

North Korea's Development of a Nuclear Weapons Strategy

JOSEPH S. BERMUDEZ JR.

AUGUST 2015



NORTH KOREA'S
NUCLEAR FUTURES SERIES

US-KOREA INSTITUTE AT SAIS

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This publication results from research supported by the Naval Postgraduate School's Project on Advanced Systems and Concepts for Countering Weapons of Mass Destruction (PASCC) via Assistance Grant/Agreement No. N00244-14-1-0024 awarded by the NAVSUP Fleet Logistics Center San Diego (NAVSUP FLC San Diego). The views expressed in written materials or publications, and/or made by speakers, moderators, and presenters, do not necessarily reflect the official policies of the Naval Postgraduate School nor does mention of trade names, commercial practices, or organizations imply endorsement by the US Government.

This North Korea's Nuclear Futures Series was also made possible by support from the John D. and Catherine T. MacArthur Foundation.

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NORTH KOREA'S DEVELOPMENT OF A NUCLEAR WEAPONS STRATEGY

Introduction

For almost six decades, the Democratic People's Republic of Korea (DPRK or North Korea) has pursued a nuclear program that has gradually developed in size, complexity and capabilities from a small scientific research effort into a comprehensive effort to produce nuclear weapons. At present, North Korea is estimated to possess an inventory of 10-16 nuclear weapons that could rapidly expand by 2020. As this nuclear program has evolved, the North Korean leadership and the Korean People's Army (KPA) have also gradually developed a nuclear strategy for deterrence that appears to have progressed from viewing these weapons as primarily political tools to deter an attack from the United States to operational strategic defensive weapons to inflict unacceptable losses upon attacking forces and assured retaliation, and possibly today, into viewing nuclear weapons as both strategic political weapons and for use in a range of strategic, operational and "battlefield" (i.e., tactical) situations during wartime.

This evolving nuclear weapons strategy has implications for the United States, the Republic of Korea (South Korea), China, and Japan. Up until now, North Korea has been deterred by a complex set of political and military factors. Among these are US security commitments and the presence of US military forces in South Korea and Japan, the strength and capabilities of the South Korean government and armed forces, and the desires of both China and Russia to maintain the status quo in the region. However, the combination of a growing nuclear weapons inventory, a developing ballistic missile force and a nuclear strategy that may be evolving into including options for limited use of these weapons, combined with a new, young and inexperienced leader, could heighten the fears that US extended deterrence will erode and increase the likelihood of greater instability in the region.

North Korean Thinking about Nuclear Strategy (1950-2014)

At the outset, a brief caveat is in order regarding the analysis of North Korea in general and its nuclear weapons program and strategy specifically. Any research looking into these issues is faced with numerous imponderables owing in large measure to the closed and highly centralized nature of the North Korean political system; the nation's strategic, operational and tactical efforts at camouflage, concealment and deception; and the resulting absence of specific, reliable unclassified information. Hence, this discourse relies to a considerable extent on inferential evidence gleaned through prolonged study of North Korea's national security strategy and takes an overarching holistic view.

With those caveats in mind, it is clear that the development of a nuclear weapons strategy in North Korea has occurred within an environment that is based upon a set of overriding strategic principles that inform and influence all aspects of life within the nation, especially political decision making. These principles are: 1) the survival and continued leadership of the Kim family dynasty; 2) deterrence of the United States and its allies; 3) elimination of internal threats; 4) economic development of the nation; and 5) reunification of the Fatherland. Within that context, the evolution of North Korean thinking about the role of nuclear weapons in its defense strategy has taken place in roughly six periods. While these periods are not hard and fast, they present a logical means by which to understand this complicated issue.

Fatherland Liberation War and Reconstruction (1950-1960)

While Kim Il Sung and the North Korean leadership were probably already aware of the bombing of Hiroshima and Nagasaki with the atomic “doomsday” weapon, in part through stories told by returning Koreans who survived the attack, the belief in the assured destructiveness of nuclear weapons and the lack of defense against them was significantly reinforced by US threats to employ these weapons to end the Korean War. These threats had the desired effect—an Armistice Agreement was reached—as well as a truly profound impact on the North Korean leadership’s thinking that cannot be overstated. The danger that US nuclear weapons might be used against the North has been a central principle in its strategic thought and actions ever since.

