

## STRATEGIC TRENDS RESEARCH INITIATIVE

# NORTH KOREAN NUCLEAR COMMAND AND CONTROL: ALTERNATIVES AND IMPLICATIONS

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## INTRODUCTION

North Korea's nuclear strategy is in transition. Evidence suggests that it may soon possess viable second strike capabilities for retaliatory deterrence purposes, but it is already developing options for a more ambitious regional warfighting nuclear strategy—a strategy to enable limited first-use of nuclear weapons against regional targets, while threatening U.S. cities as a means to deter a full retaliatory response from the United States.<sup>1</sup>

Central to North Korea's emerging nuclear strategy will be the command and control system it establishes to manage and operationalize its arsenal. It will need to develop appropriate arrangements, from its vantage, to maximize deterrence and the operational utility of its nuclear forces under a range of crisis and conflict scenarios. The kind of nuclear command and control (NC2) system North Korea adopts will have potentially profound implications for the combined U.S. and Republic of Korea (ROK) deterrence posture and defense planning with respect to strategic stability, crisis escalation, and options for degrading North Korean nuclear threats.

Unfortunately, little is known about the type of NC2 arrangements North Korea is considering and research on the different approaches it may take, and their implications, is sorely lacking.<sup>2</sup> This report helps close that analytical gap by offering a framework of alternative NC2 systems North Korea might adopt. It identifies the tradeoffs and dilemmas associated with each model that will likely shape North Korea's ultimate NC2-related decisions and assesses what the available evidence suggests about the direction it may take. Lastly, it explores the implications for North Korea's emerging nuclear strategy as well as U.S.-ROK deterrence and defense planning. In doing so, it provides U.S. and allied policymakers and military planners with a clearer picture of North Korea's emerging nuclear posture, and a roadmap for managing the growing complexity of this challenge.

## FINDINGS SUMMARY

The primary NC2 dilemma for North Korea stems from its peculiarly hierarchical political, military, and social structure—a veritable “one-man rule” system.<sup>3</sup> Conventional wisdom suggests that North Korea maintains a highly personalized command structure over its nuclear arsenal to ensure Kim Jong Un's absolute authority over its disposition and use. However, if North Korea seeks a credible assured retaliation or warfighting nuclear strategy, it must adopt procedures for transmitting or transferring release authority beyond Kim in anticipation of developments that would prevent or weaken his ability to communicate with his forces. Otherwise, attacks on Kim personally could be an effective means to neutralize North Korea's nuclear arsenal. Such a single point of failure in North Korea's nuclear strategy would belie any claims that it can credibly absorb attacks and emerge to impose unacceptable costs on an adversary—essential elements for both assured retaliation and warfighting strategies.<sup>4</sup>

There are four basic command models North Korea might adopt to convey launch authority beyond Kim: “automaticity,” devolution, delegation and pre-delegation. Automaticity—or the proverbial “button on Kim's desk”—would adhere most closely to the “one-man rule” system that prevails in Pyongyang. Devolution would involve an institutionalized line of political succession and authority over the weapons, while delegation and pre-delegation would be military-oriented command structures aimed at enhancing operational resiliency, responsiveness, and flexibility. Each model features distinct advantages and vulnerabilities for North Korea with implications for the type of nuclear strategy it can credibly adopt. Each also presents different exploitation opportunities for the United States and Republic of Korea—in terms of strategic communications, information operations, and kinetic actions that could undermine North Korea's nuclear strategy. The models also pose varied risks with respect to conflict escalation.

In an effort to maximize the utility of its nuclear forces while minimizing the vulnerabilities of any single command model, North Korea may be moving toward a hybrid approach that combines elements from different models. This might involve some form of delegation and deployment of so-called tactical weapons to front-line units for use on or around the peninsula, while Kim maintains an automatic-style command structure over longer-range, higher-yield systems to preserve his absolute authority over those weapons that presumably would be used for more “strategic” purposes. Importantly, should North Korea adopt this type of hybrid model, it would be the clearest indicator to date that it is embracing a regional nuclear warfighting strategy. For a less ambitious nuclear strategy focused largely or exclusively on assuring a secure retaliatory capability, such an approach would introduce unnecessary complexity and risks.

While North Korea indeed may be moving toward a hybrid NC2 system, it is important to avoid a singular analytic focus on any one model. The available evidence is murky at best; ambiguity over North Korea’s NC2 is a feature, not a bug—at least at present. Moreover, its NC2 system may evolve in non-linear ways over time. It could adopt one model today but, as domestic and strategic circumstances change, adopt a different approach in the future. For instance, should Kim perceive an imminent threat from the United States and/or South Korea, he may opt for a highly (pre)delegated model with all of its inherent risks in order to maximize operational resiliency and responsiveness against potential attacks. But the Kim regime is notoriously paranoid about internal rivals, not just external threats. Should Kim’s hold on domestic power wane, he might move toward a highly assertive, automatic-type of command model to affirm and better ensure his sole authority over the weapons.

