Nuclear Risks in Northeast Asia: Opportunities and Challenges for Extended Deterrence and Assurance

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ABSTRACT
In February 2018, the Carnegie Endowment for International Peace and Nagasaki University convened a conference on Nuclear Risks in North East Asia. The conference addressed two sources of nuclear risk in the region. North Korea’s nuclear and ballistic missile capabilities present new challenges to U.S. extended deterrence commitments to Japan and South Korea. How the US, Japan, and South Korea coordinate responses to these challenges will affect the future credibility of their alliances. The allies must navigate complex interests surrounding potential augmentation of military capabilities to deter North Korea, the specific role of US nuclear weapons in strengthening extended deterrence, adapting alliance consultation mechanisms, and broader political and economic issues that affect perceptions of the health of the alliances. A second potential source of risk is Japan’s plutonium stockpile, which may grow further in the future, and the possibility that China and South Korea may also embark on reprocessing programs. There is considerable disagreement over the potential for these developments to exacerbate regional and global proliferation risks, although it remains unlikely that Japan will divert plutonium for military purpose. A range of measures, including unilateral and cooperative approaches, have been proposed to mitigate the risks, although entail significant challenges or limitations.

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Introduction
Nowhere are nuclear dangers growing more rapidly than in Northeast Asia. North Korea’s nuclear program has advanced with unexpected speed and success, raising new and difficult questions about the credibility of the US’ extended deterrence commitments. The ongoing standoff with North Korea has also introduced new sources of uncertainty and escalatory risk into the US–China relationship, which is increasingly characterized by military competition. The US and its Northeast Asian allies, Japan and the Republic of Korea, have a number of policy tools at their disposal to strengthen deterrence and assurance, but each of these entails difficult tradeoffs, raising the
possibility of multiple security dilemmas and new stresses on long-standing partnerships.

In this environment, decisions about civilian nuclear technology also take on added significance. Asia remains a major market for nuclear energy. New nuclear power plants are under construction in China, South Korea and Japan, but the South Korean and Japanese people are also involved in major debates about the future of nuclear energy and the nuclear fuel cycle. Each country is grappling with whether to continue to pursue a closed fuel cycle, in which used reactor fuel is reprocessed to separate fissile materials from radioactive waste products. Japan has amassed a sizable stockpile of plutonium from reprocessed reactor fuel – nearly 47 tons, of which nearly 10 tons remain on Japanese soil under international monitoring and safeguards.

This stockpile does not pose a major proliferation concern, and Japan and its international partners have made significant progress toward securing this material from theft by malign internal or external actors. But the plutonium stockpile remains a lightning rod for international criticism of Japan’s credibility as a principal nonproliferation advocate. Japan’s continued pursuit of the closed fuel cycle also threatens to set a precedent for the reprocessing ambitions of other non-nuclear-weapons states. For instance, South Korea continues to seek a revised nuclear cooperation agreement with the US that would grant it the right to separate plutonium using the pyroprocessing process. Both Japan and South Korea will soon face important decisions about their respective nuclear fuel cycles, which could have far-reaching implications for nuclear and international security in the region and beyond.

In recognition of these related challenges, Nagasaki University and the Carnegie Endowment for International Peace hosted a conference in Washington, DC, on the most urgent nuclear challenges facing international actors in this increasingly tense region. Panelists included a series of highly respected experts on nuclear security, several of whom have been directly involved in shaping US, Japanese or South Korean policy.

Participants first discussed extended deterrence dynamics in Northeast Asia. This discussion featured Rebecca Hersman, Director of the Project on Nuclear Issues, a senior adviser to the International Security Program at the Center for Strategic and International Studies, and a former US Deputy Assistant Secretary of Defense for Countering Weapons of Mass Destruction; Jina Kim, a research fellow at the Korea Institute for Defense Analyses; Jon Wolfsthal, a non-resident scholar with the Nuclear Policy Program at the Carnegie Endowment for International Peace and a special assistant for arms control and nonproliferation to former US President Barack Obama; and Fumihiko Yoshida, Editor-in-Chief of the Journal for Peace and Nuclear Disarmament, Vice Director of the Research Center for Nuclear Weapons Abolition at Nagasaki University, and a nonresident scholar at the Carnegie Endowment for International Peace. Carnegie Endowment Nuclear Policy Program Co-Director Toby Dalton moderated.

Participants then discussed the security risks of civilian plutonium use in Japan and South Korea. This discussion featured Thomas Countryman, former US Assistant Secretary of State for International Security and Nonproliferation; Sharon Squassoni, a research professor of practice at the Institute for International Science and Technology Policy at the Elliot School of International Affairs at the George Washington University; Victor Reis, former US Assistant Secretary of Energy for
Defense Programs; and Tatsu Suzuki, Director of the Research Center for Nuclear Weapons Abolition at Nagasaki University. Carnegie Endowment Nuclear Policy Program Co-Director James M. Acton moderated. The remainder of this article summarizes the key points of the discussion.

**Session 1: Extended deterrence in Northeast Asia**

Japan and South Korea have long-standing alliances with the US, both of which involve a nuclear deterrence component. Each alliance is multifaceted and multipurpose, serving not just to protect US allies but also to safeguard US interests and military forces in the Western Pacific. As these alliances have evolved over time, so too has the role of nuclear weapons in underwriting US extended deterrence commitments. The US-deployed nuclear weapons on South Korean soil for much of the Cold War, withdrawing these weapons in 1991 (Kristensen and Norris 2017). For various reasons, the US has not deployed nuclear weapons on Japanese soil, but instead has given force to its nuclear deterrence commitments to Japan through nuclear and nonnuclear force planning, which implicates the ‘triad’ of US land-, sea- and air-launched nuclear forces, and through the deployment of nuclear weapons on surface ships. Historically, US forward and non-forward-deployed nuclear weapons have served both military and political roles, providing firepower to offset US inferiority in the local balance of conventional forces while providing a tangible symbol of America’s commitment to deterring conventional and nuclear attacks on its allies.

The Carnegie-Nagasaki University conference tackled several questions regarding the future of the alliance system in Northeast Asia and the role of nuclear weapons in it. The discussion was structured as a panel of senior experts featuring former practitioners and scholars from the US, Japan, and South Korea. Panelists considered regional perspectives on the principal factors influencing the credibility of US extended deterrence commitments. Does the credibility of US extended deterrence commitments hinge on the degree to which US allies are critical to core US interests, or does alliance credibility rest on the local balance of US military capabilities? What roles do consultative mechanisms and processes for alliance coordination play in influencing allied perceptions of credibility? Panelists also considered whether North Korea’s improved nuclear capabilities justify changes in the role of US nuclear weapons in the defense of Japanese, South Korean and American interests. If there is a greater role to be played by nuclear weapons in deterring North Korean aggression, should the US and its allies reexamine whether to redeploy nuclear weapons to the region? If nuclear weapons are not to play a greater role, what nonnuclear options exist to bolster extended deterrence? Finally, participants discussed future challenges facing the US–South Korea and US–Japan alliances.