The nuclear threat resulted in practical steps. First, even before the signing of the Armistice Agreement the KPA began to address what was then called “ABC” (atomic, biological and chemical) weapons by reestablishing chemical defense units. These units were responsible for defensive preparations against a nuclear attack. During the immediate post-war years the KPA initiated a series of national level “Atomic Warfare” defensive exercises and subsequently established an “Atomic Weapons Training Center” near Kilchu to train division-sized units to conduct conventional operations (offensive and defensive) on an “atomic” battlefield.

Second, Pyongyang began to lay the groundwork for the development of its own rudimentary nuclear scientific infrastructure. The Academy of Sciences expanded a program begun before the war that sent promising individuals to the Soviet Union to be trained as scientists and technicians in related fields. Some of these individuals would subsequently come back and play crucial roles in the North’s nascent nuclear program. By the end of the war, the North had established a basic “atomic” research program at Hungnam. During the late 1950s, several nuclear cooperation agreements were signed with the Soviet Union and related curricula were established at Kim Il Sung University and Kim Chaek College of Science and Technology. Funds for these activities were allocated in the 1956-1961 5-Year Economic Plan.

Substituting Chemical Weapons for a Nuclear Deterrent (1960-1976)

Frustrated by the North’s inability to take advantage of civil unrest in South Korea during the 1960s, Kim Il Sung initially enunciated a strategic vision known as the “Four Military Lines” that called for the arming of the whole people, the fortification of the entire country, the training of soldiers as a cadre force and the modernization of arms. Kim subsequently expanded upon this to include supporting revolution in the South and international revolutionary movements. During

the mid-to-late 1960s, tensions on the peninsula escalated as the North oversaw an increasing level of aggression—guerilla warfare operations and assassination attempts in the South—as well as acts against the United States—the capture of the *USS Pueblo* in 1968 and the shooting down of an American EC-121M reconnaissance aircraft in 1969. This escalation brought what the North Korean leadership perceived as new US nuclear threats and renewed fears from the Fatherland Liberation War. It ended with Kim's purge of the "Partisan Generals," one of the strongest political factions not completely under his control that oversaw these operations and also interfered in domestic affairs. Aside from eliminating the last major obstacle to Kim's complete control of North Korea, with the purge, KPA strategy and doctrine began to transition away from guerrilla warfare to combined operations employing both conventional and special operations forces.

During this period, the North also continued to expand its nuclear research infrastructure through three steps:

- The program sending promising individuals to the USSR to be trained as scientists and technicians in related fields continued to grow, although the availability of sufficient numbers of fully qualified personnel would present a challenge throughout this period.
- Building upon previous experience, earlier agreements with the Soviet Union and funding from the first 7-Year Economic Plan (i.e., 1961-1967), the Academy of Sciences embarked upon what may be called first phase development of its nuclear program. In 1962, two atomic energy research centers were established at Pakchon and Yongbyon where the North's first nuclear research reactor and a 0.1 MWt critical facility for the production of medical and industrial isotopes as well as basic research were installed.
- The reorganization of the North's military-industrial infrastructure as well as the establishment of the Second Economic Committee and the Academy of Defense Sciences laid the organizational foundation for the research, design and production of nuclear weapons. These organizations faced significant challenges in rationalizing a diverse, inefficient and highly politicized weapons research, development and production system often at odds with itself.

The continuing reconstruction of North Korea's industrial and agricultural capabilities, aside from allowing for the modernization and expansion of the KPA, including the domestic production of a large percentage of its weapons, also facilitated the development of a large chemical industry. By the end of the decade, it appears that the North had begun production of chemical weapons, a decision probably meant as a response to the threat of US nuclear weapons and the belief that these weapons could help deter such threats. Further manifestations of this concern over the US nuclear threat were the establishment of a systematic program for the construction of underground facilities and a new emphasis on operations on the chemical and nuclear battlefield in KPA training. The Soviet Union is also believed to have provided some assistance in advanced defensive nuclear, biological and chemical (NBC) training and small quantities of related equipment. By the mid-1970s, the DPRK seems to have been well prepared for passive NBC defense while also possessing an offensive chemical warfare (CW) capability.