Assessments of alternative NC2 structures North Korea may adopt should inform the assumptions and objectives of efforts to tailor the U.S. and combined U.S.-ROK deterrence posture and update combined operational plans.<sup>5</sup> It will become increasingly important to detect and characterize North Korean decisions related to NC2 in order to develop appropriate indicators and warnings, identify exploitable weaknesses, and assess potential operational and strategic risks. Special attention should be given to balancing the need to degrade a potentially more complex North Korean NC2 architecture with possible escalation risks. Wargaming the implications of alternative North Korean NC2 structures for combined U.S.-ROK planning would help to better identify potential targets of opportunity, operational and capability requirements, and risks for countering its growing arsenal. This report provides an analytical framework to help policymakers and military planners prepare for these important tasks.

## METHODOLOGY

This report presents findings from an 18-month study, involving a number of research elements: an extensive review of the relevant policy and academic literature; interviews with experts in government and the non-government specialist community; a workshop to vet internal findings; and briefings to offices across the U.S. and ROK national security communities to solicit feedback and input for the final report.

Research on the NC2 systems used by other nuclear-armed states was conducted to develop and evaluate a framework of alternative NC2 models that North Korea might adopt. A review of the existing literature on North Korea’s strategic culture, leadership style, decision-making, and evidence about its nuclear doctrine, capabilities, and operations was conducted to assess what the evidence suggests about the challenges each model presents for North Korea and the direction it might take.

Interviews conducted with more than 20 intelligence, policy and military specialists in government and the non-government expert community provided valuable insight on early assessments and the implications for deterrence and defense planning. A workshop in March 2022 brought together experts from the non-government analytical community with former and current government officials to vet the interim findings. Between May and July 2022, revised findings were briefed to U.S. and ROK government offices to gather final input for this report.

The analysis and views presented herein, however, are solely those of the authors.

## ANALYSIS

The capabilities North Korea is investing in, the way it talks about nuclear weapons, and the way it exercises using them against regional military targets all portend a dangerous shift in its nuclear strategy.<sup>6</sup> While it may be close to possessing capabilities for an assured retaliation deterrence posture, North Korea is also moving toward a regional warfighting strategy that presumably envisions limited nuclear strikes on its neighbors, while using threats against U.S. cities to deter an overwhelming U.S. response.

Central to the credibility of North Korea's emerging nuclear strategy will be the NC2 system it develops to operationalize its arsenal. NC2 entails administrative procedures, organizations, and technologies for managing and employing nuclear weapons only when, where, and how national leaders decide.<sup>7</sup> The requirements for NC2 grow more demanding and complex as forces become larger and more diverse and strategy evolves from "minimum deterrence" focused on assured retaliation to a more instrumental or operational warfighting approach.

There is growing evidence that North Korea in fact is paying increased attention to NC2, even if it may still be a long way from making decisions and executing plans. It recently signaled that it might soon deploy so-called tactical nuclear weapons to front-line units—something the state media claimed would "enhanc[e] the efficiency in the operation of tactical nukes"—and that it would be prepared to use these weapons preemptively.<sup>8</sup> While North Korea has long *talked* about operationalizing an ambitious nuclear strategy along these lines, there has been little information to date to suggest what it is actually *doing* to support or enable this goal.<sup>9</sup> Most interviewees suggested that North Korean NC2-related statements remain aspirational, as it continues to seek an approach that balances competing priorities.

Indeed, the type of NC2 system North Korea ultimately adopts will likely be shaped primarily by two powerfully contending imperatives. First is its strategic environment. It confronts adversaries with far-superior conventional and nuclear capabilities. Research on other nuclear-armed states suggests such factors should lead North Korea to adopt a delegated NC2 system, involving dispersed forces and the de-centralized authority to use them to maximize resiliency and responsiveness.<sup>10</sup> Second are domestic or cultural factors that present countervailing pressures. North Korea's uniquely hierarchical political, military and social structure—a "one-man rule" system—suggests that it should adopt a highly "assertive" NC2 architecture involving tight physical and administrative controls that prioritize Kim Jong Un's absolute authority over nuclear matters, even at the expense of operational readiness and flexibility.<sup>11</sup>

Conventional wisdom suggests North Korea maintains a highly personalized command structure due to these overriding domestic considerations. As the U.S. Defense Intelligence Agency recently assessed: "Kim Jong Un has established through public policy statements and legislation that he [the individual] is the sole release authority for North Korean nuclear weapons use against any adversary."<sup>12</sup> The principal risk of such a personalized command structure is that it invites attacks on Kim personally as an effective way to neutralize North Korea's nuclear weapons, thus undermining the deterrent credibility of an assured retaliation or warfighting strategy. To ensure or enhance credibility, North Korea would need plans, procedures and processes for transmitting or transferring launch authority beyond Kim Jong Un himself.

