

Responses to a Nuclear North Korea

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North Korea's nuclear weapons program has sparked a regional crisis with profound implications for Northeast Asian security and for the survival of the nuclear nonproliferation regime. Pyongyang's nuclear brinkmanship, pursuit of uranium enrichment technology, and acknowledgement of a nuclear deterrent capability have precipitated a cascade of events that may destabilize the East Asian region and overwhelm existing nonproliferation barriers. Recent North Korean statements have emphasized the need for a nuclear deterrent to ensure North Korea's security. North Korea claims to have completed efforts to reprocess 8,000 spent fuel rods, which might produce sufficient plutonium for five to six nuclear weapons (in addition to the one or two nuclear weapons the CIA believes North Korea now possesses). North Korea has restarted its 5 MW(e) research reactor and may eventually resume construction on two other larger reactors. The precise status of North Korean uranium enrichment efforts is unknown, but it will be difficult to monitor and constrain this capability. Despite the expressed desire of all sides to solve the issue peacefully, it is far from certain that diplomacy can halt North Korean efforts to improve its nuclear

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weapons capability.

The goal of securing a nuclear weapons-free Korean peninsula remains the top priority of the United States and other countries in Northeast Asia. However there is also a need to think about the consequences a nuclear North Korea would have for regional security. A glimpse at the worst-case outcomes of the current nuclear crisis illustrates the dimensions of the problem. If left unchecked, North Korea could develop both uranium enrichment and plutonium production facilities that produce large quantities of fissile material. This would not only enable North Korea to test nuclear weapons, but also permit the regime to deploy a significant number of operational weapons on Nodong missiles that can reach Japan and (eventually) on Taepodong-2 missiles that might be able to reach the United States. Worse still, an isolated North Korean regime facing economic collapse would have sufficient quantities of fissile material to sell weapons-grade material (and possibly complete nuclear weapons) to rogue states or terrorist groups seeking to acquire the ability to inflict mass casualties on the United States and its allies. The nightmare of nuclear weapons or fissile material for sale to the highest bidder might become a reality. Increasing North Korean nuclear capability could also precipitate a nuclear domino effect that leads Japan, South Korea, and even Taiwan to move toward acquiring nuclear weapons of their own, in what could be a death blow for the nuclear nonproliferation treaty.

Given the risks and high costs of a military confrontation, the best outcome of the present crisis would be a negotiated agreement that verifiably eliminates North Korea's current nuclear weapons capability and future nuclear weapons potential. Despite the purported consensus on the objective of a non-nuclear Korean peninsula announced at the six party talks in Beijing in late August 2003, this outcome is not assured and may ultimately turn out to be unattainable. While the United States and other regional actors must continue efforts to eliminate North Korea's nuclear capabilities, it is also essential to think about how to deal with less desirable outcomes if diplomacy fails.

One approach is devising "nuclear firebreaks" to contain the damage increasing North Korean nuclear weapons capabilities would do to East Asian security and to the nuclear nonproliferation regime. This concept merits examination for several reasons. First, it is prudent to be prepared for the possibility that diplomatic efforts to remove North Korea's nuclear weapons capability will not succeed. If Pyongyang has decided that nuclear weapons are essential to regime survival, then it may not be willing to give them up. Thinking about how to deal with a nuclear North Korea ahead of time can help policymakers prepare for this contingency. Second, the United States and other Northeast Asian countries must weigh the alternatives to an agreement as part of their negotiating calculus. This requires developing and evaluating alternative policy options. Third, it is possible to imagine a negotiated settlement of the Korean nuclear crisis that would constrain, but not completely eliminate, North Korea's nuclear weapons potential. A flawed agreement would be a highly unsatisfactory outcome, but might nevertheless be superior to other available policy options. It is important to consider the security and nonproliferation implications of an imperfect deal and to think about how the United States and other countries in the region would respond. Finally, prolonged negotiations and intensified military containment of North Korea may be necessary to achieve a Korean peninsula free of nuclear weapons. The United States and its allies must consider how to deal with North Korea's nuclear weapons capability (and the prospect of intensified North Korean nuclear brinksmanship) over the course of lengthy negotiations. Some of the policy options discussed in this article may be helpful.

This paper makes a first attempt at exploring "nuclear firebreaks" that might help contain the damage North Korean nuclear weapons would do to East Asian security and to the nuclear nonproliferation regime. It begins by reviewing the objectives and concerns of the key countries involved in the crisis. It then examines possible stopping points for the North Korean nuclear weapons program, assesses the impact varying levels of North Korean nuclear capability would have

on regional security, and considers possible policy measures that might dampen the negative proliferation and regional security impact of greater North Korean nuclear capability.

I . Interests and Objectives of the Six Parties

United States: Washington seeks the visible, verifiable, and irreversible elimination of North Korea's nuclear weapons capability and potential. The Bush administration feels that its attempts to increase pressure on North Korea are bearing fruit, as evidenced by its tactical victory in forcing North Korea to accept multilateral talks that include South Korea and Japan. Washington wants to make any negotiations five against one as much as possible, with the goal of convincing Pyongyang that North Korea must dismantle its nuclear program if it wants to improve relations with its neighbors and to keep the regime in power. Participation in the talks allows the United States to demonstrate that it is taking a reasonable diplomatic approach to the crisis, but the U.S. objective is to force North Korea to back down. It is unclear whether Washington is really interested in a negotiated settlement. Some Bush administration officials believe North Korea would cheat on any agreement and that regime change is the only permanent solution. However, the United States has also indicated that it may be willing to grant certain concessions, such as some kind of multilateral security guarantee, if North Korea dismantles its nuclear program first. Given skepticism about North Korean intentions, the United States will insist upon effective verification of any agreement and push North Korea to make concessions first. The Bush administration will seek ways to disguise any concessions that might make it vulnerable to charges of rewarding North Korean blackmail, and will also need other countries to pay for any economic assistance to North Korea.

