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North Korea's Weak Nuclear C2 Challenges Korean Crisis Stability by Nathan Beauchamp-Mustafaga

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North Korea's steady march toward a credible, survivable second-strike nuclear capability is changing the nature of a potential conflict on the Korean Peninsula. The deployment of a road-mobile nuclear intercontinental ballistic missile (ICBM), now expected by the early 2020s, will dramatically expand the geographical confines of the next crisis and mark the first time a non-allied country has developed the capability to credibly strike the continental United States since China in 1981. As the Trump administration reviews North Korea policy against the backdrop of rising tensions over recent DPRK missile tests, it should consider whether to support limited and likely indirect nuclear command and control (C2) assistance – specifically negative controls to prevent unauthorized nuclear employment – to North Korea to enhance crisis stability

This growing nuclear threat raises the stakes of the next crisis on the Korean Peninsula and challenges many assumptions regarding deterrence and operations in Northeast Asia. The US government is rethinking aspects of its approach, including how to deter a nuclear-armed DPRK. There is even discussion of fighting a limited war with North Korea, triggering debates about how to credibly signal limited US objectives to Pyongyang to limit nuclear escalation. Yet the conversation often overlooks a fundamental assumption of deterrence theory – the viability of Pyongyang's nuclear C2.

Deterrence is premised on the assumption that the adversary has control over its nuclear arsenal and that there must be a connection between US signaling and the adversary's use of nuclear weapons. Weak nuclear C2 undermines this building block of deterrence theory, as it significantly increases the possibility that adversary nuclear weapons are employed accidentally or without authorization. This increases uncertainty and incentivizes preemptive strikes on adversary nuclear capabilities, increasing crisis instability. While there are many components to C2, perhaps the most important is specific control over the employment of nuclear weapons. Writing in 1985, Ashton Carter broke this into two categories: "negative controls" to prevent unauthorized nuclear use and "positive controls" to enable authorized use. Regardless of what one may think of North Korea and its possession of nuclear weapons, all parties can agree that negative controls of DPRK nuclear weapons are critical for crisis stability because, as Carter asserted, "nuclear forces must be managed in crises without unwanted provocations."

Despite the importance of this issue, there is limited public information on the North's nuclear C2 procedures and even less on its C2 technology. According to a 2014 Chatham House report, "Of all nuclear possessor states, the least is known about North Korea's command and control, and history of nuclear incidents." If the past is any reference, there is little reason to believe Pyongyang has invested heavily in nuclear C2, as "all nuclear powers have devoted comparatively modest resources to improving their command and control systems," instead favoring the actual weapons themselves. What little we do know is that the North's public statements suggest an ambitious C2 requirement, claiming that Pyongyang needs "nuclear warheads deployed for national defence always on standby so as to be fired any moment" and that Kim Jong Un has final authority over nuclear use.

North Korea's drive for a survivable second-strike capability poses additional challenges for its nuclear C2 for both technical and procedural reasons. The North's current ICBM, the *Taepodong-2*, can only be launched from the Sohae launch pad and takes several days to prepare for launch, allowing for minimal nuclear C2 requirements. However, the North's road-mobile ICBMs will likely require advanced C2 technology to maintain central control of nuclear employment if Kim does not pre-delegate launch authority.

The North's likely reliance on human restraint without technical mechanisms makes it easier for local commanders to employ nuclear weapons in a crisis, which increases crisis instability. By comparison, the United States has developed strong technical and procedural negative controls on the employment of nuclear weapons. These efforts have focused in part on permissive action links (PAL), which are "a device included in or attached to a nuclear weapon system to preclude arming and/or launching until the insertion of a prescribed discrete code or combination." Weak DPRK nuclear C2 will create two related challenges during a crisis – the potential for accidental or unauthorized DPRK nuclear use, and subsequent pressure on US, ROK, and Japanese leaders to conduct preemptive strikes against the North's missiles – a powerful combination that exacerbates destabilizing factors on the Peninsula.