The four basic command models mentioned earlier that North Korea might adopt to convey launch authority ("automaticity," devolution, delegation or pre-delegation) all pose significant tradeoffs for the Kim regime and its emerging strategy. The next section frames these four alternatives and introduces a fifth option—a hybrid model that combines elements from two of the basic approaches. This discussion explores what each model might look like in North Korea, the associated tradeoffs for the regime, and what the available evidence suggests about the direction North Korea may take. This is followed by an analysis of

what these alternatives might mean for North Korea’s emerging nuclear strategy. The final section explores the implications for U.S. and allied deterrence and defense planning.

### ASSESSING FIVE ALTERNATIVE MODELS

“Automaticity” or the proverbial “button on Kim’s desk” would perhaps be the simplest command model for North Korea to adopt. It would likely involve a pre-programmed or pre-recorded order that could be transmitted to the force under extraordinary circumstances in which Kim fears an imminent attack might remove him from command. This approach would seem most appropriate for North Korea’s “one-man” rule political system: Kim would retain sole, personal launch authority. At the same time, this would be the approach that is most vulnerable to outside threats because it represents a single point of failure— Kim Jong Un himself. It also would offer little or no adaptability or flexibility in the employment of nuclear forces. A launch order likely would be pre-determined and programmed (e.g., “launch all available weapons from predesignated launch sites against preplanned targets”) to expedite its transmission to units in a time of extreme stress.

An automatic type of command structure would prioritize Kim’s singular launch authority over military readiness and responsiveness. As such, it would likely include tight physical controls over the weapons themselves to prevent others from gaining custody of operational weapons. Figure 1 offers one possible approach for how this model would work. The weapons are de-mated with the warheads and delivery systems maintained at separate locations under distinct but parallel chains of command. An organ of the Workers’ Party of Korea might have custody over the warheads at one location, while North Korea’s Strategic Forces would have custody over the delivery systems at a separate location. During a time of crisis, Kim could order assembly and dispersal of the weapons and for nuclear operators to stand-by for further orders.

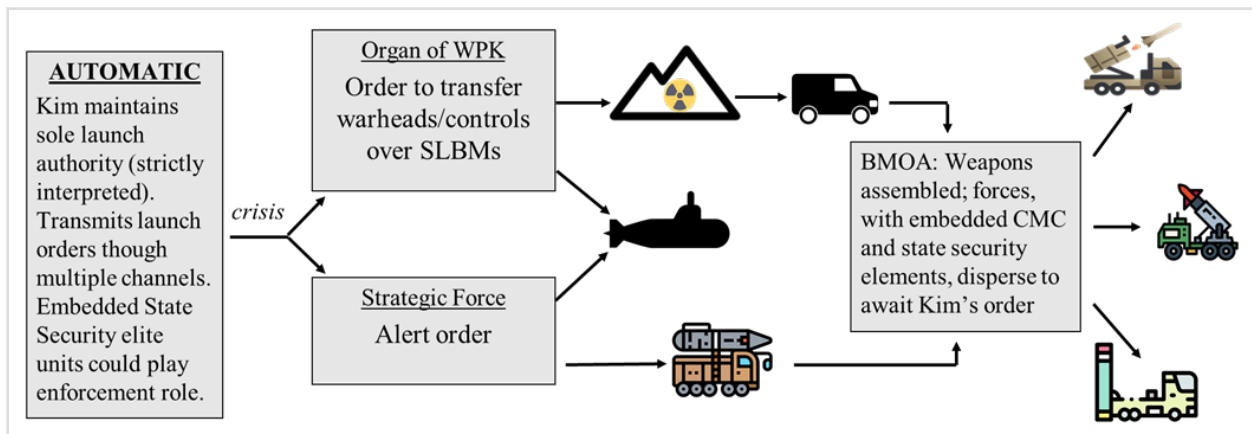


Figure 1. Notional Automatic Command Structure

A second model, devolution, would entail an institutionalized line of succession to maintain political continuity over nuclear operations should something happen to Kim or his ability to communicate with nuclear forces. Importantly, this would ensure political authority and flexibility to bring a potential conflict to an end, if Kim is no longer present to do so, prior to a larger nuclear exchange. However, this approach likely presents the greatest domestic political vulnerability for Kim. It would at least nominally identify a potential successor, undermining North Korea’s leader-dominant or *Suryong*-based system of governance on which the Kim regime has long relied. As with all authoritarian regimes, establishing a line of political succession could create alternative centers of domestic power, rivalries, and even challenges to Kim’s rule.<sup>13</sup>

At the same time, devolution might undermine North Korea’s assured retaliation deterrent because there may be questions about whether the “next in line” would respond to an attack that incapacitates Kim or choose not to respond as a means to preserve his or her survival.

