

WORKSHOP REPORT

Second Order Threats from North Korea's Nuclear Weapons Program

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NCNK
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Introduction

In December 2021, the National Committee on North Korea and the Carnegie Endowment for International Peace convened a two-day workshop featuring seven experts from the United States, China, and Russia to consider a range of threats associated with North Korea's nuclear weapons program. Because many of these threats are not normally considered in the course of policy discourse on North Korea, which focuses overwhelmingly on strategic nuclear weapons and delivery systems, the workshop framed these threats as “second order” threats; this framing does not diminish the importance of these threats in general, however.

Workshop participants were asked to explore the following themes:

1. Implications and potential unintended consequences of an evolving North Korean command-and-control structure, particularly in relation to the potential deployment of tactical nuclear weapons and/or sea-based nuclear forces and managing unintended nuclear escalation.
2. Prospects and consequences of a nuclear accident in North Korea, related to either a nuclear reactor incident or the accidental detonation of a nuclear device.

In 2022, a peer review panel considered the content of the workshop summary and offered helpful input which was incorporated into the final draft.

The following report distills the main points from the workshop discussion and highlights recommendations on how to mitigate risk around North Korea's nuclear weapons program. This paper reflects the views of the participants alone and not those of the National Committee on North Korea, the Carnegie Endowment for International Peace, or any other organizations.

Since the workshop was convened, Russia's invasion of Ukraine—and the ensuing fighting near nuclear facilities—has underscored the salience of these topics in other contexts. Meanwhile, new developments in North Korea, including the May 2022 acknowledgement by the state of the arrival of Covid-19 within its borders and the June 2022 meeting of the Central Military Commission on matters related to military command and control, highlight the continued importance of this line of inquiry. In April 2022, North Korea announced its first-ever delivery

system for tactical nuclear weapons: a close-range ballistic missile system¹. This missile system is not known to have been deployed as of July 2022.

Context on Command and Control

Like other states in possession of nuclear weapons, North Korea's leadership seeks high assurance that nuclear weapons will always work and be available to use when needed. At the same time, it seeks high assurance that these weapons will never be used without authorization or detonated by accident. The procedures and technical choices implemented to balance this so-called always-never dilemma are foundational to its nuclear command and control practices².

Understanding the full picture and quality of North Korea's command-and-control system remains difficult, with substantial gaps in knowledge in the open source, but public comments and leadership decisions seem to suggest that North Korea presently favors procedures and measures to never allow unauthorized use of nuclear weapons; or, in other words, negative controls. Kim Jong Un has strong incentives to prevent unauthorized use or an accidental nuclear detonation given the response it might invite from the United States or China. Evidence for such negative control preferences is embodied in Kim's sole authority to launch nuclear weapons, which is most authoritatively codified in the 2013 'Law on Consolidating Position of Nuclear Weapons State'³, the suspected separation of warheads and delivery systems⁴, and the possibility of a sole nuclear warhead storage site⁵. (Ambiguity about these practices remains.)

North Korea, however, could change its overall orientation when it comes to nuclear command and control. A shift toward favoring positive controls—procedures and measures to ensure weapons will always be available for release and work—could be precipitated by development of new tactical weapons or the deployment of a sea-based nuclear weapons delivery capability, both of which have been indicated as priorities for the regime. In times of crisis, North Korea

¹ Josh Smith, "Analysis: North Korea Could 'Go Small' with Tactical Nukes," *Reuters*, April 22, 2022, sec. Aerospace & Defense, <https://www.reuters.com/business/aerospace-defense/nkorea-could-go-small-with-tactical-nukes-if-it-resumes-testing-2022-04-22/>.

² Peter D. Feaver, "Command and Control in Emerging Nuclear Nations," *International Security* 17, no. 3 (1992): 160–87, <https://doi.org/10.2307/2539133>.

³ "Law on Consolidating Position of Nuclear Weapons State Adopted," KCNA, April 1, 2013.

⁴ See Chapter Nine in Ankit Panda, *Kim Jong Un and the Bomb: Survival and Deterrence in North Korea* (Oxford University Press, 2020).

⁵ Jeffrey G. Lewis, "New Construction at Yondoktong," *ArmsControlWonk*, March 2, 2021, <https://www.armscontrolwonk.com/archive/1211166/new-construction-at-yondoktong/>.

may seek to enhance deterrence by signaling a shift in favor of procedural positive controls; for example, by indicating the delegation of nuclear use authority from Kim Jong Un to commanders in the Korean People's Army. (This would signal that a decapitation strike on Kim himself early in a crisis would have little to no effect on North Korea's ability to release nuclear weapons.) There are clear tensions between North Korea's current "peacetime" emphasis on negative controls and North Korea's nuclear strategy based on first use and pressures to "use-it-or-lose-it" in times of crisis.