Since the production of nuclear weapons was likely only an aspirational goal at this time, the development of any coherent strategy built on these weapons had not begun. However, the North viewed chemical weapons as a viable substitute that, in combination with an expanding and modernizing KPA, could successfully deter the use of nuclear weapons by the United States.

Nuclear Weapons as Political/Diplomatic Symbols (1976-1989)

The transition in KPA strategy from guerrilla warfare to a focus on asymmetric warfare based on employing conventional and special operations forces continued, reinforced in part by lessons learned from the 1980-1988 Iran-Iraq War such as the utility of ballistic missiles and the effectiveness of massive use of artillery. It was also supported by the continued production of chemical weapons, the introduction of large numbers of new artillery systems, the mechanization of the ground forces, the expansion in the size of the armed forces and the introduction of short-range Scud ballistic missiles. This expansion and modernization was facilitated during the mid-1980s by a rapprochement with the Soviet Union, which provided deliveries of modern weapon systems, training and other military and economic assistance.

By the late 1970s, planning was well underway for the second phase development of the North's nuclear infrastructure that would take place through the 1980s. This phase included the construction of new reactors, a radiochemical separation plant, the establishment of additional research centers and a host of supporting developments. By the end of this period, the nuclear program had transitioned to the production of weapons-grade plutonium and the design of a weapon. By the mid-1980s North Korea was believed to be well on its way to producing prototype first generation implosion designs, including for a missile warhead, as a prelude to the production of fissile material.¹

Pyongyang's nuclear program entered a new phase at the end of that decade. Numbers of personnel sent overseas earlier to train in fields useful for developing a domestic nuclear program declined. The majority—many born during or immediately after the war and raised in a system that viewed the US as wanting to use nuclear weapons against the North—would now come out of domestic educational programs that continued to expand. Planning had also begun for a third phase of nuclear infrastructure development including construction of additional reactors and facilities (e.g., a 200 MWt reactor, waste storage facilities, etc.). Complementing this thinking was the acquisition of MiG-23 and MiG-29 aircraft, Scud B ballistic missiles, the establishment of a domestic ballistic missile production infrastructure and planning for longer-range ballistic missiles that supported KPA thinking about the need for nuclear weapon delivery systems.

As Pyongyang's nuclear development program advanced and missile and aircraft delivery systems were acquired, the KPA initiated a systematic study of US, Soviet and Chinese nuclear warfare concepts and strategies. By 1989, a rudimentary deterrence strategy had been developed that focused on the political and diplomatic utility of nuclear weapons rather than as tools to fight a war. The view appears to be supported by Kim Il Sung's reported pronouncement during

¹ It is conceivable that there may have been competing nuclear weapons designs from different research departments and institutes, and possibly an experimental or research HEU program using Calutrons and an associated HEU bomb design. Such programs could have been supported by the availability of relatively plentiful electricity during this period. Any such HEU program, however, was likely terminated by the early 1980s as all resources were focused upon the Pu program.

this period that nuclear weapons could not be used on the Korean peninsula due to its small size. In the minds of the North Korean leadership, the correctness of pursuing nuclear weapons as tools to enable room for political maneuvering was likely reinforced by the international political pressure brought to bear to compel them to sign the Treaty on the Non-Proliferation of Nuclear Weapons (NPT) in 1985. Until the time when nuclear weapons would become available, it appears that the North Korean leadership still viewed chemical weapons and expanding conventional armed forces, combined with emerging asymmetric capabilities, as the primary means of deterring the threat of US nuclear weapons.

Strategy Refined (1989-early 2000s)

This period, the most tumultuous in North Korea since the Korean War, included the collapse of its Soviet ally, China's rapprochement with South Korea, the rapid US victory over Iraq in Operations Desert Storm/Desert Shield, the death of Kim Il Sung and a deteriorating economy as well as widespread famine. Under these circumstances, in 1994, the North sought to capitalize on the political and diplomatic utility of nuclear weapons by accepting significant limits on its fissile material production program in the 1994 US-North Korea Agreed Framework in return for better relations with the United States. While the Agreed Framework froze the North Korean plutonium production program and effectively disabled much of Pyongyang's third phase nuclear infrastructure construction projects, it did not result in the elimination of the North's nuclear weapons ambitions or program.