Devolution is not a model that can be executed reliably in an *ad hoc* way during a time of intense crisis. A line of political succession would need to be clearly delineated, codified, and promulgated well ahead of a conflict to lower rungs in the chain of command with reference to conditions under which orders from someone other than Kim are to be followed. It is difficult to imagine North Korean nuclear operators following orders without assurances that those orders are legitimate. The “alternate” Supreme Commander also would need to have a separate command center from which to manage nuclear forces; this official cannot be at the same location as Kim, if he is expected to be the target of attacks. Further, this individual would require a sufficient level of knowledge and understanding of North Korea’s nuclear capabilities and operations in order to manage the forces effectively, if and when the time comes. As a result, a devolution approach could not be kept completely secret for very long.

There is no clear evidence that North Korea is adopting a devolution model. But if Kim decides to pursue this approach, he might be expected to look to his family bloodline or the Party for a successor, as suggested in Figure 2. Most North Korea watchers interviewed for this project suggested that should Kim Jong Un choose to name an heir apparent, it would likely be his sister, Kim Yo Jong. She has long been identified as someone who is being groomed as a potential successor, at least until Kim’s son, who is reported to be about twelve years old, comes of age. But her relative lack of credentials and, especially, her gender in a highly patriarchal society means that her appointment could face resistance within North Korea.

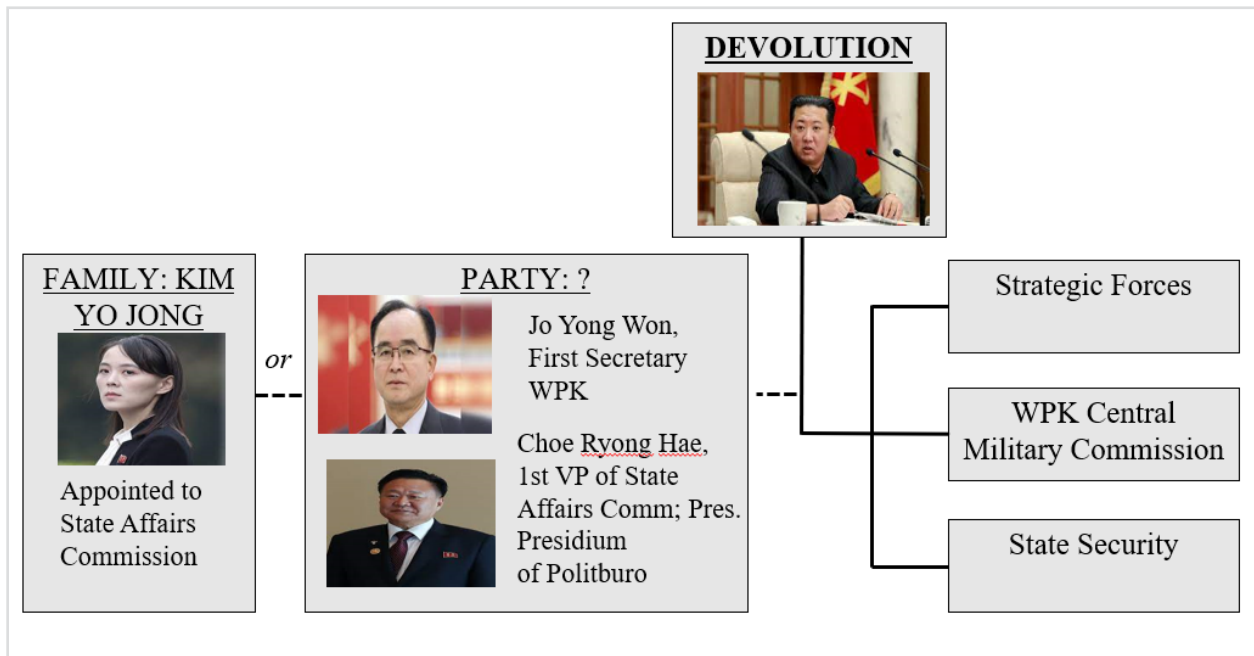


Figure 2. Possible Devolution Model

Alternatively, Kim may look to Party officials close to him for a potential successor. Choe Ryong Hae, who has long been close to Kim and is the First Vice President of the State Affairs Commission, is thought to be one candidate. Some speculate that he had watch over the North’s nuclear arsenal when Kim and his sister attended the 2018 Singapore Summit with U.S. President Donald Trump.<sup>14</sup> However, most North Korean experts engaged during the course of this project expressed the belief that an heir apparent would likely