The Cuban Missile Crisis illustrates the stark dangers of weak nuclear C2 for crisis stability. It was later learned that the Soviet commander in Cuba, Gen. Issa Pliyev, had requested permission to remove Soviet nuclear warheads from storage, and the captain of a Soviet submarine in the Atlantic, Valentin Savitsky, intended to respond to US depth charges with a nuclear torpedo. Although Pliyev was overridden by superiors in Moscow and Savitsky was vetoed by his second in command, these procedural restraints were no guarantee for

future non-use. Soviet nuclear weapons "were not equipped with permissive action links to prevent unauthorized launch by field commanders," and thus "General Pliyev had the technical capability to launch the nuclear-armed missiles without final authorization from Moscow."

Addressing the dangers of weak nuclear C2, the United States is known to have assisted the Soviet Union and others in strengthening their systems. While nuclear experts have advocated for expanding this policy to unrecognized nuclear powers, mainly Pakistan, no one has addressed the question of North Korea. Harold Agnew, former director of Los Alamos, proposed the United States "should share" warhead security technology with "anybody who joins the club […] The most important thing is that you want to make sure there is no unauthorized use. You want to make sure that the guys who have their hands on the weapons can't use them without proper authorization."

The United States should consider whether it should support efforts to improve North Korea's nuclear C2, specifically negative technical and procedural controls over nuclear use. This would not mark an endorsement of the North's nuclear program or improve its offensive capabilities, but would instead be a reasonable action taken in the interest of all parties to enhance crisis stability. While the most effective option would be for North Korea to acquire a version of PALs, procedural controls such as the two-man rule, which requires two authorized people to launch a nuclear weapon, would still be a significant benefit. Although there are other central elements of C2 that contribute to crisis stability, such as positive controls like communications with forces in the field, enhancing the survivability of the North's military communications would weaken US-ROK deterrence and limit military options if a conflict did occur, ruling out this kind of assistance.

Navigating these waters will be tricky, but such efforts cannot be abandoned out of difficulty. The US government would likely be very concerned with providing direct assistance to North Korea, due to legal restrictions, US military secrecy and fear of a public backlash. To the extent possible, the United States should coordinate with its allies in South Korea and Japan, though this may pose challenges. North Korea may also not accept any US help out of strategic mistrust. However, its 2013 law says, "the DPRK shall establish a mechanism and order for [nuclear weapons] safekeeping and management" and that it would "cooperate in the international efforts for nuclear non-proliferation and safe management," suggesting there may be some DPRK willingness for international cooperation on this issue. If North Korea will not accept outside technical assistance for fear of a secret kill switch, then procedural assistance or even general discussions on nuclear security are a step toward enhanced crisis stability.

A more realistic path might be for China to lead these efforts, as it would benefit by reducing the risk of accidental nuclear use on its border and provide another platform for US-China cooperation. Beijing could offer C2 assistance to North Korea, either by directly sharing C2 technology and best practices or by engaging Pyongyang in such discussions to raise awareness. One limitation is that China is not known to possess PALs, but it has other technical capabilities and procedures it could share with North Korea, especially the two-man rule. Pakistan could also support efforts by engaging with the North on this issue, as it reportedly has some indigenous version of PALs. While it may seem counterintuitive to support an adversary's nuclear systems, refusing to acknowledge the North's nuclear capability will not improve crisis stability, and this limited, and likely indirect, assistance would support US and allied interests in reducing the possibility of nuclear use on the Korean Peninsula.

The consequences of a failure in North Korea's nuclear C2 are simply unacceptable. A 2014 Chatham House report examining near nuclear use around the world found 13 cases, of which at least four were caused completely by human technical error outside of crisis scenarios. The report recounts the now-famous 1979 and 1980 NORAD incidents that were caused by an "exercise tape […] of a Soviet nuclear attack" being taken as real and a "faulty computer chip." If North Korea has not established itself as a bona fide nuclear power already, its likely deployment of a survivable second-strike nuclear force capable of striking the United States early in the 2020s requires fresh thinking for crisis stability. One place to start is by ensuring that the North's nuclear weapons are not employed by accident or without authorization.

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