**Sources of extended deterrence credibility for Japan**

Discussions of the credibility of US extended deterrence commitments often take place through the lens of American military planning and strategic priorities. In contrast, the Carnegie-Nagasaki University conference provided a rare opportunity for a discussion based on regional perspectives. Notably, Japanese and Korean analysts differed in the
extent to which they attributed the credibility of US commitments to military capabilities and enduring interests compared to alliance management and consultative mechanisms. While these analysts stressed that both are important, the Korean perspective was more explicit in linking the strength of the alliance to processes for close consultation and the development of shared threat perceptions.

Nagasaki University’s Fumihiko Yoshida began the discussion by observing that Japan has never seriously doubted the US commitment to defending Japan, through nuclear deterrence or otherwise. Japanese analysts and decision makers, Yoshida elaborated, tend to believe that US extended deterrence commitments are inseparable from fundamental American strategic interests – Japan is a ‘core part’ of the US global strategic map. The US–Japan alliance provides US military planners with a network of bases that enable global power projection, while American economic and political interests in the Asia-Pacific depend on a close relationship with a secure Japan. These realities make it difficult to imagine that the US would not come to Japan’s aid in a major conflict. Indeed, Yoshida observed, the US–Japan mutual defense agreement codifies the strategic importance of the relationship by stressing not only Japanese security but also regional peace and order. As regional security challenges have grown beyond those defined by the Cold War superpower competition, so too has the geographic and strategic scope of the US–Japan alliance.

Yet while the scope and challenges facing the alliance have changed over time, the threshold for successful extended nuclear deterrence remains high. A single nuclear weapon used against Japan, Yoshida argued, would be ‘the beginning of the end of the credibility of extended nuclear deterrence’. Japan’s experience as the only nation to have experienced a nuclear attack raises the bar for US deterrent commitments to preventing any and all uses of nuclear weapons. The Japanese public, Yoshida suggested, would be unwilling to support an alliance that resulted in Japan becoming once again the victim of a nuclear attack. Yoshida also suggested that the US shares Japan’s aversion to nuclear use. Yoshida conveyed that many people in Japan do not believe the US would ever use nuclear weapons, even in retaliation. Although nuclear weapons serve as a symbol of commitment and a deterrent to first use against Japan or any other US ally, Yoshida’s comments implied that Japan expects the US to mount a conventional response if deterrence fails. In short, the view from Japan is that the alliance with the US as a whole is firmly anchored in shared interests, but the credibility of US extended nuclear deterrence rests more delicately on deterring the first use of nuclear weapons by all sides.

This perspective, however, raises difficult questions about whether the US could or should rely on the symbolism of nuclear weapons to signal its commitment to its allies. Some analysts and decision makers in the US, Japan and South Korea argue that the US should redeploy nuclear weapons to the Korean peninsula or base so-called ‘non-strategic’ nuclear weapons on US naval vessels as a way to signal a firm commitment to its allies. These deployments would likely be accompanied by a signal or communication that these weapons were earmarked or otherwise designated for service to the allies.

Panelists conceded that forward-deployed nuclear weapons could assure allies existentially – by serving as tangible ‘shiny objects’ to give to anxious allies. But some panelists questioned the strategic value of using nuclear weapons in this way. As
Yoshida observed, nuclear weapons are ‘shiny’ as long as deterrence holds, but quickly lose their shine if nuclear war breaks out. That is, the symbolism of nuclear weapons may depend on a security environment that does not force the US or its allies to seriously question the stability of deterrence or confront deterrence failures. CSIS’s Rebecca Hersman also questioned the strategic value of nuclear deployments without a commensurate assessment of the operational implications. ‘We can [provide] assurances without having to moving things around the parking lot’, Hersman remarked, before adding that the main challenge facing US and allied planners was coming up with a reliable assessment of what US adversaries fear and value, and what capabilities can be brought to bear to affect their calculations.

Carnegie scholar Jon Wolfsthal echoed this line of reasoning by observing that the US and its allies have a ‘poor track record’ of integrating assurance and deterrence demands with operational capabilities. He noted that US nuclear weapons in Europe lack a clear military mission, and the allied aircraft to deliver these weapons are in dire need of refurbishment. Several panelists also questioned whether there was a clear demand from Japan or other allies for tangible forms of nuclear assurance, such as forward deployments. Although panelists did not come to a clear consensus on the value or risks of using forward-deployed nuclear weapons to bolster US commitments to Japan, they doubted there is a need to do so.

Sources of extended deterrence credibility for South Korea

While the discussion of the US–Japan relationship focused on military capabilities and core interests, the discussion of the credibility of US commitments to South Korea emphasized alliance management. Jina Kim of the Korean Institute for Defense Analyses discussed four themes that South Korean officials tend to emphasize in discussions with their US counterparts: the importance of shared threat assessments, the importance of a wide range of options, the possibility of forward-deploying nuclear weapons, and the strengthening of consultative mechanisms. Kim cited progress in some of these areas, while highlighting shortcomings in others (Her contribution to the discussion on forward-deploying nuclear weapons is incorporated into the next section).

Kim alluded to potential differences in how the American vs. Korean governments assess the threat posed by North Korea’s nuclear program. Kim suggested that Washington believes that North Korea is developing nuclear weapons capabilities for use relatively early in a conflict, to compel a settlement favorable to the Kim regime. Seoul is skeptical of this view, believing that there is insufficient evidence that North Korea is developing a nuclear doctrine based on limited coercive nuclear use. Seoul suspects that Pyongyang has not yet developed a coherent doctrine for limited nuclear use or retaliation. North Korea could also be exploring a doctrine of holding nuclear capabilities in reserve during a conventional conflict until it finds itself on the brink of defeat or destruction. North Korea’s emphasis on ICBM development is consistent with a ‘last resort’ North Korean doctrine. Kim added that inconsistencies between US and South Korean threat assessments are difficult to resolve in the absence of a standing joint body or mechanism for real-time threat assessments of North Korean nuclear capabilities.
Kim had a more favorable assessment of the alliance’s military options to deter North Korean aggression. South Korean military capabilities have steadily improved, potentially granting it conventional superiority vis-à-vis the North. However, according to Kim Seoul currently lacks plans for a nuclear response to North Korean nuclear use. South Korea ‘relies’ on US offshore nuclear capabilities, and Seoul is currently not involved in the US nuclear planning process. Rather, South Korea’s posture for deterring North Korean missile strikes is built around the ‘4D operational concept’, which integrates intelligence/surveillance/reconnaissance, precision strike, and air/missile defenses to ‘detect, disrupt, destroy and defend’ against imminent and in-progress North Korean strikes. South Korea is also investing in special forces and strike capabilities to locate and destroy hardened and deeply buried nuclear, military and leadership sites.