Despite the 1994 agreement, Pyongyang continued, at the very least, to hedge against the possible failure of that arrangement and to consider the possible role of nuclear weapons in its future defense strategy. Nuclear research and development programs continued, as did the development of ballistic missiles—although longer-range weapons were subject to an agreed test moratorium with the United States. While foreign personnel would occasionally provide lectures or training, the nuclear program now received sufficient numbers of personnel from indigenous educational programs. The notable exception was the relationship with Pakistan and AQ Khan, which was initiated during the early 1990s during a visit by Prime Minister Benazir Bhutto to Pyongyang. By the end of the decade, that relationship would allow the North to move forward with a uranium enrichment program. Work on nuclear weapons design progressed, possibly to second-generation designs. Nuclear cooperation with Iran is believed to have also begun during this period although the level of cooperation and the effect it had upon the North Korean nuclear program is unclear.

In the midst of these events, Pyongyang's thinking about nuclear strategy also evolved. Detailed study of Operation Desert Storm probably resulted in the conclusion that the North's chemical weapons did not hinder the US from soundly defeating that nation nor could they deter nuclear use on the peninsula. Rather, chemical weapons were now increasingly viewed as basic tools with which to fight a war. Only nuclear weapons were seen as serving to deter the US nuclear threat and as political tools to ensure the North's deserved political prestige on the international stage. KCNA would state that:

The bloody lesson of the war in Iraq for the world is that only when a country has physical deterrent forces and massive military deterrent forces that are capable of overwhelmingly defeating any attack by state-of-the-art weapons, can it prevent war and defend its independence and national security.²

The adoption of a deterrence strategy, based on the KPA's study of other countries' nuclear strategies as well as the Iraq experience emerged in the early 2000s. This was after the collapse of the 1994 Agreed Framework when the North may have achieved an emergency nuclear capability based on a handful of weapons and ballistic missile delivery systems, primarily the Nodong medium-range ballistic missile. (Ballistic missiles were also a key component in the North's evolving asymmetric warfare strategy that had been given a new impetus during the decade as famine and economic collapse resulted in a decline in conventional military strength and an increase in weapons reaching obsolescence.) This in turn led the KPA to establish the Ballistic Missile Training Guidance Bureau to oversee the training, deployment, operation and development of doctrine for all ballistic missile units.

Supporting the evolving views of nuclear deterrence, there was a gradual shift in North Korean language about responses to US nuclear threats, emphasizing the role of these weapons as a political tool, reflected in rhetoric about the use of overwhelming artillery, conventional ground forces and ballistic missiles as well as Pyongyang's right to possess nuclear weapons as a deterrent to the US nuclear threat. For example, a 2002 Foreign Ministry statement declared that North Korea is:

...entitled to have nuclear weapons and more [powerful weapons] than those to safeguard our sovereignty and right to survive in response to the increasing US threat of crushing us with nuclear [weapons].³

Assured Retaliation Emerges (Early 2000s-2014)

North Korea's development of a nuclear force and strategy to deter the United States and to ensure regime survival continued during the years leading up to Kim Jong Il's death and afterwards. Two events—Libya relinquishing its WMD programs under pressure from the United States in 2003 followed eight years later by the March 2011 US attack on that country and the 2007 Israeli airstrike destroying a North Korean reactor under construction in Syria at al-Kibar—reinforced Pyongyang's view that neither event would have occurred had those nations possessed nuclear weapons. Indeed, key nuclear and missile programs accelerated under Kim Jong Il and became more visible at the end of his life. Since his death, Pyongyang under Kim Jong Un's leadership, has taken political steps to emphasize the importance of nuclear weapons, including enshrining their possession in its Constitution and emphasizing the simultaneous development of these weapons and the North's economy (the "byungjin" line).

Important developments point to the further elaboration of requirements for deterrence to buttress assured retaliation and perhaps some initial thinking on the use of nuclear weapons in a wider range of contingencies:

² "US 'Ruptured' Denuclearization Process," *KCNA*, May 12, 2003.

