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Understanding the North Korean Nuclear Threat

As the 2015 Nuclear Nonproliferation Treaty (NPT) Review Conference continues in New York, the international community's failure to halt the spread of nuclear weapons to North Korea looms large. Unlike the four of the world's nine nuclear-weapon states that have shown some progress in reducing their nuclear arsenals, North Korea is working hard to expand its arsenal and make it more credible. Unlike six of the nine, which have either ratified the 1996 Comprehensive Test Ban Treaty or maintained a testing moratorium since the treaty was concluded, North Korea has conducted three underground nuclear tests, the only state to do so during the last 17 years. Unlike the three nuclear-weapon states that never became parties to the NPT, North Korea signed the treaty, declared it was withdrawing, later pledged to denuclearize, and then reneged on its commitment. Pyongyang's nuclear policies have been damaging to the treaty and international stability. In seeking to address this grim reality, an objective assessment of North Korea's actual nuclear capabilities is especially important.

HIGHLIGHTS

- In spite of North Korea's accession to the NPT in 1985, agreement with the United States in 1994 to freeze its plutonium weapons program in exchange for aid, and the six-party agreement in 2005 to abandon all nuclear weapons efforts, the North's nuclear program today is out of control and accelerating.
 - North Korea has produced sufficient plutonium for at least six to eight nuclear weapons, is enriching uranium to weapons grade, and has conducted three underground nuclear test explosions.
 - It has deployed some 1,000 short- and medium-range ballistic missiles, hundreds of which may be capable of carrying a nuclear warhead.
 - It successfully placed a satellite in orbit in 2012, using a rocket, which would be technologically relevant to an intercontinental ballistic missile development effort.
- Foreign contacts with North Korea are very limited, and no

International Atomic Energy Agency inspectors are present to monitor the country's nuclear activities. There is consequently a significant degree of uncertainty about the North's nuclear and missile status.

- U.S. experts estimate that North Korea has enough fissile material for 10 to-16 nuclear weapons; China's estimate is reportedly 20.
- North Korea may currently pose a limited nuclear missile threat to its nearest neighbors, but the pace of its long-range missile development has been consistently overestimated. A credible North Korean nuclear missile threat to the U.S. mainland appears to be years away.
- The Obama administration's "strategic patience" approach is not working. Washington and Beijing must step up their efforts to revive the six-party process with the near-term goal of freezing Pyongyang's nuclear and missile programs, taking care to manage potential spoilers, Russia and the U.S. Congress.

Background

The three-year war precipitated by North Korea's June 1950 invasion of South Korea never officially ended with a peace treaty. Although the 1953 armistice halted active fighting, the North's relationship with South Korea and the United States has remained hostile, still largely frozen in time, notwithstanding occasional periods of thawing. Moreover, it has sometimes flared into deadly military confrontations that have prompted explicit threats of war.

North Korea's nuclear program originated with technical assistance provided by the Soviet Union in the 1950s and accelerated with extensive Soviet assistance in the construction of the Yongbyon Nuclear Research Center and IRT-2000 nuclear research reactor in the 1960s. Although North Korea received Soviet and limited Chinese help early on, North Korea's nuclear program has advanced largely without significant foreign assistance.¹ The North's nuclear infrastructure expanded significantly in the early 1980s with construction of uranium-milling

facilities, a fuel rod fabrication complex, and a five-megawatt (electric) nuclear reactor at Yongbyon. At this time, North Korean scientists and engineers began experimenting with the high-explosive testing related to nuclear bomb designs.

North Korea has long been a key challenge for the global nuclear nonproliferation regime. The United States and the international community has tried for many years to prevent North Korea's development of nuclear weapons and delivery vehicles and its foreign sales of nuclear technology and ballistic missiles.

North Korea's 1985 accession to the nuclear Nonproliferation Treaty (NPT), under which it forswore the development and acquisition of nuclear weapons, was an important milestone, but every step of tentative progress since then was soon followed by setbacks and stalemates. Not long after Pyongyang agreed with Seoul in 1991 not to "test, manufacture, produce, receive, possess, store, deploy or use nuclear weapons" or to "possess



KNS/AP/Getty Images

This picture captures North Korea's only successful satellite launch on December 12, 2012, from the Sohae Satellite Launching Station on the country's west coast. Many consider the Unha-3 rocket used in the launch as a prototype for a militarized version, often referred to as a Taepo Dong-2 ICBM, but this large, liquid-fueled space launch vehicle is not optimized for military use. Additional development and flight-testing would be needed before it could be converted into an ICBM.

nuclear reprocessing and uranium enrichment facilities,” it ran into challenges from the International Atomic Energy Agency (IAEA) on discrepancies in the information it had provided to the agency. Subsequent IAEA requests for special inspections were rejected, and at the end of 1993, North Korea announced its intention to withdraw from the NPT.