need to be from the Kim family bloodline in order to maintain regime legitimacy among important internal constituencies. Thus, while anointing Kim Yo Jong might face some resistance, those obstacles may pale in comparison to appointing someone outside the family.<sup>15</sup>

A third model, delegation, is one in which Kim could grant discretion over employment decisions to military authorities after he has made a decision that the use of nuclear weapons is required. This would allow him to maintain centralized control over release authority for as long as possible, delegating operational decisions only after he issues a launch order. This approach would provide military officials with some flexibility over the execution of the decision to employ nuclear weapons but not the decision itself. A key challenge in such an approach is calibrating the timing of the transmission of launch authority. Whether for political reasons or poor situational awareness, Kim could wait too long to delegate launch authority or he could be eliminated or incapacitated prior to delegating authority. Alternatively, he could delegate too soon out of fear that he might be the target of decapitation strikes and cede the ability to manage a crisis to a conclusion in which he survives.

The fourth model, pre-delegation, would involve transferring conditional launch authority to the military in anticipation that Kim might lose contact with his forces or become incapacitated—likely at the outset of a crisis, not as a matter of day-to-day operations. Of the four basic alternative models, pre-delegation maximizes military readiness and flexibility over when, where, and how to employ nuclear weapons. But it would increase the risk of unintended or accidental nuclear attacks because those at lower echelons may not have the situational awareness necessary to make appropriate employment decisions. This type of model would also institutionalize a command structure in which Kim signals to his own people that others are equally or better suited to make such fateful decisions for North Korea, potentially undermining his absolute authority. If others are capable of such awesome responsibility, some might wonder, why decisions in other important areas cannot also be decentralized or delegated.

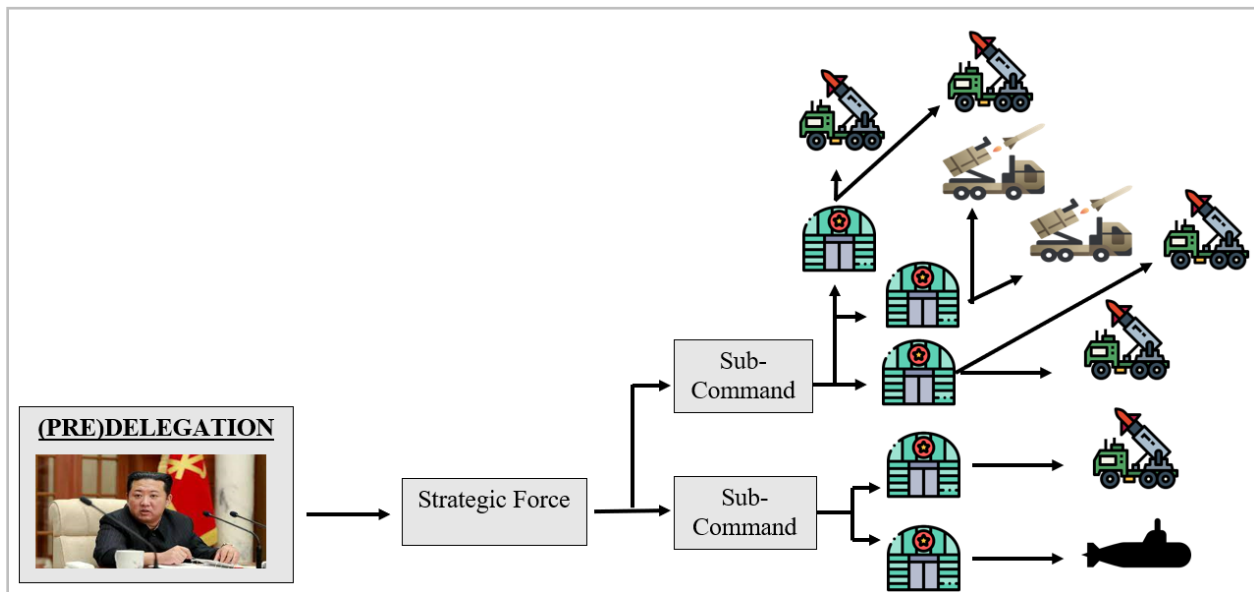


Figure 3. (Pre)Delegation Model

Whereas devolution is about maintaining political continuity over nuclear decision-making, delegation and pre-delegation are military-oriented command models. As a crisis escalates, forces in the field would presumably have operational weapons with expressed or conditional authority to use them. As a result, these approaches would depend heavily on Kim’s trust that his military would faithfully and effectively carry