³ "Foreign Ministry Statement," *KCNA*, October 25, 2002.

- The reorganization of the Ballistic Missile Training Guidance Bureau into the Strategic Forces Command that appears to have the same status as the ground forces, Navy and Air and Anti-Air Commands, a clear indication of the elevated significance of ballistic missiles as a deterrent in the North's defense strategy.
- The continued acquisition of weapons necessary to further develop a survivable nuclear force and better able to fulfill a deterrence mission including: longer-range mobile weapons—the Musudan intermediate-range ballistic missile (IRBM) and the KN-08 intercontinental ballistic missile (ICBM)—and possibly sea-launched cruise and ballistic missiles based on surface ships or submarines.
- Significant progress in the production of fissile material, including the unveiling and expansion of a modern uranium enrichment facility and bringing back online a small plutonium production reactor as well as striving to develop more advanced, miniaturized weapons that can be mounted on delivery systems. During this period, Pyongyang conducted three nuclear tests presumably for this purpose and has made numerous public references to the importance of developing miniaturized nuclear warheads for ballistic missiles.
- North Korea has conducted a growing number of ballistic missile exercises during the last five years that have increased in size, realism (e.g., shoot-and-scoot), complexity (e.g., volley and time-on-target fire missions) and demonstrated capabilities (e.g., atypical flight trajectories). These capabilities are applicable to the use of both conventional and nuclear weapons in wartime.

The past five years have also witnessed a new sophistication in the North's articulation of its nuclear weapons strategy—the practical military application of these weapons and their utility in pursuing political priorities—that may be intended for external as well as internal audiences.⁴ Much of the rhetoric is very similar to US and Russian terminology with nuclear weapons usage characterized in battlefield, operational and strategic terms. However, while these statements on the surface suggest an important evolutionary step in the North's thinking about deterrence and strategy, they may also be understood as political rhetoric employed to mimic US statements or as an aspirational objective of KPA planners given the current small size of the North's nuclear stockpile and limited delivery capabilities.

Nuclear Strategy in 2020

All of these developments would seem to indicate that Pyongyang is striving for a policy of deterrence based, at the very least, on a more credible assured retaliation capability. This approach is reflected in North Korea's policy adopted by the Supreme People's Assembly (SPA) in 2013: "(Nuclear weapons) serve the purpose of deterring and repelling the aggression and attack of the enemy against the DPRK and dealing deadly retaliatory blows at the strong holds of aggression...."⁵

⁴ This language and terminology is reflected in the Supreme People's Assembly Law as well.

⁵ "Law on Consolidating Position of Nuclear Weapons State Adopted," *KCNA*, April 1, 2013.

The key question for the future is whether Pyongyang has the ambition to establish deterrence based on a strategy beyond assured retaliation that includes options for the limited initial use of nuclear weapons in order to bolster the credibility of deterrence. The SPA “Law on Consolidating Position of Nuclear Weapons State,” appears to at least posit the expansion of the role of nuclear weapons beyond deterring high-end attacks to also deter and repel lower levels of aggression using its nuclear weapons as a future objective. The law states:

The DPRK shall take practical steps to bolster up the nuclear deterrence and nuclear retaliatory strike power both in quality and quantity to cope with the gravity of the escalating danger of hostile forces’ aggression and attack.⁶

Logically, it may make sense for Pyongyang to move beyond relying on assured retaliation to a posture that threatens the limited early use of nuclear weapons to deter attacks by superior conventional forces. Just like NATO confronted by the Soviet Union during the Cold War and Pakistan faces India today, Pyongyang faces more capable American and South Korean conventional forces. However, if the North evolves in this direction, it will have to address some difficult challenges that will increase as the country’s nuclear inventory continues to grow and its arsenal of delivery systems expands.

Many of these challenges revolve around the classic question of “how much is enough” to deter the United States and other potential enemies, a question faced by every country that has decided to build nuclear weapons. While that determination is often driven by factors other than logic—such as technological momentum, resource constraints, and bureaucratic and political considerations—a related question is “what will be the DPRK’s theory of victory in a conflict that may involve threats or even the use of nuclear weapons?” That, in turn, would seem to lead to the possibility of the North considering whether nuclear weapons would be an appropriate response to a limited conventional attack as well as determining when and where to use these weapons.