Many of these improved operational concepts have been developed jointly with the US, through the Deterrence Strategy Committee process. However, Kim suggested that Seoul is uncomfortable with its exclusion from US nuclear planning. From Seoul’s perspective, a US-dominated nuclear planning process for the Korean peninsula is a double-edged sword. If the US has a higher threshold for nuclear use than South Korea, the risk of nuclear escalation in response to North Korean aggression decreases. This relative stability at the nuclear level of conflict may create the perception in Pyongyang that US nuclear capabilities will not be brought to bear in some scenarios, potentially encouraging limited forms of aggression against the South. South Korea views this potential ‘stability-instability’ paradox with suspicion, because Seoul is committed to deterring all forms of aggression by the North. Indeed, Kim observed, North Korea’s ICBM program is consistent with a North Korean strategy of ‘decoupling’ US nuclear capabilities from limited aggression on the Korean peninsula, by making the US more vulnerable to nuclear retaliation if it attempts to intervene on behalf of the South. Consequently, Seoul would like to move toward the development with the US of operational plans for nuclear response, perhaps through a forum akin to the NATO Nuclear Planning Group.

In general, Kim assessed that the US and South Korea have made progress in developing and strengthening consultative mechanisms within the alliance, and this has helped assure Seoul of the US commitment to its security. The alliance stood up an Extended Deterrence Policy Committee (EDPC) in 2010 to provide a forum for cooperation between each side’s defense ministries to discuss nuclear deterrence matters. The EDPC subsequently evolved into the Deterrence Strategy Committee, which itself is a component of the Korea–US Integrated Defense Dialogue (KIDD) process between the US Defense Department and the Republic of Korea Ministry of National Defense. The proliferation of these mechanisms reflects the recognition within the alliance that stronger consultation can bolster deterrence and shared security.

However, KIDA’s Kim also suspects that there are important differences in how the US and South Korea perceive the value and role of consultative mechanisms. Whereas

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1The stability-instability paradox refers to a situation in which the likelihood of nuclear use involving two nuclear-armed powers is believed by all sides to be extremely low (i.e. strategic interaction at the nuclear level is believed to be ‘stable’). The belief that nuclear use is unlikely can paradoxically lead to ‘instability’ at levels of conflict short of nuclear war, as one or both sides comes to believe that conventional fighting will be unlikely escalate to nuclear use. The paradox rests on an implicit model of conflict akin to a ladder in which increasingly intense forms of fighting emerge hierarchically from less intense fighting.
Washington seems to view consultative mechanisms primarily as forums for information exchange and discussion of concerns, Seoul values these mechanisms for their joint planning functions. Kim’s comments suggest that there are limits to the assurance value of enhanced consultation in the US-Korean alliance absent an operational role for the KIDD forums.

American panelists were skeptical of measures to better assure South Korea by further integrating South Korea into US nuclear planning. Carnegie’s Wolfsthal observed that it is difficult for states to cede sovereignty, even to close allies. Governments are especially loath to give up exclusive control over nuclear planning, given the centrality of nuclear weapons to feelings of national security. While Wolfsthal had ‘no qualms’ about further integrating South Korea into nuclear planning, he expressed concerns about potential unintended consequences. Hersman added that the alliance was already ‘fully nuclearized’. From Washington’s perspective, deterrence credibility is a function of both capability and will. The side making the deterrent threat must be willing to follow through with its threat, and it must be able to do so. Changes in an alliance’s capabilities bolster deterrence, but they do not compensate for deficits in will. And, Hersman argued, the sources of shared will in the alliance are already strong. At the heart of the alliance are shared economic, political, and diplomatic interests, as well as large numbers of US military and civilian personnel throughout South Korea.

CSIS’s Hersman recalled that since President Obama took office in 2009, the US has grappled with how to best link US nuclear capabilities to developments on the Korean peninsula. The outcome of this process was that the US nuclear arsenal would remain coupled to South Korea politically, rather than operationally or technically. North Korean aggression against the South would threaten core American, as well as South Korean, interests. These threats would raise the salience of nuclear weapons in the course of the US mounting a conventional defense of its interests in Korea and the region. However, North Korean aggression would not trigger operational plans or create technical constraints that would independently increase the risk of nuclear use by the US. Indeed, Hersman suggested that a stability-instability paradox on the peninsula may be an improvement. In fact, Hersman saw indications that first-strike incentives were increasing in the region.

Hersman observed that these conclusions emerged during an administration, and in an international environment, in which the US was consciously seeking ways to reduce the role of nuclear weapons in its overall national security strategy. However, the Obama administration also recognized that it could bolster deterrence by deepening the political, economic and military integration between the US and South Korea. Hersman expressed some concern that recent moves by Washington away from economic cooperation and integration with South Korea could undermine deterrence far more than changes in military plans and capabilities. Moving forward, the role of nuclear weapons in US, allied and adversary planning may change, but US alliances continue to rest on a foundation of shared, entangled interests.

**The role of nuclear weapons in deterring aggression in Northeast Asia**

Of particular interest to panelists and participants at the conference were proposals to further US–South Korea nuclear integration and ‘coupling’ by forward-deploying US
nuclear weapons on the Korean peninsula and in the region. These deployments would involve weapons and basing options that are more permanent and regionally focused than the occasional passage of US nuclear-armed submarines through Pacific waters. One possibility is to base US nuclear gravity bombs and cruise missiles on US bases in South Korea, Japan, or further afield in the region, such as in Guam. Another possibility is to reconstitute the US nuclear sea-launched cruise missile (SLCM) capability formerly provided by the Navy’s nuclear-armed Tomahawk (also known as TLAM-N). The Navy formerly deployed TLAM-N on surface combatants and attack submarines, but President George H.W. Bush retired these in 1991, as part of his ‘Presidential Nuclear Initiatives’ (Koch 2012).

Few commentators called for these weapons to be made available for use by South Korean forces, akin to nuclear-sharing arrangements within NATO. While justifications vary by commentator, advocates for forward-deployed weapons argue that they could serve a symbolic role, as tangible symbols of the US commitment to Korea and Japan, while providing prompt and flexible nuclear options that do not involve launching ‘strategic’ nuclear-armed intercontinental or submarine-launched ballistic missiles. Although media accounts portray US allies as the primary source of demand for forward-deployed nuclear weapons, experts from Japan and South Korea painted a more complex picture.

Nagasaki University’s Yoshida conveyed that most Japanese do not take the possibility of regional nuclear deployments particularly seriously, even in light of new North Korean nuclear developments. Japan, Yoshida observed, has lived with a nuclear-armed China for many years, and many of China’s nuclear-tipped missiles are of intermediate range, capable of striking targets in Japan. Yet Japanese citizens are relatively comfortable with current approach to US extended deterrence. Moreover, Japanese citizens do not judge the stability of deterrence in terms of the different types or yields of China’s nuclear weapons. The Japanese public takes a similar view of US nuclear weapons – the first use of nuclear weapons in battle since 1945 would mark a pivotal moment in world history regardless of the types of nuclear weapons used or the bases from which they were launched.