North Korea: Pyongyang's principle objective is regime survival, but its tactical objectives include obtaining a formal security guarantee from Washington and removing political and legal obstacles to

economic assistance from Japan, South Korea, and international financial institutions. Analysts differ as to whether North Korea would ultimately be willing to completely give up its nuclear weapons capability and potential in a negotiated settlement, or whether the regime will insist on retaining a limited or ambiguous nuclear capability². North Korea has sought to portray itself as being reluctantly forced to pursue nuclear weapons due to security threats from the United States. North Korea has attempted to play the other five nations against another and exploit differences with respect to the urgency of disarming North Korea and the quality of a verification regime that would be necessary for an agreement. North Korea might, for example, eventually make a settlement offer acceptable to China and South Korea but unacceptable to the United States in order to sow tension and disunity among the other parties. The extent to which international pressure is affecting North Korean resolve and Pyongyang's ultimate willingness to make the tough concessions necessary for a diplomatic solution are unclear.

South Korea: Seoul seeks a negotiated settlement that would remove the North Korean nuclear threat, but is reluctant to pressure Pyongyang to the point where the regime might collapse or lash out militarily. South Korea would like to see North Korea adopt economic reforms and a less threatening military posture that might facilitate eventual reunification. At the same time, South Korea also worries about possible U.S. military actions that might escalate into a larger military conflict. South Korea has sought to coordinate its position with the United States and Japan while pushing North Korea to make the concessions needed to resolve the crisis. If North Korea puts forward a serious offer to give up its nuclear weapons capability in exchange for a security guarantee and economic assistance, South Korea will likely try to obtain an agreement that addresses U.S.

2 For an assessment of North Korean motivations, see Phillip C. Saunders, *Confronting Ambiguity: How to Handle North Korea's Nuclear Program*, *Arms Control Today*, Vol. 33, No. 2 (March 2003), pp. 11-15. [http://www.armscontrol.org/act/2003_03/saunders_mar03.asp]

objections in order to achieve a diplomatic solution.

China: Beijing has been forced to take a more active diplomatic role in order to ward off negative outcomes such as a major military conflict, a permanent North Korean nuclear weapons capability, or a regime collapse that might send North Korean refugees flooding into China. Beijing played a critical role in arranging the six-party talks, and its efforts to resolve the crisis have helped improve relations with Washington. At the same time, China has continued to supply North Korea with critical food and energy assistance and sent a military delegation to Pyongyang to meet with Kim Jong Il and top officials prior to the six party talks in August 2003. China's short-term goal is to halt escalation (by either side) toward a military conflict and to keep the negotiation process going. China would prefer a negotiated settlement that encourages North Korea to adopt economic reforms and to improve relations with its neighbors. China's long-term goal is a nuclear-free Korean Peninsula, but an interim agreement that resolved the immediate crisis (without permanently removing North Korea's nuclear weapons potential) might also be acceptable to Beijing.

Japan: Tokyo is concerned about North Korea's nuclear weapons capability, deployment of Nodong missiles that can reach Japan, and North Korea's past abduction of Japanese citizens. Influential Japanese security analysts have recently raised concerns that a U.S. security guarantee for North Korea might weaken extended deterrence. Tokyo does not want a deal that resolves the nuclear issue but still leaves Japan vulnerable to North Korean missiles. If a negotiated settlement involves significant economic assistance to North Korea, Japan would be expected to foot a large part of the bill. However Japan will want to ensure that the missile and abduction issues are resolved before any significant transfer of resources to North Korea takes place. Japan hopes to raise the abduction issue multilaterally, but may ultimately have to negotiate with North Korea on a bilateral basis. (There are some indications that North Korea is willing to release children of the abductees, but a number of Japanese citizens are still missing or unaccounted for). Japan feels the five nations should try to get a

complete package deal so that North Korea will be unable to drive a wedge between them. Some Japanese analysts worry that unexpected North Korean concessions might expose differences between the other parties.

Russia: Moscow's reemergence as a key player in the Korean negotiations represents a major victory for President Vladimir Putin, who has steadily increased Moscow's attention to Pyongyang since entering office in 2001. Russia has now won a place (at least temporarily) as a "middle man" between the United States and North Korea. Moscow sees the Beijing talks primarily as an opportunity to promote long-term Russian economic, political, and security interests in Northeast Asia, including: (1) a greater role for the Russian Far East in regional trade; (2) regional integration and the facilitation of multinational cooperation in law enforcement, economic development, and regional energy networks; and (3) a comprehensive settlement to the Korean Peninsula crisis that would normalize conditions on Russia's southeastern border--thus preventing the possible outflow of millions of North Korean refugees into the ill-prepared Vladivostok area. Russia's unprecedented joint maritime maneuvers with Japan and South Korea show a new commitment to work with other regional players who were formerly enemies. Russia seeks to pursue a more comprehensive strategy aimed at promoting regional integration.

II. Impact of Increasing North Korean Nuclear Capability

Diplomats regularly state that a North Korean nuclear weapons capability is intolerable. The unpleasant reality is that the United States and North Korea's neighbors have probably been living with a North Korea armed with nuclear weapons since the mid-to-late 1990s. This is certainly not a desirable situation, but to date the consequences have not been catastrophic. A number of factors affect how North Korea's neighbors (and the international community) perceive and respond to

its nuclear weapons capabilities. These include whether these capabilities are assessed, claimed, or demonstrated; the potential number of weapons available (both now and in the future); North Korea's ability to deliver nuclear weapons to particular targets; whether nuclear weapons and fissile material are likely to be exported to other countries or groups; and whether North Korean nuclear weapons capabilities are intended for offensive purposes, defensive purposes, or as bargaining chips. The latter two points depend not only on North Korean capabilities, but also on assessments of North Korean intentions.

Increasing North Korea nuclear capabilities will clearly have negative consequences for regional security and the health of the nonproliferation regime. However the consequences do not depend *solely* on changes in actual capabilities. Changes in assessments of North Korea's nuclear capabilities (and changes in the confidence leaders have in the reliability of these assessments) can also affect the impact North Korean capabilities have on regional security. For example, one of North Korea's objectives in the negotiations that produced the Agreed Framework was to preserve ambiguity about how much plutonium it had secretly reprocessed (and whether this was sufficient to produce one or two nuclear weapons). The possibility that North Korea *might* have one or two nuclear weapons gave Pyongyang leverage in the negotiations and some degree of deterrence against a U.S. military attack. At the same time, ambiguity reduced Japanese and South Korean political and military reactions as North Korea moved from a secret stock of plutonium towards actual nuclear weapons during the mid-1990s. The important point is that actions that clarify North Korean capabilities—such as authoritative intelligence information, unambiguous North Korean statements, or observable tests—may stimulate reactions *even if actual North Korean capabilities do not change*.