Workshop Discussions on Command-and-Control

Many important unknowns remain surrounding North Korea's command-and-control practices. Particularly concerning to participants was the ambiguity about what command-and-control looks like when Kim Jong Un is sick or incapacitated or if there were to be a coup or other substantial internal instability in the country. However, it was suggested that the introduction of the First Secretary of the Workers Party of Korea position in early 2021 may be a first step in creating an order of succession within North Korea, which hopefully indicates similar planning on the nuclear side.

Additional concerns were raised about how North Korea manages personnel reliability at its nuclear facilities. Given the strong level of ideological and psychological vetting for the Supreme Guard Command charged with the personal security of Kim Jong Un and his family, it was assumed the same level of vetting must occur for those entrusted with North Korea's nuclear facilities. However, given the strong ideological tendencies towards distrust, questions were raised about how technicians may interpret technical problems or incidents during times of crisis.

There was some back and forth on signaling and what North Korean leaders mean when they declare North Korea a "responsible nuclear state." Some viewed this as a signal that North Korea wants to develop a new relationship with the global nuclear order, like India, which has largely gained international tolerance of its nuclear weapons program despite its place outside of the Treaty on the Non-proliferation of Nuclear Weapons (NPT) and even signed a civilian nuclear energy cooperation deal with the United States. But there was skepticism that these normative considerations would outweigh strategic considerations during a period of crisis. Others argued that such rhetoric was signaling less about a strategy of use and more to create a

perception that North Korea would not proliferate nuclear technologies. Further on signaling, participants shared the view that North Korea may not appreciate the value of clear signals but may rather be sowing confusion intentionally as a tactic.

Apart from these signals on use, participants highlighted some reassuring constraints that may dissuade the adoption of certain forms of positive control. For example, because of North Korea's lack of strategic situational awareness or lack of sophisticated intelligence, surveillance, and reconnaissance (ISR) capabilities, its officials are unlikely to favor "fail deadly" measures—like threatening the automatic release of nuclear weapons should Kim be killed—to enhance deterrence. As Pyongyang's situational awareness capabilities improve, this may change. Workshop participants also expressed the view that a North Korea with more robust ISR capabilities could itself be reassured that declaratory statements of non-hostility by the United States and South Korea were credible (i.e., North Korea could verify the lack of a military build-up on or around the Korean Peninsula using its own means).

During a crisis, any action by North Korea to prepare nuclear forces for use in a crisis would have implications for stability. U.S. and allied remote sensing capabilities could help monitor whether North Korea, in a crisis, is mating delivery systems and warheads. Because such detection could result in strong incentives for a preemptive attack on North Korea by the U.S. and its allies, Pyongyang may only move to take such measures under the most extreme circumstances. Participants expressed concerns about the extent to which U.S. ISR would accurately be able to assess North Korean intentions and behaviors during a crisis. Given the way that a country's command-and-control system must develop along broader nuclear and deployment policies, participants noted that there are other indicators worth watching to understand how North Korea approaches command-and-control. For example, exercises to practice rapid response may provide more understanding about possible shifts in North Korea's nuclear posture.

The ambiguity surrounding North Korea's command-and-control practices and its implications for crisis management raised the consensus that more engagement with North Korea is needed to mitigate misunderstandings, reduce risk, and potentially offer safety assistance. However, an inherent challenge to engaging North Korea on such issues is the perceived trade-off that such engagement provides legitimization of North Korea as a nuclear state and could dilute denuclearization negotiations. Assistance of this nature would place the United States in

violation of Article I of the NPT to not assist non-nuclear weapon states with the acquisition or control of nuclear weapons; despite the putative nuclear risk reduction benefits, similar initiatives have been rejected in the past (for instance, regarding Pakistan). Participants agreed that the US was not best positioned to lead, and that such engagement would be better suited for China and Russia. However, such an initiative might not be a high priority for either country. Participants also raised some concern about the reliability of the information or advice China and Russia would provide in such meetings or North Korea's receptivity to Chinese or Russian engagement.

Given the issues surrounding US, Russian, and/or Chinese led engagement, many participants agreed that multilateral fora that addressed nuclear issues broadly, and not just dialogue about North Korea, would be the best format for engagement and would engender more likely North Korean participation. Addressing mistrust will be critical to the success of such engagement. For example, technical assistance to enhance nuclear weapons safety would require North Korea to disclose information about nuclear weapons designs, but getting North Korea to share such sensitive information would be impossible if it thought such assistance was likely to abet deception or was an act of sabotage.