Nevertheless, Dalton observed that most observers believe the Japanese government is the principal advocate for a replacement for TLAM-N. Wolfsthal added that language in the 2018 US Nuclear Posture Review (NPR), and the forthcoming Missile Defense Review, partially reflects Japanese concerns that deterring Chinese conventional or nuclear aggression requires greater ‘tailoring’ of US nuclear capabilities to Chinese plans and thinking. Japan’s Foreign Minister expressed support for the recent NPR, saying he ‘highly appreciates’ the 2018 NPR and welcomes its commitment to extended deterrence in light of a deteriorating security environment.2 Anti-nuclear activists have criticized the majority Liberal Democratic Party (LDP) for its support for the NPR, which calls for development of a low-yield option for the US Trident D5 submarine-launched ballistic missile. Yoshida, however, cautioned observers that the Foreign Minister’s statement did not necessarily involve an endorsement of specific provisions contained in the document. Yoshida suggested that while the Abe government

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2 Ministry of Foreign Affairs of Japan, “The Release of the U.S. Nuclear Posture Review (NPR) (Statement by Foreign Minister Taro Kono),” 3 February 2018, http://www.mofa.go.jp/press/release/press4e_001893.html.
welcomes the NPR, individual members and officials may disagree on the merits of specific provisions, including those that imply fielding a low-yield Trident or a new nuclear SLCM. Rather, Yoshida interpreted the Foreign Minister’s statement as expressing support for the US commitment to deterrence through nuclear and nonnuclear capabilities contained in the NPR. In fact, Yoshida noted, the leader of the Komeito Party, one of the LDP’s coalition partners, expressed concern about the low-yield D5 modification, fearing it could lead to a proliferation of more usable nuclear weapons.

Hersman added that while the NPR was criticized for its somewhat ‘inartful’ statement that US nuclear weapons exist to deter both nuclear and nonnuclear aggression, this statement reflects the recognition that China and Russia themselves view nuclear weapons as part of a broader ‘integrated set of capabilities’. Hersman concluded that the US lagged behind its adversaries in its ability to assess and plan comprehensively for nuclear threats in a ‘whole-of-government’ way. The 2010 NPR, in contrast, made explicit the understanding that nuclear weapons are inseparable from their wider military-political context. Seen in this light, a low-yield option for the Trident D5 missile provides a ‘relatively proximate and fairly low-cost’ option for a limited nuclear response to North Korean, Chinese or Russian nuclear use. In contrast, Hersman noted that there has not been a final decision whether a new SLCM is required, and once the decision is taken, procurement of the system would take several years. Several panelists warned against portraying a new SLCM as a requirement for alliance credibility. The capability, they observed, is controversial in both the US and allied governments. More damage could be done to US alliances by terminating the SLCM program after it begins than by never fielding the weapon in the first place.

Jina Kim, from the Korea Institute of Defense Analyses, added that while the South Korean government frequently calls for the US to make more frequent its rotation of so-called ‘strategic assets’ through the region, the government is not seeking the redeployment of nuclear weapons to the region. Kim noted that the debate in South Korea over forward-deployed nuclear weapons revolves around a set of pros and cons. Advocates stress that forward-deployed weapons can be used as bargaining chips in future talks with North Korea. Advocates also highlight latent South Korean concerns about ‘decoupling’, which refers to the possibility that the US would be unwilling to use nuclear weapons in a conflict on the peninsula because North Korea has attained the capability to hold the US homeland at risk with its own nuclear weapons. Consequently, South Koreans are confident in conventional deterrence but my doubt the stability of nuclear deterrence.

In contrast, skeptics argue that forward-deployed nuclear weapons may be exceedingly vulnerable to preemptive attack, which may create incentives to use them early in a conflict. Skeptics also worry that forward-deployed weapons could provide North Korea with justification for further expansion of its nuclear arsenal. Kim noted that South Korea still observes the 1992 Joint Declaration on the denuclearization of the peninsula, which bars both North and South from developing, receiving or possessing

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3 South Korean officials frequently use the term ‘strategic assets’ to mean nuclear and non-nuclear capable aircraft, such as B-1, B-2, and B-52 bombers, as well as major weapons systems such as aircraft carriers and nuclear-powered submarines.
nuclear weapons.\(^4\) South Koreans may also dislike the notion of stationing nuclear weapons on their territory. In general, Kim said, people in Korea do not have a strong familiarity with nuclear deterrence so they may find the visibility of forward deployments compelling and reassuring.

Other panelists shared the concern that a lack of familiarity with nuclear deterrence and operations may lead the public or officials in US allied countries to call for reassurance measures, such as forward-deployed weapons or new nonstrategic nuclear capabilities, that have unintended negative consequences. Forward deployments or new nuclear capabilities may implicitly entail future requirements for costly modernization and refurbishment. Similarly, steps to alter these deployments or capabilities, for purely operational reasons, may create the mistaken perception that the US is wavering in its commitments. Hersman added that the ‘cement’ binding the US to its allies is its ‘skin in the game’ – that is, shared and entangled political and economic interests.

**Future challenges to alliances in Northeast Asia, prospects for cooperation**

Carnegie’s Toby Dalton asked panelists to identify future challenges for the alliance system in Northeast Asia. He wondered whether the recent US emphasis on an aggressive tempo for military planning and shows of force creates concerns among the allies that they might find themselves ‘entrapped in reverse’, that is, pulled into a conflict fomented by US behavior. Nagasaki University’s Yoshida responded that the strong rhetoric from President Trump and North Korean leader Kim Jong-Un raised concerns in Japan about the potential for escalation. But he also cautioned that the leaders’ rhetoric might not signify an abandonment of diplomatic engagement or a move toward military action. He suspects that there is more candor and transparency at the level of government-to-government communication between the US and Japan.

Carnegie’s Jon Wolfsthal outlined four challenges to US alliances in Northeast Asia: crisis management, alliance management, strengthening shared values, and responding to a mix of regional and strategic-level threats. First, Wolfsthal observed that there is insufficient coordination between Washington and Seoul on how to respond to North Korean rhetoric and behavior. Wolfsthal said the US and South Korea need to sharpen their ability to coordinate and communicate during risky situations by improving threat assessment and presenting Pyongyang with a united front. This coordination, he said, should emphasize avoiding nuclear use and preparing and educating the public.

Second, Wolfsthal argued that alliance cohesion between the US and Korea as well as Japan was at a low point. He recalled that the last time US alliances seemed so strained was after a series of troop withdrawals in the 1970s. He echoed Hersman’s call for greater entanglement of US and allied interests, but he has called on the Trump administration and Congress to avoid inflammatory statements, such as calling for the evacuation of Americans from Seoul. This rhetoric has damaging effects on alliance cohesion, he argued. He added, however, that in Japan, alliance management is under less strain, in part because the Abe government has made alliance management

\(^4\)Joint Declaration of South and North Korea on the Denuclearization of the Korean Peninsula, available at [http://www.nti.org/media/pdfs/aptkoreanuc.pdf](http://www.nti.org/media/pdfs/aptkoreanuc.pdf).
a priority. Beneath the surface there are tensions, however, especially given the persistence of hawkish elements in the Abe government.