Similarly, evidence of North Korean intentions (or changes in assessments of North Korean intentions) can also affect responses to changes in North Korean nuclear capabilities. North Korea must have

excess fissile material in order to have the capability of exporting nuclear material to other countries or groups. However, this *capability* alone may not stimulate strong international reactions. Hard evidence that North Korea was contemplating nuclear exports (especially to terrorist groups) or changes in assessments of North Korea's willingness to export might provoke much stronger international responses. Similarly, assessments of whether North Korea's nuclear weapons are intended for offensive purposes (such as nuclear blackmail or enabling a conventional military attack), defensive purposes (such as deterring attack or ensuring regime survival), or as bargaining chips will affect international responses³. Differences in assessments of North Korea's nuclear intentions are an important factor underlying differing threat perceptions and policy preferences between the United States, China, Russia, South Korea, and Japan.

North Korea's approach to international negotiations further complicates the matter. North Korea's negotiating tactics frequently involve the use of threats, insults, and brinkmanship to place its adversary at a disadvantage⁴. Because North Korea's most important source of negotiating leverage lies in its nuclear weapons capabilities and nuclear weapons potential, Pyongyang has strong incentives to misrepresent its capabilities and intentions in ways that it feels enhance its bargaining power. This may involve using ambiguity to send different messages to different international audiences. (Pyongyang's shifting accounts of what was said in the October 2002 meeting with U.S. Assistant Secretary of State James Kelly reflect an effort to use ambiguity to exacerbate differences between the United States, Japan, and South Korea.) It may also involve efforts to either exaggerate or understate capabilities and intentions. For example, Pyongyang's threats to conduct a nuclear weapons test or to export nuclear materials

3 Although North Korea's nuclear weapons program was likely initiated and pursued for multiple reasons, the relevant question is which objective is most important if today's North Korean leaders are forced to choose. The author thanks Kim Tae-woo for pressing him to clarify this point.

4 See Scott Snyder, *Negotiating on the Edge: North Korean Negotiating Behavior* (Washington, DC: U.S. Institute of Peace, 1999).

in the April 2003 Beijing talks should probably be regarded as a negotiating tactic to increase pressure on the United States rather than a serious statement of intentions. But the difficulty of reading North Korean intentions clearly creates additional uncertainty and complicates the task of formulating a unified policy approach⁵.

Despite these caveats, increasing North Korean nuclear capabilities are still the single factor most likely to stimulate strong international reactions. It is therefore worth examining what might happen if North Korea continues to proceed down the path of increasing nuclear weapons capability. This should not necessarily be considered a continuous (or inevitable) process. There are discrete levels of increasing capability that might prompt discontinuous international reactions. Moreover, North Korea might halt efforts to increase its nuclear capabilities due to economic or technical constraints, a sense that existing capability was sufficient to meet security needs, as part of a unilateral decision to avoid negative international reactions (such as economic sanctions or a pre-emptive attack), or as part of a negotiated settlement. We should therefore look for both inflection points (where increases in North Korean nuclear capability prompt discontinuous or disproportionate international reactions) and potential stopping points (where North Korean nuclear capability might be temporarily or permanently halted).

One of the key constraints on North Korea's nuclear weapons capability is the availability of fissile material that can be used to produce nuclear weapons. There are two paths to the production of fissile material for use in nuclear weapons: reprocessing spent nuclear reactor fuel to produce plutonium and enriching uranium to create highly enriched uranium suitable for weapons use⁶. These alternate

5 See Daniel A. Pinkston and Phillip C. Saunders, *Seeing North Korea Clearly*, *Survival*, Vol. 45, No. 3 (August 2003), pp. 79-102. [<http://cns.miis.edu/research/korea/450079.pdf>]

6 Uranium enrichment involves increasing the ratio of the relatively rare U235 isotope to the more prevalent U238 isotope. Enrichment can be performed by mechanical centrifuges, gaseous diffusion, laser separation, or electromagnetic processes. Iraq pursued all these pathways to uranium enrichment; North Korea is

paths have different implications for North Korea's near-term nuclear weapons potential. Key distinctions between the North Korean uranium and plutonium programs include the following:

- 1) Plutonium production is limited by the supply of spent reactor fuel; uranium enrichment is potentially unlimited (assuming access to enrichment technology and supplies of natural uranium).
- 2) Reprocessing the existing 8000 spent fuel rods could yield plutonium for 5-6 additional weapons. Additional production of plutonium will require restarting the existing 5 MW(e) reactor (which has reportedly recently begun operating) and/or finishing construction on 50 and 200 MW(e) nuclear reactors. The time required to restart the 5 MW(e) reactor and to complete construction on the other reactors imposes a mid-term cap on North Korean plutonium production that does not necessarily exist for a highly-enriched uranium program. On the other hand, North Korea's plutonium program is probably much more advanced than its uranium enrichment efforts.
- 3) The United States knows where the key facilities for North Korea's plutonium production cycle are located, and can potentially target them (though an attack would be unlikely to eliminate existing weapons or plutonium stocks). The United States does not know where North Korean HEU facilities are, and assumes that any HEU facilities would be hidden underground and therefore be difficult to attack.
- 4) The reactors and reprocessing facilities involved in North Korea's plutonium production are relatively easy to observe using technical means, making it easier to assess their production capability and operational status. Any North Korea HEU facilities are hidden and difficult to observe. Moreover, HEU facilities using centrifuges will have varying production rates depending on the number of centrifuges employed and their

likely focusing on centrifuges.

efficiency. This makes it more difficult to estimate North Korea's potential future stock of highly-enriched uranium.

- 5) Uranium enrichment technology can be transferred to other countries or groups relatively easily and covertly; nuclear reactors and plutonium reprocessing technology are harder to transfer and easier to detect.

These differences suggest that technical limitations on North Korean fissile material production may create stopping points, especially for plutonium production. For example, if North Korea does not operate its existing 5 Mw(e) reactor or complete the two larger reactors, its potential stock of plutonium would only be sufficient for seven or eight weapons (assuming that the 8000 fuel rods are fully processed, a task that may not have been completed). This constitutes a discrete jump from the one or two weapons worth of plutonium available before reprocessing of the fuel rods began, but could be a verifiable stopping point for North Korean plutonium production. If the 5 Mw(e) reactor is refueled and operated at full capacity, North Korea could produce 5.5 kg of plutonium annually, enough for one additional weapon per year. In a sense, plutonium production is a batch process that produces chunks of fissile material (once the spent fuel rods are reprocessed). If the other reactors are completed, they would significantly increase North Korea's plutonium production capability⁷.

