of today's Chinese military power underestimated their progress, and it is not unreasonable to expect the 2025 threat to vary substantially from today's projections. Those variances rarely go in ways that make defenses easier.

If these observations hold, entirely different US approaches may be required in order to extend effective BMD protection to Asian allies and friends.

Chapter 9
US OPTIONS: THE PATHS AHEAD

Extending BMD protection using the projected (or modified) US BMDS is just one way to defend Asian allies and friends from missile attack. Other US options can be pursued separately or in parallel. Offense-based deterrence, offensive counterforce operations, and threat reduction address the threat in different ways, and if successful can enhance the performance of defenses.

Path: Extending BMD Protection to Allies & Friends

The US offers BMD protection to friends and allies through a continuum of measures that allow nations to proceed at different paces to the level of assistance most consonant with their national goals and policies. They also allow the US to tailor assistance to its strategic interests.

It is worth noting that not all these steps are mutually exclusive; a nation could avail itself of several at once. Ranging from the simple to the complex, they include:

1. *Framework Memorandum of Understanding*. This allows the US and a friend or ally to explore mutual BMD interests while proceeding at a pace suitable to their strategic relationship. An MOU allows the allied country enough access to US technology to "try on" BMD, while sending a diplomatic signal to possible aggressors.

2. *Cooperative Projects*. These can be placed under the context of a Framework MoU, but do not necessarily have to be. One successful example is the Japan-US project started in 1999 on cooperative research into four key technologies for the SM-3 interceptor. Negotiated before the advent of framework relationships, it is now part of a much more robust and comprehensive BMD roadmap under the US-Japan framework agreement.

3. *Cooperative Development or Licensed Production*. These can be logical extensions of successful cooperative research projects, or can be negotiated as such from the start. Examples are SM-3 moving into a co-development phase and PAC-3 licensed production with Japan. These options allow indigenous industry a

substantive and meaningful workshare and are predicated on some amount of technology sharing.

4. *Plug-compatibility*. Although principally a US-side effort, this involves establishing hardware and software interface standards that an allied system must meet in order to interoperate with the US BMDS, and by extension with other allied systems. These standards are inherent to US systems produced under license, but provide design requirements for other indigenous systems.

5. *Allow allies to buy into BMDS block upgrades*. The US BMDS system is designed to evolve in biannual blocks. That allows an ally to purchase upgrades to their existing systems, establish cooperative projects, or begin BMD system deployment at a level of technology with which the country is comfortable, with some ability to budget in advance, and no requirement to move to the next block if the technology or cost were not consonant with national policy. Another approach would be to underwrite part of the block development cost in exchange for input to its requirements or protection by the US system.

6. *Sales*. These can be FMS or Direct Commercial Sales, or, as is happening increasingly often, some hybrid form (e.g. Korea's Aegis destroyers). The 2004 Block 04 sale to Japan, involving Aegis, SM-3, and PAC-3 is an example of an international BMD sale.

7. *Basing*. The presence of US systems in country, especially those operated by US personnel, may have a greater effect in deterring an attack than indigenous ones because of their implicit tie to extended deterrence. They are a tangible demonstration of US commitment to the defended nation, and a deterrent to attack lest the attacker risk general war with the US.

8. *Protection by the US BMDS.* When technology allows, the ultimate option would be for a nation to accept US defensive guarantees. This is available in conjunction with other steps such as co-development of indigenous systems, and each enhances the other. Indigenously-developed or -acquired systems allow the allied government to maintain national sovereignty over defenses, while taking advantage of the defense in depth afforded by the US BMDS. At

the same time, interoperable allied systems can enhance both the BMDS' regional and homeland defense capabilities.[36]

Some of these options would likely be unaffordable to some countries, unless teamed in a regional consortium. Others – particularly the guarantee of protection – would require a substantial US commitment to tailor defenses to the geography of and threats to a particular nation.

Extending missile defense protection may also help forestall development of offensive capabilities by allies who feel threatened by missiles but do not believe they alone could mount a successful defense, in keeping with US policy against offensive proliferation.

The study team made three other significant observations on extending BMD protection to US friends and allies.

- *Defending against Chinese capabilities does not inherently defend against others.*

Although China poses the greatest threat by quantity of weapons and sophistication, other threats are neither lesser nor included. North Korean weapons can require defenses dedicated to or optimized for their geometries and tactics. Regardless of the source, unconventional attacks from unexpected azimuths require omniscient sensors and flexible defensive platforms. Defenses tailored closely to today's Chinese capabilities will lack the flexibility needed to address these other and emerging threats.

- *Systems currently under development could add useful capability.*

Although they have not yet been sold to allies, exporting GBI, KEI, or THAAD could provide useful capability against ICBM-class missiles. Even if such weapons were to remain under US control, this approach may require changes in the Missile Technology Control Regime, particularly if other countries wished to be involved in co-development or co-production.

[36] The study team is indebted to CDR John Pollin, USN (Ret.), for providing the initial draft of this system.

- *The BMDS should ensure connectivity for allied systems.*

The technically and politically challenging task of ensuring connectivity has two positive impacts. Bringing allied sensor data into the BMDS can help improve defense of the United States. Further, exchanging data through the US system offers a "backdoor" way for allies to cooperate in regional defense. This could be a natural outgrowth of – or alternative to – the regional liaison organization referred to earlier.

Path: Offense-Based Deterrence

The offense/defense mismatch between China and any of the countries under study is so great that none even hopes to defeat an attack. Deterring an attack through the threat of offensive retaliation may be less expensive than defenses and may have no less hope of working in the face of an unequal threat.