Workshop Discussions on Accidents and Nuclear Security

Following repeated bouts of environmental distress, including extensive flooding at the Kuryong River, there is growing concern about North Korea's nuclear safety conditions. In recent years, North Korea has struggled to ensure a consistent water supply to their reactors, particularly at the Yongbyon facility, where the 5 MW(e) gas-graphite reactor and still-inoperative Experimental Light Water Reactor are located. Due to the lack of transparency, much is unknown about the precise status of the as-yet-unready Light Water Reactor or their disaster response mechanisms in case of a crisis. North Korea has no experience operating an LWR. This raises concern over the possibility of a water-related nuclear safety incident, including the potential for a Fukushima-type meltdown, which would be especially problematic given Yongbyon's proximity to the river and agricultural regions. Other possible accidents that should be given serious consideration include an accident in the Yongbyon Reprocessing Facility or a nuclear waste-handling accident. Finally, accidents in the course of nuclear weapons assembly—or preparations for nuclear testing—deserve attention.

In the case of any adverse incident involving its nuclear programs, participants expressed concern that North Korea would be reluctant to disclose information with the international

community, or that such communication would be seriously delayed. There was near consensus in the discussion that there needs to be increased communication with North Koreans on nuclear safety issues, but participants debated how best to approach this cooperation. Foremost, international actors should seek to create an environment that destigmatizes and normalizes accident reporting so that North Korea feels safe enough to acknowledge an incident as soon as it happens, and believes it is in their best interest to accept disaster assistance.

Given North Korea's fear of sabotage, it could be useful to frame this cooperation in terms of accident response and disaster management in general, and not about North Korea in particular. One participant felt it would be prudent to compartmentalize the energy program at Yongbyon as a separate issue from wider nuclear activity, which would be politically sensitive. A sample dialogue could involve an information exchange about best practices, guidance on how to do contingency planning, and a survey of what North Korea is equipped with at Yongbyon in the case of a nuclear safety incident.

Another important topic of discussion was the role international actors should play in monitoring and responding to a nuclear accident or incident. North Korea is particularly sensitive to any IAEA observation of its nuclear facilities. Despite previously granting IAEA monitors access to Yongbyon, North Korea expelled all IAEA inspectors in 2009 and seems unlikely to allow them to return in the near future. Considering North Korea's broader distrust of international organizations, participants felt the most fruitful way to engage on nuclear safety issues would be through bilateral or trilateral regional initiatives. Although the United States and its allies have great interest in preventing such a crisis, it was unclear whether or how it should be involved in any related diplomatic process, given its strained relationship with North Korea. A Chinese and Russian role was seen in more positive terms given the closer geopolitical relations between Pyongyang and these states in the contemporary context, but political will in Moscow and Beijing to pursue outreach on these matters remains questionable.

In terms of forums, there was broad support for a bilateral or regional approach over proposed alternatives, since working with small groups could build trust and consistent channels of communication on the issue area. A more political forum like the P5 of the United Nations Security Council may not be well received in North Korea, who may interpret this kind of cooperation as contingency planning or "plotting against North Korea." Inter-Korean channels could be useful, especially since the 1992 Joint Declaration includes built-in verification measures. However, some participants felt it would be best to avoid strictly inter-Korean forms of cooperation, since it risks being too political. Finally, the Moscow Nonproliferation Conference was suggested as a possible venue to initiate some of these discussions since North

Koreans already participate in it, but some participants questioned the utility of doing so, since it wouldn't provide an opportunity to interact with North Korean technical experts⁶. If it were feasible, a regional nuclear safety conference that includes channels for expert participation could ameliorate this challenge.

Recommendations

- International actors should seek to resume observation at North Korean nuclear facilities, specifically Yongbyon, as soon as in-person visits become feasible again. This kind of access is unprecedented in the Kim Jong Un era but is urgently needed, given the possibility and dire consequences of a nuclear safety accident.
- Based on previous experience, cooperation should be initiated through the Foreign Ministry first in order to get meaningful access to experts. Although the Foreign Ministry is somewhat marginalized on these topics themselves, without their involvement, any effort to work on North Korean nuclear safety and security issues will elicit standardized, canned responses.
- Creating the conditions for cooperation and transparency may require a broad reevaluation of the sanctions regime and what it is able to achieve.
- One idea for structuring possible cooperation could be drawn from South Asia, where India and Pakistan participate in an annual bilateral exchange of their list of nuclear facilities, which each party vows not to attack. In the North Korean context, an exchange with South Korea could be implemented alongside a US-ROK assurance that they'll never attack these facilities—including acts of cyber sabotage. This won't necessarily solve concerns about sabotage, but could be a helpful confidence-building measure for broader diplomacy around these issues. Because South Korea may disproportionately benefit from such assurances given its far greater reliance on nuclear power plants and other facilities for national power generation, Seoul could offer asymmetric assurances that it would not attack North Korean power plants in a conflict.
- Acknowledging the difficult nonproliferation issues that may arise from information sharing and technical cooperation North Korea, stakeholders should nonetheless explore how to engage North Korea on these issues given the shared interest in reducing nuclear accidents and improving safety related to North Korea's nuclear program. A multilateral format may provide the best option to engender North Korean participation.

⁶ The 2022 iteration of the conference did not proceed as planned due to Russia's invasion of Ukraine. The future of the conference is unclear.