Conversely, uranium enrichment represents a more continuous production process, where the number of centrifuges and their operating characteristics determine the amount of HEU produced. This makes it more difficult to assess North Korea's HEU production capability or to be confident that all HEU facilities have been located. Available information suggests that North Korea has acquired HEU technology and may be constructing a facility or facilities to house this

⁷ The 50MW(e) Nuclear Power Plant in Yonbyon-kun could produce as much as 55 kg of plutonium per year, enough for 7-10 weapons. The 200MW(e) Nuclear Power Plant located in Taechon could produce as much as 220 kg of plutonium per year, enough for 30-40 weapons. See Daniel A. Pinkston and Stephanie Lieggi, *North Korea's Nuclear Program: Key Concerns*, February 12, 2003.

equipment. However it is unclear whether North Korea has all the components necessary to build large-scale production facilities. Reports that North Korea is seeking to acquire large quantities of aluminum tubes suitable for use in centrifuges suggest that Pyongyang still needs significant outside assistance to begin large-scale HEU production. U.S. government estimates suggest that North Korea could produce sufficient HEU for 2-6 bombs per year once its facilities are fully operational. However these estimates are based on incomplete information about the status of North Korea's enrichment program⁸. This suggests that it will be much easier to verify the status of North Korea's plutonium production efforts than it will be to verify that a covert HEU program is not underway or to estimate how much HEU North Korea is actually producing. Although the North Korean plutonium program is more advanced, the HEU program may ultimately be a more difficult problem to address.

The following analysis examines the potential impact of increasing levels of North Korean nuclear capability. Although the negative security impact of increasing North Korean nuclear capability will also be affected by the degree of clarity about actual North Korean capabilities and assessments of North Korean intentions, the consequences for regional security and the nonproliferation regime are likely to worsen as North Korea passes each of these thresholds.

Development of a larger but still ambiguous nuclear weapons capability : North Korea probably passed this threshold when it began reprocessing the 8000 spent fuel rods that had been stored at Yongbyon under the Agreed Framework. The exact status of the reprocessing effort is unclear⁹, but North Korea is likely to eventually reprocess all 8000 rods and acquire plutonium for 7-8 nuclear weapons. This action

8 See Fred McGoldrick, The North Korean Uranium Enrichment Program: A Freeze and Beyond, in *Verifying North Korean Nuclear Disarmament: A Technical Analysis*, Carnegie Endowment for International Peace, Working Papers, No. 28 (June 2003), pp. 17-36.

9 Some press reports suggest that reprocessing efforts at the Yongbyon facility have halted, but it is not clear whether this is a diplomatic signal or the result of technical difficulties.

has spurred concerns in the United States, South Korea, and Japan. The most immediate direct impact is on the Japanese debate about defense policy. Japan's decision to procure the PAC-3 missile defense system, changes in laws regarding the use of force against incoming missiles, and increased interest in acquiring offensive strike capabilities can all be traced at least partly to North Korea's efforts to produce more weapons-grade fissile material.

Declaration of an overt nuclear weapons capability: North Korea's August 2003 statement in the six party talks that it has a nuclear deterrent constitutes a quasi-official declaration of nuclear weapons capability. Although U.S. intelligence agencies assess that North Korea has had nuclear weapons since the mid-to-late 1990s, there is still some question about whether the capability actually exists. The North Korean statement removes some ambiguity about their capabilities. Although an overt declaration does not necessarily increase North Korea's war-fighting potential, it would alter the public debate and give hawks in the United States, South Korea, and Japan ammunition to argue for more assertive responses. In terms of the global nonproliferation regime, an overt declaration of nuclear weapons capability confirms suspicions that North Korea successfully evaded its NPT obligations and acquired nuclear weapons. This may serve as an example for other countries. The damage to the nonproliferation demands upon whether North Korea pays a price for its violation of its NPT obligations. Although some economic opportunities are currently being withheld from North Korea, it is not clear how high a price North Korea will ultimately pay for its nuclear ambitions. Moreover, the desire to force North Korea to pay stiff penalties to deter other would-be proliferators may conflict with the policies needed to cap North Korean nuclear capabilities, forcing countries to confront difficult trade-offs.

Nuclear weapons testing: North Korean diplomats threatened to conduct a nuclear test at the April 2003 talks in Beijing. According to press reports, North Korea has established facilities for "cold testing" of the high-explosive components of a nuclear weapons design and

probably has a facility to conduct a full-scale nuclear test. Although a nuclear test would be an authoritative confirmation of North Korean nuclear weapons capability, there are some important reasons why North Korea may not be eager to conduct a test. First, a test would consume a significant portion of North Korea's covert stock of plutonium. If the stock shrunk from enough plutonium for one or two weapons to enough plutonium for zero or one weapons, even a successful test would introduce doubt as to whether North Korea still possessed a nuclear weapon. This constraint will ease if North Korea has reprocessed the 8000 spent fuel rods to produce additional plutonium. Second, a failed nuclear test would eliminate ambiguity about North Korea's nuclear weapons capability and expose the fact that North Korea does *not* have operational weapons. This would significantly weaken North Korea's negotiating leverage. Third, by removing ambiguity about North Korean nuclear capabilities, a nuclear test is likely to stimulate strong negative reactions from the United States, Japan, and the international community. This might increase North Korea's international isolation, decrease economic interactions with other countries, and force countries such as China to disassociate themselves from North Korea. These costs may collectively outweigh the benefits from proving that North Korea does have nuclear weapons.

Although a nuclear weapons test is a binary event (in that it either succeeds or fails), there are a number of steps short of an actual test that can be used to develop international negotiating leverage. For example, India threatened to test nuclear weapons in the mid-1990s and made test preparations that were observed by U.S. intelligence. The North Korea representative's statement in the April 2003 talks that whether North Korea tests depends on what the United States does can be interpreted as an attempt to develop leverage by using the threat of testing without having to face the negative international consequences of actually testing. One could imagine a sequence of threats, observable test preparations, and offers to delay or cancel tests that might precede a North Korean nuclear weapons test. Conversely, if North Korean leaders feel the need to demonstrate their nuclear

weapons capability to improve their international negotiating position or to improve their domestic standing with key groups that support the regime, a test could occur with little or no notice.