out orders as intended. But Kim has historically not shown much trust in his military leadership. Rather, the exceptionally high rate of turnover among his senior military leadership—compared to that of his father and grandfather—suggests he may harbor a great deal of distrust toward his military.<sup>16</sup>

There is some evidence that North Korea may be considering a fifth option—a diversified or hybrid NC2 system based on weapon type and function, with the goal of limiting the risks of delegation or pre-delegation to a small number of elite units. Pyongyang has signaled in recent years an intent to deploy short-range missiles that are reportedly capable of carrying nuclear munitions, which it increasingly refers to as “tactical weapons,” to the front-lines. Assigning the “tactical” moniker to these systems may be aimed at communicating to adversaries a shift in its nuclear strategy toward warfighting. This might also be part of an effort to build an internal narrative justifying the delegation of authority over some nuclear capabilities—previously called, categorically, “the nation’s life.” Establishing a clear distinction between strategic and tactical weapons, as one South Korean expert notes, may “signal that Pyongyang will separate the delegative and assertive command and control models according to the type of nuclear capabilities in the near future.”

As Figure 4 suggests, this approach might include forward-deploying pre-assembled weapons for use on or around the peninsula with what today is Artillery Command under the General Staff. Authority to use these weapons could be delegated or pre-delegated under specific conditions. North Korea’s higher-yield, longer-range systems that could target Japan, Guam, and the continental United States might be held under different authorities, employing a highly assertive NC2 system in which those weapons are de-mated and kept separate until ordered to be assembled and dispersed. Kim would maintain an automatic-type of sole launch authority over these “strategic” systems.

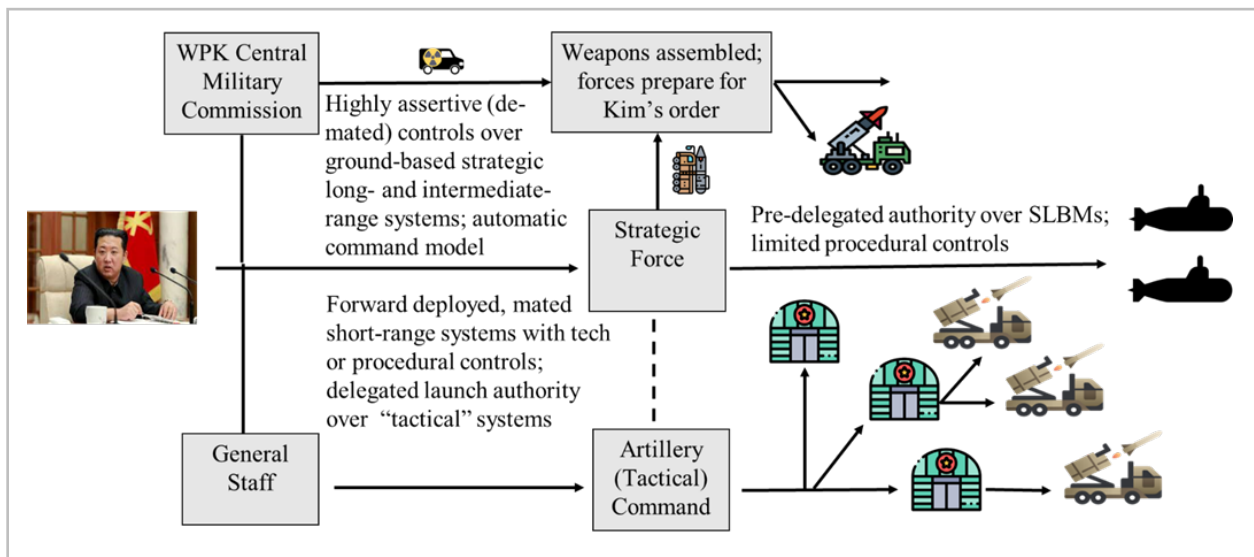


Figure 4. Possible Hybrid NC2 Model

North Korea’s effort to field submarine-launched ballistic missile (SLBM) capabilities introduces a host of other NC2 challenges that deserve special consideration. These weapons would need to be pre-assembled and operational if and when they are put out to sea, implying that Kim would rely on procedural controls (e.g., a two-man system) to preserve launch authority.<sup>17</sup> However, North Korea’s submarines are likely to be highly vulnerable for the foreseeable future. To minimize these vulnerabilities, some interviewees suggested North Korea may opt for loading the pre-mated SLBMs and flushing the submarines at the first sign of crisis with pre-delegated orders. For instance, boat captains could be under orders to launch their weapons against preplanned targets unless they receive a “no-go” order within a certain time period. However, others