The United States has pursued a variety of policy responses to the proliferation challenges posed by North Korea, including establishing close military cooperation with U.S. allies in the region; forming a negotiating coalition with China, Japan, Russia, and South Korea in the six-party talks process; and using sanctions and export controls as leverage unilaterally and through multilateral institutions. During the last two decades, the United States engaged in two major diplomatic initiatives seeking North Korea’s agreement to abandon its nuclear weapons efforts in return for aid.

In October 1994, the United States appeared to have averted North Korea’s withdrawal from the NPT through negotiation of the Agreed Framework. Under this agreement, Pyongyang committed to freezing its illicit plutonium weapons program in exchange for aid. The Yongbyon reactor was shut down. Plutonium contained in the reactor’s spent fuel was isolated and monitored by the IAEA. By the fall of 2002, however, the agreement had collapsed, and North Korea once again began operating its nuclear facilities and resumed reprocessing of weapons-grade plutonium.

The second major diplomatic effort was the six-party talks initiated in August 2003. In 2005, between periods of stalemate and crisis, those talks appeared to arrive at a critical breakthrough. North Korea pledged to abandon “all nuclear weapons and existing nuclear programs” and return to the NPT. In 2007 the parties agreed on a series of steps to implement that 2005 agreement.

Those talks broke down in 2009 following disagreements over verification and an internationally condemned rocket launch by North Korea. Pyongyang has since stated that it would never return to the talks and is no longer bound by previous agreements.

The five other parties state that they remain committed to the talks and have called for Pyongyang to recommit to its 2005 denuclearization pledge. North Korea insists that it should be treated like a nuclear-weapon state. Recent reports suggest that discreet talks may be underway to secure a pledge from Pyongyang to freeze current production of nuclear material without the five countries demanding in advance that it forswear possession of nuclear weapons.²

Table 1: North Korean Nuclear Weapons: Uncertainty Abounds

Year	Warheads/Bombs deployed on	Delivery Vehicles
2015	10-16	Scud SRBMs
		No Dong-2 MRBMs
		Taepo Dong 2 ICBMs*
		IL28 Light Bombers
2020	20-100 (Alternative Growth Paths) Minimal: 20	Scud SRBMs
		No Dong-2 MRBMs
		Musudan IRBMs*
		Taepo Dong-2 ICBMs*
		IL28 Light Bombers
	Moderate: 50 (Most Likely)	Scud SRBMs
		No Dong-2 MRBMs
		Musudan IRBMs
		Taepo Dong-2 ICBMs
		KN-08 ICBMs*
		SLBMs*
Rapid: 100	IL28 Light Bombers	
	KN-02 SRBMs	
	Scud SRBMs	
	No Dong-2 MRBMs	
	Musudan IRBMs	
	KN-08 ICBMs	
	SLBMs	
	IL28 Light Bombers	

Source: Joel S. Wit and David Albright, “The Last Word,” 38 North blog, March 19, 2015 <http://38north.org/2015/03/witalbright031915/>.

*The Wit-Albright analysis designates these systems as capable of being used in an “emergency operational” basis, albeit with low reliability. (As stated in the text, the author believes that a system, which has never been flight-tested in a ballistic missile weapon mode cannot be considered operational.)

Intelligence Challenges Regarding North Korean Nuclear and Missile Programs

Making accurate political and technical forecasts concerning North Korea has proven to be extremely challenging. The actions of North Korea’s leaders often appear erratic to those who do not follow the arcane politics and history of the ruling Kim dynasty. Moreover, the weapons development track in North Korea sometimes deviates from the course of development elsewhere. Given the lack of U.S. diplomatic, commercial, and cultural contact with North Korea, the hermetically sealed nature of North Korean society, and the concentration

of decision-making authority at the top of the North's dictatorial regime, continuing surprises from the government in Pyongyang should be expected.