The impact of a North Korean nuclear test on regional security would depend heavily upon Japanese and South Korean perceptions and reactions. Discussions with Japanese and South Korean officials and security analysts indicate that a North Korean nuclear test would shift the domestic policy debate and force both governments to take tougher actions in response¹⁰. If the test is interpreted as an indicator of North Korean hostile offensive intentions, then both countries are likely to seek to enhance their military capabilities to deter a North Korean attack. This might take a number of forms including both defensive systems (such as ballistic missile defenses) and offensive systems (such as ballistic missiles or ground attack aircraft). At the limit, this might include efforts to pursue nuclear weapons capabilities of their own (although this would likely depend on each country's degree of confidence in the U.S. nuclear umbrella). An underappreciated point is that Japanese and South Korean officials and security analysts harbor suspicions of each other's possible nuclear ambitions. If one country were to move forward with nuclear weapons, the other would likely follow. This outcome is far from certain, however. There is some sympathy in both countries to the argument that North Korea views nuclear weapons in defensive terms or as a bargaining chip. Moreover, the nuclear allergy in Japan is still relatively strong and many people in South Korea doubt that the North would ever use nuclear weapons against its own countrymen.

An actual North Korean nuclear test would cause significant damage to the international nonproliferation regime, especially if the repercussions for Pyongyang are minimal. Despite strong statements and economic sanctions initially levied on India and Pakistan following their 1998 nuclear tests, the international community appears to have accepted both countries as *de facto* nuclear weapons states outside the

10 Author's interviews in Seoul and Tokyo, late September-early October 2003.

nonproliferation regime. The United States has improved relations with both countries and no longer complains about their nuclear capabilities. Although relatively few countries confront security challenges similar to those North Korea faces (Iran being the most obvious other example), if North Korea is seen as deriving significant benefits from a nuclear test then barriers to other defections from the nuclear nonproliferation regime will be significantly lowered.

Deployment of operational nuclear weapons. Although a successful nuclear test would demonstrate a nuclear weapons capability, deployment of operational nuclear weapons on delivery systems (ballistic missiles or aircraft) would be regarded as an indicator that North Korea's nuclear arsenal is a potentially usable military capability rather than a political tool. Operational deployment would serve as an overt symbol of Japanese military vulnerability that would be impossible to ignore. This would likely stimulate Japanese efforts to enhance its offensive and defensive military capabilities¹¹. In addition, operationally deployed North Korean nuclear weapons would force the U.S. and South Korean militaries to devote considerable resources and planning to tracking mobile missiles and preparing contingency plans to attack North Korea weapons storage facilities and delivery systems. This significant increase in the militarization of relations is almost certain to spill over into the political and diplomatic spheres, greatly complicating efforts to maintain stable relations or to broker a diplomatic solution to the nuclear crisis. The effects on the international nonproliferation regime would be similar to a nuclear test. If operational deployment of nuclear weapons occurred without being preceded by a nuclear test, the political effects would be significant, but somewhat more muted.

Production of larger quantities of fissile material (or restraints on production capability and potential): The production of larger quantities of fissile material will enhance North Korea's current nuclear weapons capabilities and future nuclear potential. However efforts to

¹¹ Author's interviews with Japanese security analysts in Tokyo, early October 2003.

move beyond a small number (less than ten) weapons are also likely to reshape international perceptions of North Korea's political and military intentions. A major expansion of nuclear weapons capability is likely to be viewed as offensively oriented and would stimulate the military reactions discussed above. Conversely, if the North Korean nuclear weapons program remains capped at a small number of weapons, arguments that it is defensively oriented will be more persuasive. One possibility is that North Korea might be willing to cap its nuclear capability, retaining a small number of nuclear weapons as a deterrent while agreeing to steps that cap its future nuclear weapons potential. This is the essence of what North Korea agreed to in the Agreed Framework. A critical question would be whether such an agreement could be verified. Because the North Korean HEU is more difficult to observe using technical means, North Korea would probably need to make a full declaration of its HEU capabilities, allow inspectors to verify the declaration, and permit some HEU-related equipment and facilities to be destroyed. This kind of an agreement would not remove existing North Korean nuclear weapons, but would cap its future potential. This would be unsatisfactory to many domestic constituencies in the United States and Japan, since it involves accepting a North Korean nuclear weapons capability. It would also cause considerable damage to the nuclear nonproliferation regime. Moreover North Korea is likely to play up its fissile material production potential to increase its leverage during negotiations. For example, efforts to resume construction of the unfinished nuclear reactors or to procure components useful for uranium enrichment are possible. One question is what impact this of an unsatisfactory agreement would have on broader efforts to engage North Korea and influence its future economic and political direction.

Development and production of longer-range ballistic missiles: North Korean efforts to develop longer-range ballistic missiles have continued despite a unilateral flight-test moratorium. In the context of North Korea's nuclear weapons capabilities, longer-range missiles extend the range of North Korea's ability to deliver nuclear weapons.

Some view this as a quest for a more effective deterrent against the United States; others see it as an effort to hold the U.S. homeland at risk in order to blackmail the United States or to enable North Korean offensive options against South Korea. The United States is likely to view these efforts as especially threatening; successful North Korea efforts to develop missiles that can strike the United States may also erode South Korean and Japanese confidence in U.S. security commitments and the U.S. nuclear umbrella. Conversely, North Korea restraint in the development of longer-range missile capabilities could be a deliverable in a negotiated agreement.

Efforts to export fissile material or complete nuclear weapons: North Korea has exported ballistic missiles and missile production technology to a number of countries. There are credible reports that North Korean officials have been involved in counterfeiting and drug smuggling operations. This has led many to fear that North Korea might export fissile material, uranium enrichment technology, or complete nuclear weapons to hostile countries or to terrorist groups. This is a possibility that cannot entirely be ruled out, especially if the regime is faced with impending economic collapse. The United States fears that terrorist groups that acquire nuclear weapons could not be deterred from using them against U.S. civilian or military targets. North Korea's limited stock of fissile material is one constraint on nuclear exports. Providing nuclear weapons or nuclear material to terrorist groups would be an extremely risky step for North Korea to take. The possibility of an undeterrable terrorist group armed with nuclear weapons would likely change the U.S. calculus about the relative risks and benefits of pre-emptive military action against North Korea. (The United States would also be highly likely to retaliate against North Korea in the event that Pyongyang played a role in enabling a nuclear attack on the United States by a terrorist group.) Even if terrorist groups themselves cannot be deterred, it may still be possible to deter countries from transferring fissile material or nuclear weapons to them by holding the countries accountable for their actions.