There are hints that Pyongyang may move to address this question. The Central Committee of the Workers’ Party of Korea (WPK) released a report one day before the SPA Law was issued directing the military to begin such planning:

The People’s Army shall perfect the war method and operation in the direction of raising the pivotal role of the nuclear armed forces in all aspects concerning war deterrence and war strategy, and the nuclear armed forces should always round off the combat posture.⁷

But if Pyongyang does move down this road as its nuclear stockpile grows and its delivery systems diversify, it will face a number of additional hurdles. One major challenge will be the issue of command and control, namely can Pyongyang adopt a model that requires some pre-delegation of release authority for nuclear weapons in order to make the threat of early use credible, particularly given the assumption that an authoritarian regime like North Korea will be loathe to do so. Indeed, at least as of today, launch authority remains highly centralized and the

⁶ Ibid.

⁷ “Kim Jong Un Guides Party Plenary Meeting,” *KCNA*, March 31, 2013.

prerogative of the “Supreme Commander of the Korean People’s Army.” While change in this practice appears unlikely, predicting the future is complicated by the reality that Kim Jong Un’s leadership style is still evolving.

A number of other challenges will also have to be addressed by the North should it choose to move in the direction of planning for the possible limited use of nuclear weapons in response to a conventional attack. These include:

- The advanced deployment of delivery systems with their nuclear weapons to units as well as the necessary security for those deployed systems;
- A far greater requirement for coordination of nuclear use—tactics and doctrine—with ground force plans and operations to avoid high personnel and equipment losses;
- Access to greater real-time intelligence to address the fluidity of the modern battlefield, prevent a nuclear strike that would hit friendly troops and to maximize the effects of a strike on enemy forces; and
- More sophisticated command and control equipment and networks that work in concert with real-time intelligence to ensure friendly troops are not in the target area of a nuclear strike and more significantly control support, planning and firing commands that nuclear weapons units require to launch an effective strike. These command and control networks, and their associated equipment, have to be robust and secure enough to withstand concerted attack from an enemy.

Aside from technological and operational challenges, an additional factor to consider in predicting the future of Pyongyang’s nuclear strategy is unique national circumstances. North Koreans often argue that military hardware has to be adapted to Korean circumstances and realities, an argument that probably also applies to nuclear weapons and seems relevant given Kim Il Sung’s past skepticism about the use of these weapons. To the extent that Pyongyang’s war plans are based on the expectation of actually winning a war and inheriting South Korea’s wealth, avoiding widespread, indiscriminate and unnecessary damage would seem to be important, once again driving the North in this direction. However, even in the context of building a force of more accurate, lower yield nuclear weapons, there also may be a significant political/psychological barrier to their use by North Korean leaders on the peninsula, namely these weapons would be used against the Korean people.

Keeping in mind the development of North Korea’s deterrence strategy over time, that strategy’s most recent manifestations and the possible technical, political and other challenges facing Pyongyang in formulating a future approach, how might its nuclear strategy evolve in the future? An earlier paper in this study posited three scenarios for the future of North Korea’s nuclear weapons stockpile and delivery systems until 2020.⁸ Those scenarios were:

⁸ David Albright, “Future Directions in the DPRK’s Nuclear Weapons Program: Three Scenarios for 2020,” US-Korea Institute at Johns Hopkins School of Advanced International Studies, February 2015, <http://38north.org/2015/02/dalbright022615/>.

1. A small nuclear stockpile of 20 weapons and delivery systems that are focused primarily on targets in Northeast Asia with an emergency operational capability to field a few ICBMs;
2. A larger stockpile of 50 weapons once again focused primarily on Northeast Asia (there would be a greater diversification of these systems to include more modern mobile theater range missiles and more sea-based systems) and a greater ICBM threat; and
3. A stockpile of 100 weapons with an even greater ability to attack targets in Northeast Asia and the United States.

While it is unclear whether capabilities will be driven by strategy or vice versa, for the purposes of this study, it is assumed that strategy will continue to evolve depending on the size of Pyongyang's stockpile and the capabilities of these delivery systems. Taking into account these capabilities, North Korea's nuclear strategy may change along the following lines.