An assessment of North Korea's nuclear capabilities starts with some solid information: the amount of plutonium-239 known to have been extracted from the spent fuel of the Yongbyon reactor and reprocessed. Based on this knowledge, experts initially estimated that North Korea had sufficient fissile material for a handful of weapons using a rudimentary nuclear warhead design.

Over time, additional variables were added to the equation, including the unknown amount of enriched uranium from recently revealed centrifuges at Yongbyon and possibly from other, covert facilities and the unknown sophistication of North Korean warhead designs, which would affect the amount of fissile material needed for each weapon.

On some key questions, the U.S. intelligence community has been frank in describing the limits of its understanding. For example, Director of National Intelligence James Clapper conceded in this year's worldwide threat assessment statement to Congress that "we do not know the details of Pyongyang's nuclear doctrine or employment concepts."³

In other areas, however, the intelligence community has been less forthcoming about its lack of information and certainty, offering only predictions of what "could" happen rather than what is most likely to happen. Such formulations provide ample protection to the analysts against future accusations that they had provided no warning, but inevitably lead to misleading contemporaneous headlines in the press and erroneous interpretations by members of Congress.

Open disagreements in characterizing the status of North Korea's long-range missile program among senior U.S. officials and between U.S. and South Korean officials is revelatory. They could indicate either honest differences in assessing the meaning of commonly shared information or the differing purposes of the intelligence assessment. Warning of what could happen uses different assumptions than predicting what is likely to happen; each has a legitimate role.

Some U.S. military commanders have stated confidently that North Korea has been able to design miniaturized warheads that can be placed on medium- and short-range missiles. For example, Gen. Curtis Scaparrotti, the top U.S. military commander in South Korea, said at a Pentagon news conference in October 2014, "I believe that [the North Koreans] have the capability to have miniaturized the [nuclear] device at this point."⁴

A Defense Intelligence Agency report in 2013 had assessed with "moderate confidence" that the North had already mastered the technology of building a device small enough to be used in a missile warhead.⁵ Such statements have been challenged by South Korean intelligence officials or walked back by the leadership of the U.S. intelligence community and senior Pentagon officials.

There is, in fact, a significant difference of opinion among experts in what Jeffrey Lewis, the director of the East Asia Nonproliferation Program at the James Martin Center for Nonproliferation Studies, calls "The Great Miniaturization Debate." Lewis explains that determining whether North Korea can arm a ballistic missile with a nuclear warhead boils down to an assessment of three questions:

- Can it make a nuclear weapon small enough?
- Can a compact nuclear weapon survive the shock, vibration, and temperature change of ballistic missile flight?
- Can the re-entry vehicle survive the heat of re-entry?

His answer to each is "yeah, probably," but he concedes that "reasonable people may disagree."⁶ Until an actual flight test occurs and perhaps even afterward, the confidence level in such assessments will not be high.

In recent months, nongovernmental analysts have described an increasingly alarming situation with regard to North Korea's nuclear status, particularly concerning the numbers of nuclear warheads that North Korea may be able to deploy. A prominent analysis by Joel Wit and Sun Young Ahn of the US-Korea Institute at SAIS laid out scenarios for minimal, moderate, and rapid growth in North Korea's nuclear forces (see Table 1). From an existing estimated stockpile of 10 to 16 nuclear weapons (six to eight fashioned from plutonium) capable of being deployed on short- and medium-range ballistic missiles, the authors project growth by 2020 to 20, 50, or 100 warheads, with the latter two paths including nuclear-tipped intermediate-range ballistic missiles and intercontinental ballistic missiles (ICBMs).⁷

Although Wit and Ahn assessed that the moderate path was the most likely, most press coverage of their report headlined the high-end projection—100 warheads deployed on a full range of battlefield, theater, and intercontinental weapons, with the longer-range systems carrying a significantly higher yield than the North currently has in its inventory.

Recent news reports suggested that Chinese estimates



Ed Jones/AFP/Getty Images

A North Korean KN-08 road-mobile ICBM is paraded in Pyongyang on July 27, 2013. This system has never been flight-tested.

already credit North Korea with 20 nuclear warheads and sufficient weapons-grade uranium-enrichment capacity for doubling the size of its arsenal by next year⁸—a pace of progress more in line with the rapid-growth scenario in the Wit and Ahn analysis than the majority view among U.S. security experts. The closed-door discussions with U.S. nuclear specialists in February 2015 were reported to include Chinese technical, political, and diplomatic experts on North Korea’s nuclear program, as well as military representatives. Although more-detailed information is needed to reach definitive conclusions about whether such assessments reflect the official views of the Chinese government, the higher number cited is at least intriguing and more noteworthy coming from China’s “reluctant witness” perspective.