“Nuclear Firebreaks”

The preceding analysis suggests that there are a number of outcomes that fall short of the desired goal of a Korean peninsula free of nuclear weapons, but that avoid the worst case outcomes in terms of damage to regional security and the continued viability of the nonproliferation regime. Some potential stopping points for North Korean nuclear weapons capability may be sustainable, especially within the context of an inspection regime supported by a negotiated settlement. We now turn to the question of potential policy measures—“nuclear firebreaks”—that might help contain the damage caused by increasing North Korean nuclear capability. These measures can be grouped into three broad categories: measures to roll back North Korean nuclear weapons capability, measures to limit the proliferation impact of North Korean nuclear weapons, and measures to enhance Japanese and South Korean security so that neither country feels the need to develop nuclear weapons:

- 1) Measures to roll back North Korean nuclear weapons capability;
 - * Diplomatic and/or economic sanctions on North Korea
 - * Pre-emptive strikes against North Korean nuclear facilities
 - * Preventive war to remove the North Korean regime
- 2) Measures to limit the proliferation impact of North Korean nuclear weapons
 - * Diplomatic and/or economic sanctions on North Korea
 - * International efforts to interdict possible shipments of nuclear materials
 - * Long-term strategies for returning to a nuclear-free Korean peninsula in the context of Korean reunification.
- 3) Measures to enhance Japanese and South Korean security
 - * Enhanced U.S. security guarantees for South Korea and Japan
 - * Efforts to increase the credibility of the U.S. nuclear umbrella
 - * Deployment of ballistic missile defenses

- * U.S. efforts to improve South Korean and Japanese offensive capabilities

These and other potential strategies need to be identified and studied carefully. At present, policymakers are focused on the short-term issue of how to stop the North Korean nuclear weapons program and are neglecting the potential need to contain the proliferation and regional security consequences of North Korean nuclear weapons. Most of the policy research produced by scholars and think-tanks focuses on stopping the North Korean nuclear program, with speculation about the potential proliferation and regional security consequences of failure mentioned only to highlight the urgency of efforts to address the problem. By seriously examining what the United States and other countries should do if North Korea acquires an overt nuclear weapons capability, this article attempts to fill a gap in the current literature.

III. Measures to Roll Back North Korean Nuclear Weapons Capability

Diplomatic and/or economic sanctions on North Korea: The United States and other countries could use unilateral, multilateral, or United Nations diplomatic or economic sanctions to try to force North Korea to abandon its nuclear weapons program. The United States does not have diplomatic relations with North Korea and already has economic sanctions in place that effectively limit trade and investment. Japan has recently tightened controls on capital flows and technology shipments to North Korea. Much of the current *de facto* sanctions regime against North Korea involves withholding potential benefits (such as Japanese reparations) rather than active efforts to force North Korea to satisfy security concerns. Efforts to sanction North Korea for its withdrawal from the NPT and noncompliance with IAEA inspections have foundered on the unwillingness of South Korea,

China, and Russia to either enact unilateral sanctions or to support a Security Council resolution censuring North Korea. North Korean efforts to increase its nuclear weapons capabilities or to conduct a nuclear weapons test might increase the willingness of China and other Security Council members to adopt sanctions. Although North Korea's economy is hurting, it is unclear whether Pyongyang is anywhere near a breaking point. Moreover the fact that South Korea and China do not want the North Korean regime to collapse limits the potential for sanctions to force North Korea to abandon its nuclear weapons program.

Pre-emptive strikes against North Korean nuclear facilities: Successful pre-emptive strikes against North Korean nuclear facilities would require locating all facilities and fissile material stocks that could be used in a nuclear weapons program, using precision-guided munitions to attack and destroy these targets, and preventing North Korea from retaliating with artillery fire, missile strikes, chemical or biological weapons use, escalation to a full-scale conventional war, or nuclear weapons¹². Most of the facilities involved in North Korea's nuclear weapons program have been identified and located, including the nuclear reactors, fuel fabrication facilities, and reprocessing facilities that constitute the critical parts of the North Korean nuclear infrastructure for producing plutonium¹³. However North Korea's actual plutonium stocks, nuclear weapons, and any uranium enrichment facilities have not been precisely located and therefore cannot be targeted. The United States could use precision aircraft and cruise missile strikes to penetrate North Korean air defenses and attack above-ground nuclear facilities to eliminate North Korea's *future*

12 For a more detailed analysis, see Phillip C. Saunders, *Military Options for Dealing with North Korea's Nuclear Program*, Center for Nonproliferation Studies Web Report, January 27, 2003, [<http://www.cns.miis.edu/research/korea/dprkmil.htm>].

13 For an overview of the North Korean nuclear program, see Dan Pinkston and Stephanie Lieggi, *North Korea's Nuclear Program: Key Concerns*, Center for Nonproliferation Studies, <http://cns.miis.edu/research/korea/keycon.htm>. For details on known and suspected facilities, see the North Korea Nuclear Profile prepared by the Center for Nonproliferation Studies, http://www.nti.org/db/profiles/dprk/nuc/nuc_overview.html.

plutonium production capability. However a pre-emptive attack would not eliminate North Korea's current nuclear weapons capability or fissile material stocks and would be unlikely to destroy any North Korean uranium enrichment capability, which would likely be housed in caves or underground facilities that have not been located. The most difficult aspect of a pre-emptive strike would be preventing or limiting North Korean military retaliation. Seoul is extremely vulnerable to North Korean long-range artillery, and North Korea would also have a wide range of conventional, missile, CBW, and even nuclear responses. Efforts to suppress a North Korean military response through larger military strikes are unlikely to succeed, and the threat of escalation to a full-scale war is more worrisome to U.S. allies than to Pyongyang¹⁴. Given the likely limited results (e.g. only destroying North Korea's *future* plutonium production capability), high risks, and costs in terms of relations with other countries in the region, pre-emptive strikes are an unattractive option.