suggested such an approach would be too risky for Pyongyang and expressed skepticism that it would deploy a submarine-based nuclear force in the near future due to its operational vulnerabilities. They noted, however, that in an effort to complicate adversary decision-making, it is possible North Korea could take steps to convince leaders in Washington and Seoul that it had made significant progress in such capabilities and perhaps had even deployed them.

## IMPLICATIONS FOR NORTH KOREA'S EMERGING NUCLEAR STRATEGY

There are essentially four nuclear strategies North Korea might adopt, each having different implications for NC2 requirements. Two stem from what Herman Kahn defined as a “spasm” retaliation strategy that envisions inflicting maximum destruction without much consideration of what comes next.<sup>18</sup> This “all or nothing” approach could lead to either an early-use or late-use strategy depending on whether North Korea is primarily concerned with survival of the regime or of its weapons. It might adopt an early-use spasm strategy, for instance, if it thinks that it will have only one opportunity to use its weapons because they are vulnerable to attack. In this case, the principal fear is disarming rather than decapitating strikes. As a result, the North might orient its posture based on a “use or lose” assumption that the longer a conflict goes on, the more likely U.S. and ROK forces will degrade and eventually neutralize its arsenal. Alternatively, it might adopt a late-use spasm strategy if it fears that any use of nuclear weapons—no matter how limited—would result in a regime-ending response. Under such circumstances, Kim presumably would want to maintain sole release authority deep into any conflict in order to maximize his flexibility to bring that conflict to an end in which he survives.

Whether biased toward early- or late-use, however, a spasm strategy would have very similar NC2 requirements—fundamentally, being able to detect that an action has occurred that warrants a nuclear response and then transmitting a simple, one-way “go” order to the force.<sup>19</sup> The main difference between early and late spasm strategies is the timeframe in which North Korea would want to have operational weapons available to nuclear operators awaiting launch orders.

An automatic NC2 model that reflects the highly personalized approach to nuclear decision-making often attributed to North Korea is viable only for these spasm strategies. Automaticity does not offer the flexibility required for a more ambitious strategy (discussed below). At its core, automaticity would entail a simple, one-way order to execute, designed to expedite the transmission of that order to the force if and when Kim fears for his own safety or his ability to communicate with his forces. By contrast, devolution or some form of delegated NC2 arrangement would introduce unnecessary complexity and risks for a spasm strategy given that political and military judgment concerning nuclear employment decisions is no longer needed once an “all or nothing” order is given.

Two alternative strategies, however, would dictate NC2 arrangements that are qualitatively different from those associated with a spasm strategy. One is a controlled retaliation strategy intended to enable strategically focused but recognizably limited nuclear strikes, while threatening greater destruction still, to “restore deterrence” during a conflict. The other is a warfighting strategy that would enable iterative, even graduated strikes that seek to degrade or defeat conventional operations, while holding hostage population centers to deter escalation.

Controlled retaliation and warfighting strategies require both the detection and characterization of adversary actions to inform a decision to respond that, by design, is intended to be carefully calibrated to impose proportional costs tailored to specific political-military circumstances. These strategies presuppose the ability to employ nuclear weapons in a limited way in order to end a conflict prior to what would be (for North Korea), a suicidal larger-scale nuclear exchange. Someone will be required to make judgments and decisions regarding the appropriateness of nuclear employment options and issue legitimate orders under extraordinary circumstances to achieve desired ends.

For these reasons, a devolution approach to NC2 would appear necessary to support the credibility of either a controlled retaliation or warfighting strategy. Without a legitimate line of succession, the credibility of either strategy would be suspect because a single point of command and control failure would persist. The incapacitation of Kim Jong Un would likely lead to a breakdown in coordination and could fatally undermine these nuclear strategies. This would lead either to the neutralization of North Korea's nuclear arsenal or to general nuclear war if release authority had been previously conveyed. Who would issue the "cease fire" order?