Siegfried Hecker, who was the U.S. team’s lead expert during the February conversations, acknowledged that estimates of North Korea’s nuclear stockpile by China and the United States involved a great deal of guesswork. Additional evidence of the softness in threat assessments regarding North Korea can be seen in the frequently cryptic or confusing references to North Korean capabilities in unclassified statements of the U.S. intelligence community.

For example, Clapper straddled the ICBM deployment timing issue in congressional testimony by explaining

that “[w]e assess that North Korea has already taken initial steps toward fielding [the KN-08 ICBM], although the system has not been flight-tested.” He thereby left the impression, at least among non-experts, that a system that has never flown is already being fielded, even though experts realize that, in all other historical examples of ICBM development, operational status would only be achieved years after the system’s first research and development flight test.

Some argue in response to such logic that North Korean weapons development timelines are *sui generis*, noting, for example, that the Nodong medium-range ballistic missile was deployed after only one successful flight test. The weight of evidence, however, appears to be on the side of those who are dubious about the operational capability of North Korea’s road-mobile KN-08 ICBM.⁹

A prestigious U.S. commission headed by former Defense Secretary Donald Rumsfeld assessed in 1998 that North Korea (and other states of proliferation concern) would be able to threaten the United States with an ICBM within five years – that is, by 2003. More than a dozen years have come and gone since then with no North Korean flight-test of an ICBM. Although the 1999 National Intelligence Estimate (NIE) on the foreign ballistic missile threat was more careful in its predictions than the Rumsfeld Commission, it judged as “most likely” that the United

States would face a North Korean ICBM threat by 2015.¹⁰

North Korea's recent announcement that it had successfully test-fired a ballistic missile from a submerged submarine¹¹ will add new concerns about the nuclear threat the country poses. If confirmed, political reactions in the region and in the United States are likely to prove more dramatic than any actual military gains by North Korea would warrant.

indicated.

Yet overestimation and misrepresentation of nuclear and missile threats can have a fateful impact on policy decisions. Responding to threats that do not exist as if they did can lead to high opportunity costs, such as misallocating defense resources, provoking potential enemies, or even invading countries unnecessarily. Predicting the imminent appearance of "rogue state"

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How Intelligence Works: When in Doubt, Overestimate

Early estimates by U.S. military intelligence agencies of North Korean nuclear warhead numbers were based on calculations of how many unsophisticated warheads could be made from known quantities of available plutonium. Over time, the number of projected warheads increased without increases in the plutonium stockpile under the assumption that North Korea would make progress over time in shrinking warhead size. This assumption may have been reasonable, but it was not necessarily based on direct evidence.

For military intelligence analysts, it may be prudent practice to consider worst-case scenarios and to err on the side of overestimation because the consequences of underestimating the enemy in war can be catastrophic. Ever since Pearl Harbor and the invasion of South Korea, this model has dominated U.S. intelligence projections. Until the 2003 invasion of Iraq revealed that Baghdad's weapons of mass destruction capabilities had been dramatically exaggerated, at least in public versions of classified intelligence assessments, severe bureaucratic and political penalties were limited to underestimation rather than overestimation of threats.

Overestimations have rarely resulted in penalties for the analysts and politicians responsible. For example, Congress established no "Team Bs" in learning that the missile and bomber gaps of the early 1960s between Soviet and U.S. strategic forces were non-existent. The public learned only years later that the official version of the 1964 Tonkin Gulf attack was both erroneous and incomplete. Only after the Cold War ended did the public discover that Soviet anti-ballistic missile capabilities were much less significant than contemporary assessments

ICBMs, used to justify U.S. withdrawal from the ABM Treaty, and depicting Saddam's WMD programs as active, used to justify invading Iraq, provide cases in point.

Many congressional supporters of the seminal National Missile Defense Act of 1999, which provided an important milestone on the road to U.S. withdrawal from the ABM Treaty,¹² cited the Rumsfeld Commission findings and the 1999 NIE projections in justifying their votes.