Preventive war to remove the North Korean regime: The most effective means of rolling back North Korea's nuclear capability would be a preventive war along the lines of the U.S. invasion of Iraq. This would allow the United States to remove the current North Korean regime, destroy North Korean nuclear and WMD facilities, and (hopefully) secure any nuclear weapons or stocks of fissile materials. However the high military and diplomatic costs of invading North Korea make this option impractical. U.S. allies are currently unwilling to support even a limited strike against North Korean nuclear facilities; they would be highly unlikely to support a full-fledged invasion of North Korea. A military campaign would be impossible without access to U.S. bases in Japan and South Korea. The likely casualties, economic damage, and risk of North Korea using nuclear weapons would make a major war in Korea extremely costly. The U.S. military

¹⁴ Even though Pyongyang would not enjoy escalation dominance in the classical sense, South Korean and Japanese fears of a wider war would likely allow Pyongyang to retaliate militarily without worrying excessively about escalation to a full-scale conflict.

is also currently bogged down in Iraq, limiting the ability of the United States to launch a major military campaign. Strong opposition from UN Security Council members to the invasion of Iraq suggests that a U.S. decision to launch a second preventive war might stimulate major shifts in great power relations as countries began to balance against U.S. power. For these reasons, a preventive war to roll back North Korean nuclear capability is highly unlikely.

IV. Measures to Limit the Proliferation Impact of North Korean Nuclear Weapons

Diplomatic and/or economic sanctions on North Korea: North Korea efforts to improve or clarify its nuclear weapons capabilities could make countries more willing to impose unilateral, multilateral, or UN diplomatic or economic sanctions. The primary objective of nonproliferation sanctions would be political: to make North Korea pay a price for its defection from the nuclear nonproliferation regime in order to deter other countries such as Iran that may be reconsidering their nonproliferation obligations. However the threat of sanctions might also be useful in limiting the pace of improvements in the North Korean nuclear weapons program. Countries such as South Korea, China, and Russia have been reluctant to pressure North Korea, but this might change if the North Korean nuclear program moves ahead rapidly (and especially if North Korea conducts a nuclear test). Although the sanctions that these countries would be willing to apply are unlikely to force North Korea to abandon its nuclear weapons program, they might achieve the more limited objective of slowing or constraining North Korea's program. They could also have a positive impact in shoring up the nonproliferation regime.

International efforts to interdict possible shipments of nuclear materials: Enhanced nonproliferation and interdiction efforts could also potentially play a useful role in limiting North Korea's ability to import technologies and components needed for uranium enrichment.¹⁵ The

United States has already launched the Proliferation Security Initiative (PSI) to strengthen and coordinate international efforts to interdict illegal shipments of nuclear materials. The PSI is also viewed as a means of increasing international pressure on North Korea. Yet as the abortive effort to intercept a North Korean shipment of missiles to Yemen prior to the Iraq war indicated, the legal basis for international interdiction efforts is questionable.¹⁶ Moreover, it will be difficult to obtain sufficiently precise intelligence to respond to the most serious threat—shipment of relatively small quantities of fissile material or nuclear weapons to terrorist groups. Nevertheless, these efforts may make shipments of missile technology or nuclear material more difficult, and could provide a basis for emergency interdiction efforts if intelligence is available. One positive side effect is that international efforts to provide a legal basis for interdiction arguably strengthen international nonproliferation norms.

Long-term strategies for returning to a nuclear-free Korean peninsula in the context of Korean reunification: Even if diplomatic efforts to return to a Korean peninsula free of nuclear weapons do not succeed, the United States and other Northeast Asian countries should not accept North Korean nuclear weapons capability as a permanent state of affairs. North Korea's nuclear weapons capability should be treated as a temporary anomaly that will eventually be removed. At a symbolic level, this means not allowing North Korea to enter the NPT as a nuclear weapons state and requiring all IAEA and NPT member-states to cease any nuclear trade with Pyongyang. This could also involve IAEA contingency planning for how to eventually destroy North Korean nuclear weapons and weapons-grade fissile material stocks and verify that all nuclear weapons capabilities are removed. It should also involve a political commitment from South Korea that a

15 Recent statements that China will inspect aircraft making refueling stops in Chinese territory for weapons of mass destruction and dangerous goods suggest that North Korea may no longer be able to import uranium enrichment technology from Pakistan via C-130 flights.

16 See Mark J. Valencia, "Pressing for Sea Change," *Washington Times*, 24 August 2003. [www.washtimes.com/world/2003-824-110935-3502r.htm].

reunified Korea will not possess nuclear weapons and that the reunification process would include international efforts to dismantle the North's nuclear facilities and fully account for all fissile material. (Similar political commitments and planning should also be initiated for North Korea's chemical and biological weapons capabilities). Efforts not to treat North Korean nuclear weapons as a permanent feature of the Northeast Asian security environment could have a positive impact on both regional security and on the international nonproliferation regime.

V. Measures to Enhance Japanese and South Korean Security

Enhanced U.S. security guarantees for South Korea and Japan: Increasing North Korean nuclear capability is likely to heighten security concerns in South Korea and Japan. This could weaken U.S. security alliances and lead both countries to improve their conventional military capabilities, seek a more independent security role, and reconsider their nuclear options. Measures to enhance Japanese and South Korean security would make both countries less likely to pursue nuclear weapons. Measures to improve alliance relations and enhance security guarantees could include additional deployments of U.S. offensive forces to the region to enhance deterrence. Although the planned redeployment of the U.S. 2nd infantry division away from the DMZ makes sense in terms of operational flexibility and reducing the political footprint of the U.S. military presence in South Korea, the manner in which this is being carried out has unnecessarily heightened tensions in bilateral relations. Military deployments and joint exercises could help enhance the visibility of alliance relations in ways that reassure South Korea and Japan. Symbolic measures that illustrate the political commitment of both sides to the alliance are another possible means. These might include high-level visits, public activities by nongovernmental groups, and academic conferences focused on the role of the alliances in handling the North Korean nuclear crisis.