Although some foreign officials expressed doubts to the study team about the credibility of the traditional notion of extended nuclear deterrence, it continues as the central US policy in forestalling attack against allies and friends around the world. The United States also has non-nuclear means to a similar end, which may be seen as more credible, such as the ability to rapidly place conventional warheads on targets anywhere in the world. While it carries the question of whether the US will really use strategic assets to deter attack on allies, the use of ballistic systems for prompt global strike has the benefit of including non-nuclear options. A major problem in using it in Asian defense scenarios, though, is that conventionally-armed missiles coming toward a target from the United States are indistinguishable from nuclear weapons being delivered the same way, so the risk of a riposte against the United States may not differ from that in traditional extended nuclear deterrence.

Path: Offensive Counterforce Operations

Distinct from offense-based deterrence, which threatens action, actually reducing threats through offensive means would also reduce the need for defenses, and could conceivably bring threats in line with allied nations' defensive capabilities. Whether carried out pre-emptively or in the earliest stages of a conflict, offensive operations would represent an irrevocable US commitment to the ally, creating a state of armed hostility with the targeted country. Those operations would thus require taking down

not only systems targeted at the allied country, but those capable of striking the US itself.

As such operations would also require highly sophisticated offensive systems able to negate or operate inside the range of enemy defenses, maintaining the capability to perform such operations may represent a substantial investment of its own, although one that may already be included in existing defense programs. These could include prompt global strike, mentioned above; cruise missiles; air operations; and other means.

Path: Peacetime Threat Reduction

Defenses limited in quantity are more effective against fewer incoming warheads.[37] A potential attacker with fewer systems has a different cost/benefit calculation from launching a first strike, and the prospect of losing systems to a possible retaliation is more severe. Offensive counterforce operations are also easier with fewer targets to find. Therefore, if it is possible, limiting the proliferation and deployment of offensive systems could make the other paths more effective, although study participants held varied views on the feasibility, wisdom, and historical precedents of such an approach.

Although threat reduction is already part of the six-party talks with North Korea, a regional solution that included reduction in ballistic missiles, not just warheads, could make planning easier for all the countries studied. China and North Korea might be brought in by the opportunity to negotiate the level of offensive weapons they fear Japan will deploy.[38] Care would be necessary to ensure that offensive reductions did not come at the expense of defenses, as that would not improve the offense/defense calculation.

Finally, enforcing existing regimes governing the transfer of missile technology could ease the fears of proliferation that are driving the offensive and defensive arms

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[37] As noted, none of the nations studied expected to field defenses capable of completely countering even known threats. Some consider themselves budget-limited, while others are choosing to tailor defenses to a lesser threat.

[38] One arms control approach would be to use the old Soviet tactic of trading something that doesn't exist for something that does; restricting hypothetical Japanese missiles in exchange for real Chinese or North Korean ones.

race in Asia, and minimize the chances of such technology falling into the hands of non-national groups.

In sum, the United States can follow any of these paths, and several at once. Each of them can lead to greater security not only for friends and allies, but perhaps for the United States itself.

But before taking any of these paths, the US must decide whether it is committed to providing defense against ballistic missiles on behalf of friendly and allied countries that seek it. Only by understanding the depth of the US commitment can Asian nations plan their defenses rationally; only with that answer can the United States plan, design, and create a truly integrated missile defense system; only with that answer can any nation correctly choose among the paths ahead.

Appendix 1: Issues for Further Study

For all we know about the progress of missile defense in Asia, much remains unexamined.

Most significant is *the role of cruise missiles* and defenses against them. Nations faced with rivals' BMD deployments have already responded by promising to proliferate cruise systems. Cruise technology is freely available on the international market, easier to produce than ballistic missiles, and less expensive to weaponize. Such systems are comparatively easy to develop and test covertly. China actively exports CM technology, and has a large fleet of cruise missiles for its own use. And lower cost and complexity make it much easier for non-national groups to acquire and operate cruise systems than ballistic ones.

Moreover, Asia is an excellent region for cruise missile operations. Most tensions there lie between adjacent nations. As the enemy is right next door, the superior range offered by ballistic systems offers little operational advantage in many cases. At the same time, anti-cruise technology is less developed and available than BMD systems, particularly with regard to defending against stealthy cruise platforms.

The United States focused development on ballistic missile threats because its enemies were geographically distant. Asian nations do not have that luxury. There, cruise missiles are already a relevant and growing threat.

While this study has focused on nations deploying defenses, the balance between offense and defense is dynamic. Therefore, another useful area for understanding is *threat nation doctrine and likely responses*. BMD deployment in Asia will lead to a variety of policy and technical initiatives by threat countries seeking to maintain the effectiveness and political value of their offensive forces. A projection of those responses will assist US decisionmakers in keeping defensive technology ahead of the adaptive threat and managing regional stability.

Although *offensive counterforce operations* in hostile air-defense environments have been studied in detail, a focused examination of how they could enhance the effect of missile defenses, and the capabilities of US offensive systems that may enhance BMD performance, would add a new perspective to some of the doctrine and system choices

facing planners and programmers today. A similar look at how BMD systems may aid in counterforce operations would also be illuminating.

Finally, a *classified version* of *The Paths Ahead* would allow greater clarity in discussing threats, allied intentions and programs, and optimal US responses. The enhanced detail would assist in resolving some current operational and resource allocation choices.

Appendix 2: Working Group Members

Participation does not constitute endorsement of all conclusions.

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