Third, Wolfsthal highlighted the challenge of strengthening shared values among the allies, including strengthening democratic freedoms and process. Both the US and its allies ‘need to recommit’ to the democratic values they share. Fourth, Wolfsthal warned about the rise of increasingly integrated and ‘mixed’ regional and strategic threats. The US must find ways to strengthen deterrence on the Korean peninsula without undermining strategic stability with China. South Korea’s adoption of the THAAD missile defense system, which China protested, is one example of how threats and risks in Asia are increasingly interdependent and fraught with tradeoffs.

**Assessing recent North Korean behavior**

Panelists concluded by discussing recent North Korean nuclear behavior, including statements by Kim Jong-un expressing his willingness to enter talks with South Korea and the US. KIDA’s Jina Kim explained that North Korea reached out to Seoul for two reasons. First, the Kim regime was sufficiently confident that its nuclear program was nearly complete, which allowed the North to negotiate from a position of strength. Second, the North may be trying to persuade the South that coexistence with a nuclear-armed North Korea is possible. Both moves attempt to leverage the South’s greater willingness to negotiate to drive a wedge in the alliance with the US.

At same time, Kim noted, the current South Korean government is committed to managing the security environment peacefully. The South’s complement to the US campaign of maximum pressure is coercive diplomacy. Seoul aims to create pressure on the North to rollbacks its nuclear program while providing Kim with a set of choices that do not cause him humiliation. However, Carnegie’s Toby Dalton wondered whether Seoul was concerned that the North’s overtures reflect a strategy of buying time for the nuclear program to mature. Kim responded that the time created by diplomatic endeavors was not enough for the North to erode the South’s conventional military superiority or to develop robust nuclear capabilities for preemptive or retaliatory attacks. Moreover, Kim observed, while North Korean nuclear rhetoric increasingly emphasizes preemptive or retaliatory uses, most North Korean public statements emphasize deterrence of attacks by the US or South Korea. Preemptive attacks on the South or the US do not feature in North Korean rhetoric.

**Summary**

How credible is the US extended deterrence commitment to its Northeast Asian allies? What is the risk of nuclear escalation in Northeast Asia today? Panelists generally agreed that extended deterrence in Asia remains stable and robust. US and allied military capabilities are sufficient to deter major conventional provocations by North Korea and China. Whether the same can be said for nuclear deterrence, however, depends on how regional adversaries assess the strength of the political commitment of the US and its allies to their mutual defense. The discussion implied that Washington could do more to strengthen those ties that bind it to its allies, including through
greater economic integration and improving the mechanisms for joint defense and
deterrence planning.

**Moderator’s postscript (Toby Dalton)**

The US alliance system in Northeast Asia is under unprecedented strain. Advances in
North Korea’s nuclear warhead design and long-range missiles give it – if not now, then
in the very near future – the ability to target US territory with nuclear weapons. This
development raises thorny questions about the credibility of US extended deterrence
commitments, whether Washington will be as committed to the defense of South Korea
and Japan in the event of a Korean Peninsula contingency if it means potential
retaliation on US soil. Indeed, many experts in the region and in the US express
growing concern about the prospect of alliance decoupling.

Unfortunately, though growing regional challenges ought to provide sufficient
impetus for developing common threat assessments and joint approaches, the trend
appears to be the opposite. As all of the panelists in the Nagasaki-Carnegie conference
discussion on extended deterrence pointed out, considerable efforts to build alliance
connectivity over the last decade have not resulted in a shared assessment of North
Korean objectives and likely coercive behavior as a result of its nuclear weapons
acquisition.

Diversity of views on North Korea within the strategic communities of all three
countries is no doubt a major contributor to the lack of common alliance-wide
assessments. But the larger issue appears to be divergence between the three govern-
ments over sources of alliance credibility and the extent to which military capability –
and specifically nuclear weapons – should constitute the primary focus of efforts to
strengthen deterrence.

In Seoul, analysts argue for the development of coordination mechanisms that go
beyond information-sharing to include joint operational planning for nuclear conting-
encies as the most important means to strengthen extended deterrence. But the
consistent majority of South Korean public opinion supports US redeployment of
tactical nuclear weapons, among other measures, which suggests that there is a gulf
between expert and public opinion about how to improve deterrence credibility. That
gap reflects more on an assurance deficit, rather than problems with deterrence, per se.

In Tokyo, defense experts are primarily concerned about strengthening deterrence of
nuclear first use. In this regard, the Japanese government welcomed the commitment to
that objective conveyed by the 2018 US NPR. But this should not be read as blanket
support for investment in a range of new US nuclear capabilities, including a low-yield
submarine-launched missile or a nuclear SLCM, as a way to address perceived deter-
rence gaps.

In Washington, there are two simultaneous developments that mesh poorly with these
regional views. First, there is a president whose actions and statements, especially on trade
policy, place new stress on the existing political and economic ‘coupling’, thus exacer-
bating concerns about the will of US leaders to live up to alliance commitments. Second,
defense officials charged with nuclear policy chose in the 2018 NPR to frame extended
deterrence requirements (based on perceived deterrence gaps) largely in terms of nuclear
capabilities, which could have unintended and unfortunate spill. But it is far from clear
that allies agree on the scope of potential deterrence gaps, based on divergent threat perception, let alone that such gaps require more nuclear capability rather than other adjustments in nuclear and nonnuclear strategy and posture.

Rather than bringing the US, Japan and South Korea into better alignment on deterring North Korea, therefore, the current policy trajectories in all three states unfortunately suggest more dissonance ahead. There may be brief reprieve if nuclear negotiations with North Korea take flight, but there, too, the allies have quite different objectives and interests that will frustrate efforts to form a common script.

Session 2: Security risks of civilian plutonium use in Northeast Asia

A second source of nuclear risks in Northeast Asia is the stockpiling of plutonium derived from civilian nuclear power production. Despite greater scrutiny of the merits of nuclear power since the Fukushima nuclear accident, Japan’s nuclear energy program is still geared to a closed nuclear fuel cycle, which involves the separation of fissile materials from used reactor fuel, and its fabrication into fuel suitable for reuse. However, Japan’s plutonium stockpile has grown faster than its ability to produce and burn MOX fuel. As a result, Japan possesses a plutonium stockpile of about 47 metric tons, about 11 tons of which remain on Japanese soil – potentially enough for hundreds to a thousand nuclear weapons.