Efforts to increase the credibility of the U.S. nuclear umbrella: Although the health of U.S. security alliances with South Korea and Japan is important, the threat posed by increasing North Korean nuclear capabilities poses specific questions about the credibility of the U.S. nuclear umbrella. Some Japanese security analysts (such as Masashi Nishihara) have raised concerns that a U.S. security guarantee for North Korea could erode the U.S. nuclear umbrella and potentially leave Japan vulnerable to North Korean nuclear missiles.¹⁷ These concerns deserve serious attention. A number of steps are possible to enhance the credibility of the U.S. nuclear umbrella. These might include official or unofficial statements about how the allies would respond to North Korean nuclear threats or about the circumstances under which nuclear weapons might be used. Given Japanese and South Korea sensitivities on this issue, some of these efforts might be conducted in academic fora or make use of deliberate leaks to the press. These measures might be reinforced by contingency plans or actual deployments of nuclear capable delivery systems such as strategic bombers or stealth fighters. More detailed (and somewhat more public) planning efforts could increase the credibility of the U.S. nuclear umbrella in South Korea, Japan, and North Korea. These measures would likely have a negative political impact on relations with North Korea, but that could be an advantage if information about pending military measures is released at politically opportune times.

Deployment of ballistic missile defenses: Ballistic missile defense systems such as the PAC-3 and the Naval midcourse interceptor systems may also have a role in helping South Korea and Japan deal with increasing North Korean nuclear capability. BMD systems would potentially reduce the vulnerability of both countries to North Korean nuclear threats, enhance their willingness to fulfill alliance commitments in a crisis, complicate North Korean military planning, and reduce the damage if North Korea did launch an attack with conventional or nuclear-armed ballistic missiles. As Israel's experience with the Patriot

17 Masashi Nishihara, "North Korea's Trojan Horse," *Washington Post*, 14 August 2003.

system in the 1991 Gulf War demonstrated, BMD systems may not need to be very effective from a military perspective in order to have some positive political effects. Japan is moving forward with efforts to acquire the PAC-3 system, and is also continuing joint research with the United States on naval BMD systems that might be deployed on Japanese ships. South Korea has been less interested in BMD, although U.S.-operated PAC-3 systems have recently been deployed with U.S. forces based in South Korea. Missile defenses would not be effective against a concerted North Korean attack (and would provide no protection against artillery attacks against Seoul), but they could have some political and military value. BMD deployments might reduce pressures to develop nuclear weapons, but South Korea and Japan are unlikely to be satisfied with purely defensive responses to increasing North Korean nuclear capabilities. If North Korean nuclear capabilities increase significantly, South Korean and Japanese interest in conventional offensive capabilities is likely to increase in response.

Efforts to improve South Korean and Japanese conventional offensive capabilities: The previous measures emphasize efforts to strengthen U.S. security cooperation with South Korea and Japan. However if these efforts do not assuage concerns about the credibility and reliability of U.S. security commitments, an alternate measure would be for the United States to help South Korea and Japan develop more capable offensive conventional forces that would give them an independent ability to strike North Korea. This might address fears of "decoupling" of the security interests of the United States and its allies. This is a second best solution in many ways, because it is likely to increase the militarization of the conflict and impede efforts to improve economic and political relations between North Korea and its neighbors. China will also object to U.S. efforts to help Japan develop more capable offensive military forces. However if South Korea and Japan view the measures discussed above as insufficient to meet their security needs, development of conventional offensive capabilities would be preferable to the development of nuclear weapons. The United States and South Korea have already signed an agreement

allowing South Korea to develop ballistic missiles with capabilities just below the MTCR limit of a 500 kg payload delivered to a 300 km range. Japan would likely seek to acquire aircraft and precision-guided munitions that would give it a precision strike capability. Since Japanese military officials are interested in developing a pre-emptive strike capability to respond to an imminent North Korean missile attack, Japan would likely also seek access to U.S. near-real time intelligence sources or its own independent intelligence assets to complement its reconnaissance satellite capabilities. Enhancing South Korean and Japanese offensive strike capabilities would have some negative side effects, including allowing both countries a more independent security role, potentially calling U.S. nonproliferation commitments into question, and stimulating negative reactions from other countries in Asia. However if these actions are necessary to forestall South Korea and Japan from developing nuclear weapons of their own, these costs may be worth paying.

VI. Conclusion

North Korea's increasing nuclear weapons capability poses a profound threat to Northeast Asian security and to the viability of the nuclear nonproliferation regime. The United States and countries in Northeast Asia have properly focused on the goal of securing a nuclear weapons-free Korean peninsula. The six party talks in Beijing have created a degree of diplomatic momentum, but the obstacles to a diplomatic agreement that resolves the issue and achieves a Korean peninsula free of nuclear weapons remain formidable. North Korea's current degree of nuclear capability has already had a negative impact on Northeast Asian security and on the nonproliferation regime, but there are potential outcomes that are even worse. There is a clear need to think about the consequences of increasing North Korean nuclear capability and to examine policy measures that might contain the damage. This is particularly true because North Korea negotiating tactics and nuclear brinkmanship have interacted with the U.S.

determination not to reward North Korea bad behavior to produce a crisis that continues to escalate. The United States has organized international pressure against North Korea, but North Korea has nevertheless continued to increase its current nuclear weapons capability and future nuclear weapons potential. Efforts to reach a diplomatic solution of the North Korea nuclear crisis must continue, but there is also a clear need to consider what the United States and other countries in Northeast Asia should do if those efforts fail.

This article offers a first cut at defining the problem and outlining some potentially useful policy approaches. Unfortunately, the policy options available to roll back North Korean nuclear weapons capabilities either appear unlikely to succeed or involve costs that the United States and its allies are unwilling to pay. Unless North Korea is already close to the breaking point—which is impossible to assess from the outside—the United States and its allies may have to deal with a nuclear North Korea for some time to come. This makes it even more important to consider ways to limit the proliferation impact of North Korean nuclear weapons and to enhance Japanese and South Korean security so that neither country feels the need to develop nuclear weapons. A range of potential responses are discussed above. One concern is that some of the more assertive responses (such as the use of sanctions, interdiction, and enhanced military cooperation between the United States and its allies) would undercut the diplomatic strategies that South Korea and China are currently pursuing. They are also likely to have negative side effects on other countries in the region and may further militarize the crisis in ways that impede a diplomatic settlement in the future. These costs would have to be weighed carefully in deciding which options to pursue and how to implement them. The United States would need to consult closely with its allies and other countries in the region in order to decide which measures are appropriate given the circumstances. Nevertheless, it is important to develop and evaluate policy options in case a negotiated settlement of the crisis is not reached (or in case North Korea retains a residual or ambiguous nuclear weapons capability). This article is a first step in this process.