Moreover, the 2002 decision of President George W. Bush to rush deployment of the first flawed strategic missile defense interceptors into an inadequately tested silo design by the fall of 2004 similarly was justified largely on the basis of the "imminent" threat allegedly posed by North Korean ICBMs. Much of the \$40 billion spent since then, including the \$500 million cost of replacing the first six defective silos in Alaska, and the technological dead ends subsequently encountered are explained by the suspension of normal Department of Defense procedures for weapons development and procurement in order to speed system deployment.¹³

Therefore, the default setting for the Central Intelligence Agency and other civilian intelligence entities that serve the nation's political leaders and the wider public should not be "worst case." The ideal formula for threat assessments by the director of national intelligence is to provide a range of possibilities and the confidence levels behind each judgment, including a designation of the alternative future considered most likely.

A Realistic Assessment of the North Korean Threat

The root cause of the threat posed by North Korea is political and geographical. With or without nuclear weapons, North Korea poses a grave military threat to its

southern neighbor. The North has a large military heavily deployed close to the demilitarized zone separating the two counties, and it has around 1,000 missiles and thousands more artillery tubes and artillery rockets within range of the 26 million people living in Seoul. It also maintains a belligerent posture toward the South, regarding itself as under threat and in a continuing state of war.

North Korea has or soon will have small numbers of nuclear warheads on medium-range Nodong ballistic missiles capable of targeting cities in Japan and throughout South Korea. However vulnerable, unreliable, or inaccurate these missiles may be, their potential as nuclear weapons delivery vehicles will not be lightly dismissed by governments in Seoul, Tokyo, and Washington. Security officials in these governments will take into consideration that any military confrontations with North Korea could conceivably lead to nuclear devastation.

If current trend lines continue, North Korea will probably be able to pose a genuine nuclear threat to the U.S. mainland within a decade. Pyongyang's primary motivation for developing such a capability would be to deter aggression against North Korea rather than to facilitate its own aggression against others. The regime's principal inhibition in the use of nuclear weapons will be not the extent and quality of missile defenses arrayed against it, but the sure knowledge that nuclear use would lead to the end of the Kim dynasty and the North Korean state.

The Logical Policy Response to the North Korean Threat

Even when projections of North Korea's nuclear capabilities in the decade ahead are scaled back to a realistic level from the chimeras commonly used to promote political agendas, they will pose a daunting challenge for U.S. defense policy and the international community's nonproliferation and disarmament agendas.

The Obama administration's "strategic patience" policy may have avoided precipitating an apocalypse thus far, but it has not succeeded in freezing or reversing North Korea's nuclear trajectory. The six powers may now be inching toward a resumption of negotiations, but much more effort and diplomatic flexibility need to be employed. The six capitals could take inspiration from the emerging multilateral agreement with Tehran on Iran's nuclear program and could benefit as well from taking a close look at opportunities missed with North Korea in the past.¹⁴ Decades of distrust and enmity between negotiating

partners are not insurmountable obstacles to finding an overlap in national interests.

First and foremost, it will be up to China and the United States to change the dynamics of the six-party process. As North Korea's most important economic and military ally, China must do more to apply pressure on the government in Pyongyang, demonstrating that Beijing's policy of a nuclear-free Korean peninsula is enduring and that the unanimous resolutions of the UN Security Council must be respected. For its part, the United States should be less cautious and abstemious in offering economic and energy help to the North and more ready to extend diplomatic recognition. Without abandoning its long-term goal of denuclearizing the Korean peninsula, Washington needs to recognize the value of settling for a half loaf in the near term, freezing if not reversing North Korea's nuclear and long-range missile programs.¹⁵

The potential spoilers in a fruitful process to engage Pyongyang are not South Korea and Japan, both of which have strong reasons to support U.S. initiatives in the six-party talks, but Russia and the U.S. Congress. Moscow must be encouraged to emulate the generally constructive role it has adopted in the negotiations with Iran, with Washington exhibiting due regard for ensuring that Russia obtains economic and security benefits from a negotiated outcome. The Obama administration needs to be more proactive with Congress to secure buy-in from key members for the substantive compromises that need to be made with Pyongyang and avoid the kind of interference that has come close to derailing successful completion of the Iran talks.

ENDNOTES

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