The stockpile is not the result of a deliberate policy of plutonium accumulation. Rather, the stockpile is a product of the domestic politics of Japan’s nuclear energy industry, which has enjoyed significant autonomy in the development of Japan’s nuclear energy plans (Acton 2015). Nevertheless, the stockpile has become a lightning rod for international criticism of Japan’s commitment to nonproliferation. Some observers worry that Japan’s exceptional production of fissile materials as a nonnuclear weapons state under the Non-proliferation Treaty (NPT) sets a dangerous precedent for other states seeking enrichment and reprocessing capabilities. Japan’s neighbors may also harbor genuine doubts about Japan’s intentions regarding future nuclear weapons production. Others may simply find it politically convenient to allege hypocrisy on the part of Japan and the US.

Moreover, Japan’s reprocessing activities do not take place in a vacuum. Japan’s plutonium stockpile and its nuclear fuel cycle choices loom in the background of debates over the future of nuclear energy and reprocessing in South Korea. South Korean nuclear industry and many in Seoul are fierce advocates for reprocessing technology. Advocates stress that South Korea needs its own approach to reprocessing, known as pyroprocessing, to assure a reliable and secure source of reactor fuel and to reduce a growing spent fuel stockpile (Hibbs 2017). Some in the South Korean nuclear industry may also wish to market fuel recycling services to international customers. However, the US is hesitant to consent to pyroprocessing. The future of the fuel cycle in

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5The nuclear fuel cycle comprises all the activities required to transform unprocessed fissionable or fissile materials – predominantly uranium ore – into fuel that can be loaded into a nuclear reactor. A ‘once through’ or ‘open’ fuel cycle involves mining, processing, and enriching uranium; transforming enriched uranium into fuel elements; using these elements (“burning”) to produce electricity in reactors; safely removing used reactor fuel and rendering spent fuel safe for long-term storage. The ‘closed’ fuel cycle involves reprocessing spent fuel to separate fissile components from waste products. The reprocessed fissile components can then be used again as reactor fuel, typically in a blend with uranium known as ‘mixed oxide’ fuel, or MOX.
South Korea is further in doubt given the ruling Moon government’s plans to phase-out nuclear power.

The Carnegie-Nagasaki University conference considered the risks of separated civilian plutonium in Northeast Asia and discussed ways to mitigate these risks. The panel featured internationally recognized experts with backgrounds in nuclear industry and diplomacy in the US and Japan. Moderator James Acton divided the discussion into two parts: first, panelists considered the nature of the problem, and then they discussed potential solutions.

**The problem of separated plutonium**

Tatsu Suzuki, director of the Research Center for Nuclear Weapons Abolition at Nagasaki University and former Vice Chairman of the Japan Atomic Energy Commission (JAEC), began with an overview of the separated plutonium situation in Japan today. He observed that Japan’s stockpile would not grow beyond its current mass of 46.8 metric tons until after 2021 because Japan Nuclear Fuel has postponed restarting the Rokkasho reprocessing plant until 2022. This postponement reflects a need to comply with updated regulatory requirements rather than a shift in national policy toward reprocessing.

Indeed, Suzuki observed, the Japanese government has only taken tentative steps toward exerting deliberate control over the issue of the plutonium balance. In 2016, the Japanese Diet passed legislation that altered the funding mechanism for reprocessing and spent fuel management.\(^6\) The legislation created a ‘Nuclear Reprocessing Organization’ (NURO) to provide a financial vehicle for reprocessing and MOX production. NURO contracts with Japan Nuclear Fuels, Ltd. (JNFL) for the operation of reprocessing and MOX production facilities at Rokkasho, in Aomori Prefecture. NURO must submit its reprocessing plans to the Ministry for Economy, Trade and Industry (METI) for approval. But, Suzuki noted, the 2016 legislation is silent about the future of the plutonium stockpile. Although supplementary resolutions, adopted concurrent with the spent fuel legislation, require METI to consider the JAEC’s views regarding the future of the plutonium balance before authorizing restarting operations at Rokkasho, METI is not required to adopt the JAEC’s recommendations.

Eventually the government will have to contend with how the reprocessing plant will address the plutonium balance, particularly in the context of an uncertain future of nuclear energy in Japan. Only seven nuclear reactors are operating in Japan as of March 2018, three of which burn MOX fuel.\(^7\) Resumption of operations at MOX-burning plants in Niigata Prefecture may be delayed further due to local opposition. In other words, Suzuki noted, less than 10 MOX-burning plants will be operating in Japan for the foreseeable future – not enough to make a sizable dent in the plutonium stockpile.

\(^6\)Agency for Natural Resources, “The Cabinet Approved the Cabinet Orders for Stipulating the Effective Date of the Spent Nuclear Fuel Reprocessing Implementation Act,” Ministry of Economy, Trade and Industry, 27 September 2016, http://www.meti.go.jp/english/press/2016/0927_02.html.

\(^7\)Six reactors, two MOX-fueled, were operating at the time of the conference. Genkai-3 resumed operation on 23 March 2018. Genkai-4 may resume operation before the publication of this article. See “Southwestern Japan nuclear reactor back online after 7-yr hiatus,” Daily Mainichi, 23 March 2018. https://mainichi.jp/english/articles/20180323/p2g/00m/0dm/052000c.
Suzuki expressed some optimism that Japan’s plutonium policy will shift in the coming years. The JAEC may review its current ‘no plutonium surplus’ policy in recognition of the failure of the policy to actually reduce plutonium levels. Suzuki pointed to two potential changes. First, Japan may seriously weigh a proposal to calibrate the size of its plutonium stockpile and future production to projections of market demand for MOX fuel. Second, Japan may research combining reprocessing with direct disposal of excess reprocessed plutonium. It is unclear whether these proposals will coalesce into a coherent plan for addressing the plutonium balance by 2021, when Rokkasho’s reprocessing operations will resume.

Coincidentally, 2021 is also the year that the US and South Korea are due to complete a Joint Fuel Study on the feasibility of different plans to reduce South Korea’s spent fuel stockpile, including through pyroprocessing. As Sharon Squassoni, from the George Washington University, explained, pyroprocessing is somewhat different from the PUREX process used by Japan. Unlike PUREX, pyroprocessing is an electrometallurgical and a ‘dry’ process – pyroprocessing extracts fission products from spent fuel using a molten salt bath rather than a water/acid solution. Pyroprocessing also does not result in the separation of fissile elements, namely plutonium, from other fission products. Proponents maintain, therefore, that pyroprocessing is more proliferation-resistant than PUREX. Skeptics, however, including US government technical experts, maintain that plutonium can be separated from other transuranic elements and fission products through electroreduction and electrorefining techniques (Horner 2011).

South Korea’s plan for pyroprocessing also involves a different approach to consuming reprocessed fuel. Japan’s reprocessing facilities separate plutonium, which is then blended with depleted or natural uranium to make MOX fuel. MOX is then burned in light-water reactors, which are otherwise identical economically or technically from light-water reactors operated throughout Japan and elsewhere. In contrast, Korean researchers plan to burn reprocessed fuel in a new generation of fast-neutron reactors. Unlike light-water reactors, fast-neutron or breeder reactors can induce fission in transuranic elements as well as plutonium. However, fast reactors have never been commercialized successfully, and may pose significant safety risks in large-scale operation.