1. Low-end Scenario

In this scenario, North Korea will be armed with 20 nuclear weapons and will be able to field only minor improvements in its current force of 1,000 ballistic missiles able to reach most targets in Northeast Asia, including limited deployments of rudimentary sea-launched systems and possibly the fielding of the road-mobile Musudan IRBM in an emergency operational status. (A small number of Taepodong ICBMs may also be deployable in an "emergency operational status.") Pyongyang seems likely to continue to rely on a policy of assured retaliation, threatening the use of these weapons in response to a nuclear attack by the United States. If necessary, the use of these weapons against targets in South Korea will be allowed only under extreme conditions. The threshold for use against targets in Japan may be lower.

2. Medium Scenario

In this scenario, Pyongyang's nuclear deterrent will grow to 50 weapons with a growing variety of yields—most in the 10-20 kiloton range, but with a few that may reach 50 kilotons. Its delivery systems will include additional mobile theater-range missiles, including the new road-mobile Musudan IRBM that could become operational after a limited number of tests and possibly including greater numbers of weapons based at sea. In addition, Pyongyang's KN-08 road-mobile ICBM could achieve an "emergency operational status" as it moves to an operational capability. A concerted research, development and production program will allow for the deployment of 2-4 sea-launch ballistic missile systems. As a result of these developments, Pyongyang will possess a more survivable and robust assured retaliatory capability able to more credibly threaten targets in Northeast Asia and the United States. Pyongyang's greater assured retaliatory capability may allow for the development of some limited options for the use of these weapons in a conflict against theater targets, particularly in Japan. Still, the limitations on nuclear use on the Korean peninsula will likely remain significant.

3. *High-end Scenario*

In this scenario, North Korea would successfully accelerate its development and deployment of nuclear weapons and delivery systems. As a result, Pyongyang's nuclear stockpile would grow to 100 weapons by 2020 and include significant advances in weapons design such as miniaturization and a wider variety of yields. These weapons could be delivered by a growing array of battlefield, theater and intercontinental delivery systems including a new solid-fuel missile to replace the SCUD, greater deployments of Musudan IRBMs, the fielding of operational KN-08 ICBMs and the deployment of more capable sea-launch ballistic missile systems.

While Pyongyang would certainly have an even more robust assured retaliation capability, because of the size of the force as well as its variety of delivery systems and nuclear devices, the North could consider a further evolution in its nuclear strategy beyond assured retaliation and allow for threatening "first use," but probably only under certain conditions (e.g., the leadership perceives that a ROK or US invasion is imminent). In that context, battlefield nuclear weapons would be integrated into Pyongyang's war plans and the limited use of these weapons on the peninsula would be provided for also under certain conditions. The threshold for use against Japan would be lowered as well.⁹

Should North Korea produce smaller tactical nuclear weapons, these would likely present challenges to their strategists and planners. Available information suggests that Kim Jong Un and the North Korean leadership hold the belief that any nuclear weapons usage against the North would be a strategic attack designed to eliminate the leadership and subjugate the nation. There is also the stated belief of Kim Il Sung that the small size of the Korean peninsula makes the use of nuclear weapons impractical. This same information suggests they believe that any North Korean nuclear weapons usage would be interpreted as a strategic operation. Moreover, there is the challenge of integrating tactical and operational nuclear weapons usage into known KPA strategies and doctrines. Complicating these factors is that a dichotomy of thought may exist within North Korea concerning the utility of nuclear weapons with low and mid-level military and civilian specialists having a realistic understanding and senior leaders attributing these weapons with far greater political, physical and military capabilities than is justified.

In this context, Pyongyang would probably have no such hesitation in using nuclear weapons against Japan. It would not be hard to imagine that if the tide turned against the North, in part, because of Japan's role in assisting the US and South Korea, Pyongyang would not hesitate in using these weapons against civilian and military targets in that country.

⁹ Nuclear strategies do not necessarily dictate how these weapons might actually be used during crisis or conflict. "No first use" can quickly become first use and a "first use" strategy could be overridden in favor of restraint.

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