Because it operates nuclear technologies received through cooperation with the US, South Korea must receive US consent before it can reprocess spent fuel. The US and South Korea signed a reviewed nuclear cooperation agreement in 2017 that reflected a compromise between Washington and Seoul’s positions. While the US did not agree to consent to reprocessing, it agreed to undertake a 10-year Joint Fuel Cycle Study on various approaches to spent fuel management. This compromise essentially delayed a final decision on reprocessing.

South Korea maintains that pyroprocessing will reduce both the volume and toxicity of its spent fuel stockpile. The issue of volume – that is, available space for spent fuel storage facilities – is nontrivial for South Korea. South Korea is an exceptionally dense and mountainous country, with few ideal sites for spent fuel storage. Squassoni, however, was skeptical that pyroprocessing would address the space issue. She argued that pyroprocessing may reduce the volume of unprocessed spent fuel, but it may not reduce the heat produced by remaining waste products. Because the size of a facility required to safely store nuclear waste depends on the heat that the waste produces, pyroprocessing may not in fact result in significant space savings for waste storage.
Squassoni was also skeptical that pyroprocessing could meaningfully reduce the toxicity of South Korea’s spent fuel. Pyroprocessing will still result in a number of highly radioactive waste products, namely cesium-138 and strontium-90. South Korea maintains that it will store the most radioactive remaining elements in aboveground facilities, where they may continue to pose hazards. Meanwhile, the transuranic nuclides separated from the spent fuel will then be burned in a fleet of fast-neutron reactors. But Squassoni observed that even if South Korea were to overcome the economic and safety barriers to commercializing fast reactor technology, it would need to construct dozens of fast reactors to begin to reduce spent fuel levels. By some calculations, she reflected, it would take South Korea 100 years to consume its current stockpile of spent fuel.

Finally, Squassoni expressed uncertainty about the future of nuclear power in South Korea. Today, South Korea is an ‘expert and advanced’ power in nuclear energy, and has attained this status through significant scientific and economic investments. While President Moon Jae-in remains committed to phasing out nuclear power, the one-term tenure of South Korean presidents makes it hard to ensure lasting policy change. A reversal of South Korea’s nuclear plans will depend on a commitment to phasing-out nuclear power by multiple presidents. The National Assembly has convened a commission of experts to examine pyroprocessing, a process that may result in future cuts to research and development into the technology.

American participants varied in their perception of the risks posed by Japan’s reprocessing activities. Victor Reis, the former US Assistant Secretary of Energy for Defense Programs, said that although any amount of separated plutonium is inherently risky, Japan has also made significant progress toward securing its plutonium. Reis stressed that cooperation between the US and Japan on a range of nuclear security issues remains strong and ongoing. US should continue to raise its concerns regarding Japan’s plutonium, Reis argued, but plutonium is also not the most pressing issue in US-Japan nuclear relations. Programs to ensure the security of Japan’s plutonium ‘are working’, Reis said.

Former US Assistant Secretary of State Countryman disagreed. His concerns ‘extend beyond nuclear security’, although he echoed Reis’s praise of the US officials who worked with Japan to improve its plutonium security. Countryman’s principal concern is that Japan and its partners will become complacent in addressing concerns about the plutonium. Although Japan is the US’ ‘most consistent’ partner in its nonproliferation efforts, Japan’s credibility in these efforts is undermined by the fact of its accumulation of plutonium. The US and Japan should work to reduce the risk posed by the stockpile, reassure neighbors and promote greater consistency between Japanese energy policy and Japan’s standards for nonproliferation.

Countryman was more concerned about the risks posed by South Korea’s reprocessing ambitions. Countryman suggested that the primary motive behind South Korea’s request for US consent for reprocessing was to enjoy a similar status for Japan. However, he also expressed concern that South Korea was seeking a ‘hedge’, or a latent capability to develop nuclear weapons. South Korea, he noted, has explored developing nuclear weapons in the past, and South Koreans are more supportive of developing nuclear weapons than the Japanese people. In this context, Japan’s continued maintenance of a plutonium stockpile has the potential of creating the perception in South Korea of a double standard by the US.
Mitigating the risks of separated plutonium

Carnegie’s James Acton then asked the panel to discuss potential ways to mitigate the risks posed by Japan plutonium stockpile and South Korea’s reprocessing ambitions. He asked panelists to discuss the range of possible solutions, ranging from unilateral action by Japan to give up its plutonium, to bilateral pressure from the US, to multilateral cooperative measures.

Nagasaki’s Tatsu Suzuki began by discussing the possibility that Japan might give up ownership over its stockpile. Doing so would raise confidence in the region about Japan’s peaceful nuclear intentions. Moreover, Japan could repatriate its plutonium if it so desired. Alternatively, Japan could turn custody of the plutonium remaining on its soil over to the United Kingdom while maintaining formal ownership of the stockpile. Suzuki noted that either proposal would probably encounter significant domestic opposition. Japan views its stockpile as an important energy resource, and expatriation raises concerns that Japan may not have access to it. Moreover, Acton noted, these proposals do not take into account the divergence in how Japan values the plutonium compared to other countries: Japan believes the plutonium has positive financial value to it, while other countries believe the plutonium represents a net financial cost. One possibility, Countryman and Acton discussed, is to identify a future price for the stockpile and defer or amortize payment. Japan would also have to overcome deep-rooted sovereignty concerns. South Korea could also forebear from pursuing further reprocessing activities, although the prestige, energy security and waste management motives identified above make this an unlikely possibility.

Countryman proposed that Japan faced a number of options to assure its neighbors and others about its plutonium stockpile. The ‘minimum’ the government of Japan could do is to exert positive control over the plutonium balance issue. This statement of responsibility would extend beyond current policies that require Japanese industry to take into account the status of the balance. Japan could go further, and provide a ‘medium’ level of assurance by commissioning an economic study of the closed fuel cycle. The study could identify scenarios in which reprocessing makes economic sense. If, for instance, the study finds that reprocessing is profitable only with 18 plutonium-powered reactors, Japanese policy makers might ask if this is realistic given current rates of plant construction. An independent body that does not have an economic or political interest in reprocessing should conduct the study. The ‘maximum’ Japan could do to reassure its partners, and others in the region, is to pursue a trilateral – China, Japan, South Korea – moratorium on reprocessing.

Japan, South Korea, and possibly China could agree on a trilateral suspension of plans to close the nuclear fuel cycle. Squassoni noted that the suspension would be more of an extended pause, because neither Japan nor South Korea are currently reprocessing spent fuel, while China remains ambivalent about its civilian reprocessing plans. Countryman and Acton observed that neither the US nor South Korea could propose such a suspension credibly – only Japan, with the most advanced reprocessing program in the region, could lead an effort to forswear this technology. Conversely, an American call for a regional suspension – after previously consenting to Japan’s reprocessing activities – could seem especially hypocritical. However, several panelists observed that multilateral agreements in Asia, particularly involving China, Japan, and
South Korea are rare and suffused with the histories of conflict between these three Northeast Asian powers.

Alternatively, the US could attempt to exert some leverage over Japan through its nuclear cooperation agreements. The US–Japan ‘123’ agreement is formally due to expire in July 2018, but the agreement remains in force until terminated by either party, and there seems to be little desire in Tokyo or Washington to renegotiate the agreement. Countryman also objected to the characterization of nuclear cooperation agreements as sources of leverage. In his experience, the State Department was loath to view 123s as sources of leverage or pressure. Reis, moreover, argued that the decline of the US domestic nuclear industry was undermining the leverage the US might have in renegotiating nuclear cooperation agreements with allies.

Finally, participants discussed whether there were opportunities for domestic constituencies in Japan and the US to attempt to involve themselves more in fuel cycle decisions. As Suzuki noted in his opening remarks, there is greater interest in the Japanese Diet to provide for policy oversight of the plutonium balance issue. Countryman added that the US Congress also has an interest in periodically reviewing nuclear cooperation agreements.

**Summary**

What are the risks posed by Japan’s plutonium stockpile and South Korea’s reprocessing ambitions? Participants seemed to agree that, in fact, Japan’s plutonium stockpile poses few direct nuclear security and proliferation risks. Rather, Japan’s plutonium and the future of its fuel cycle activities have implications for the future of nonproliferation efforts in the region. Japan’s credibility as an advocate and example of the peaceful exploitation of nuclear energy within the confines of the NPT is at risk so long as Japan maintains a large stockpile of weapons-usable plutonium. Japan’s unique status as a plutonium-producing nonnuclear weapons state, which lays raises to the fore tensions inherent in the NPT grand bargain, also makes it difficult to question the economic and technical rationale behind South Korea’s reprocessing plans. Participants were divided on the best way to respond to concerns about plutonium and reprocessing in Northeast Asia. There was a rough consensus, however, that Japanese leadership is crucial for the success of unilateral or multilateral forms of assurance. Tokyo could take unilateral steps to assure its neighbors that it takes the plutonium question seriously, in part through greater transparency about the economic and technical merits of its closed fuel-cycle plans. But multilateral measures would also require Japan to take a central role.

**Moderator’s postscript (James M. Acton)**

The stockpiling of plutonium in North East Asia is undesirable – there was no dispute about that on my panel. More controversial was the question of whether reducing Japan’s plutonium stockpile should be a priority for the US.

Japan possesses 47 tons of plutonium, about three-quarters of which are stored in France and the United Kingdom, where it was produced. Even before the accident at Fukushima Daiichi Nuclear Power Plant in 2011, Japan was far behind schedule in implementing its plan to burn this material in nuclear reactors. Now, with most
reactors still offline following the accident, it lacks any kind of a credible plan to draw down this stockpile.

Vic Reis presented a persuasive case that this stockpile should not be a major concern for the US. Japan has made significant progress in enhancing its security to reduce the risk of theft. Tokyo has an outstanding nonproliferation track record and there is little prospect of its proliferating. And, for its part, Washington is facing other more serious nonproliferation challenges.

All three of these claims seem, to me at least, to be largely correct – yet they miss the wider impact of Japan’s plutonium stockpile.

Today, Japan is the only non-nuclear-weapon state with a civilian reprocessing program (even if plutonium-extraction operations at its industrial-scale Rokkasho Reprocessing Plant are currently suspended, pending the completion of more robust post-Fukushima safety checks). Japan’s actions, therefore, set an important precedent for other non-nuclear-weapon states that may operate civilian reprocessing facilities in the future.

Worryingly, were such a state to start stockpiling plutonium – perhaps in an effort to develop a ‘breakout capability’ that would enable it to manufacture a nuclear weapon rapidly – the example set by Japan would provide it with a powerful justification for its actions. In fact, precisely because Japan has been a model nonproliferation citizen, especially in terms of its commitment to and adherence with International Atomic Energy Agency safeguards, the precedent would be particularly persuasive.

To be sure, with one exception, no other non-nuclear-weapon state is likely to initiate a civilian reprocessing program in the near future. The one exception is South Korea, however, for which the precedent set by Japan is likely to be particularly influential. Moreover, it would be foolhardy to base policy on the assumption that efforts to prevent the spread of reprocessing will be successful indefinitely. If they should fail, it would be important to have established a clear norm that any production of plutonium should be commensurate with demand.

In fact, the precedent set by Japan could be relevant to more than reprocessing. Non-nuclear-weapon states with enrichment programs could cite Japan as justification for their stockpiling another weapon-usable fissile material, highly enriched uranium – an argument that might be persuasive to a large segment of the international community.

Unlike many proliferation risks, the challenge posed by Japanese plutonium is one that Washington can actually do something about.

In general, the US is gradually losing the ability to influence the technological trajectories of other states’ nuclear programs and hence steer them away from sensitive fuel-cycle technologies. Occasionally, as in the case of Iran, a state may present such an acute proliferation threat that Washington may feel compelled to marshal its national power – through diplomacy, sanctions, sabotage and even military threats – to coerce a change in behavior. Yet, it would be neither practical nor desirable, to adopt this approach in anything but the most serious of cases.

Unusually, the US does have the ability to shape Japan’s thinking about its fuel-cycle plans through quiet diplomacy. The US and Japan are close allies whose nuclear industries are deeply intertwined. Moreover, the US was Japan’s original supplier of nuclear reactor technology. For the US to transfer a reactor, it must first conclude a nuclear cooperation agreement that typically forbids the recipient from extracting plutonium from spent fuel
without prior consent. Unusually, Washington gave Tokyo such consent in 1988 on the basis that Japan had plans to use any plutonium it extracted.

The US should quietly remind Japan of the basis on which prior consent was granted and emphasize that it is a privilege not a right. It should also indicate, again in private, that unless Japan develops and implements a credible plan to ensure its plutonium stockpile does not increase and is drawn down slowly over time, Washington may be forced to rethink its grant of prior consent.

Realistically, given the slow pace of reactor restarts following the Fukushima accident, Japan will need a few years to develop such a plan and even longer to start drawing down its plutonium stockpile. But it seems reasonable to expect Japan to announce a plan prior to the restart of Rokkasho Reprocessing Plant, which will occur in 2021 at the earliest.

Such plan would not only mitigate the potentially negative precedent set by Japan’s plutonium stockpile, it would actually set the new and positive precedent that non-nuclear-weapon states planning to produce weapon-usable fissile material should declare, in advance and in detail, how they intend to use it. This outcome would be a worthwhile investment of Washington’s diplomatic energies.

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