The primary difference in NC2 requirements between controlled retaliation and warfighting strategies is that a warfighting strategy would almost certainly require either delegation or pre-delegation to at least those nuclear units designated as "tactical." Kim Jong Un could not realistically expect to maintain the situational awareness necessary to order iterative nuclear attacks in a timely manner during a potentially fast-moving conflict in which his forces are likely under fire. Target sets might be highly prescribed in order to prevent unintended escalation and to de-conflict fires, but nuclear operators would need some degree of flexibility and discretion if the hope is to execute militarily effective nuclear strikes in highly unpredictable circumstances.

Three conclusions can be drawn based on this brief overview of potential interactions between strategies and approaches to NC2. First, a highly personalized command structure is viable only for a spasm "all or nothing" strategy for which political and military judgment are unnecessary once a launch order is given. Second, the lack of evidence that North Korea is adopting a devolution model calls into question the viability of its purported nuclear strategy ambitions and points toward exploitable vulnerabilities (discussed below). Third, a hybrid model involving some form of delegation is necessary only for strategies that place a premium on operational flexibility and decision making discretion.

## IMPLICATIONS FOR DETERRENCE AND DEFENSE PLANNING

There are at least two broad areas for considering the implications of the foregoing assessment for U.S. and combined U.S.-ROK planning: considerations related to deterrence and strategic stability, and consideration of opportunities and risks associated with actions the alliance might take to exploit its knowledge of North Korea's NC2 system to achieve operational or strategic advantage. These observations are limited by the current state of knowledge and understanding of North Korea's intentions and plans. As these mature, more refined assessments should be possible.

### Considerations for Strategic Stability and Deterrence

Each of the NC2 arrangements raises potential issues for strategic stability and deterrence. For example, a spasm strategy underpinned by an automatic command model might create first strike incentives that lead to crisis instability but could also dis-incentivize behavior that leads to a crisis in the first place. During a conflict in which Kim feels threatened, he could decide that there is greater advantage in using nuclear weapons "too early" rather than "too late." At the same time, if U.S.-ROK leaders are confident that Kim maintains sole release authority, they may have incentives to conduct counter-leadership strikes at the earliest opportunity. But recognizing that a crisis could quickly escalate to a "use or lose" situation might dis-incentivize Kim from engaging in behavior that precipitates such a crisis.

Similarly, a controlled retaliation strategy backed by possible devolution of launch authority might enhance crisis stability but embolden provocative behavior. If North Korea has a robust assured retaliation capability, regardless of what happens to Kim, there would be fewer incentives on both sides to launch a first strike. But North Korean confidence that it can manage the risks of escalation in a crisis might embolden it to engage in the types of provocations that lead to situations in which nuclear weapons might come into play.

Consideration of these and potentially other notional tensions or tradeoffs leads to a question: Does or should the United States and its South Korean ally have a preference regarding the NC2 system that North Korea adopts? The diagram below offers one way to think about a potential order of preference. Most preferred might be an automatic command arrangement for a late-spasm strategy because it would be primarily focused on Kim's survival and pose the least risk of unintended escalation or accidents. On the other end is a warfighting strategy underpinned by a pre-delegated or hybrid NC2 arrangement that likely would pose the greatest risk of unintended escalation.

If there is a preferred U.S.-ROK arrangement, a second question emerges: What, if anything, can be done to influence North Korea's decisions? It might be exceedingly difficult to reshape the underlying motivations driving North Korea's NC2, but U.S. and South Korean policymakers must consider whether it is worth trying. To date, it would appear that the strategic signaling out of Washington and Seoul is mixed messages that might shape North Korean thinking in different ways.

Some strategic communications arguably could incentivize North Korea to adopt a late-spasm strategy backed by an automatic command model. For instance, statements indicating that there would be a regime-ending response to any use of nuclear weapons, such as in the 2018 U.S. *Nuclear Posture Review*, might encourage Kim to jealously guard his sole authority over that decision for as long as possible, deep into a conflict.<sup>20</sup> Conversely, counterforce or damage limitation posturing and preemptive strike signaling, such as in the 2019 U.S. *Missile Defense Review* or in ROK statements regarding its "kill-chain" capabilities, arguably could incentivize NC2 that prioritizes operational flexibility and responsiveness, such as early-use strategies underpinned by some form of delegation.<sup>21</sup>

The United States and South Korea should consider unilateral and coordinated messages that seek to incentivize certain North Korean nuclear arrangements over others, with crisis stability considerations in mind. At the same time, there may be deterrence benefits in some degree of mixed messaging, if this leads Kim to question whether he can predict the ways in which the alliance would respond to a nuclear attack or a nuclear threat.

## Exploitation Opportunities and Risks

Each NC2 model also presents unique exploitation opportunities and risks for U.S.-ROK military planners to consider.

As previously noted, an automatic command arrangement for an early- or late-spasm strategy would present a single point of failure—Kim Jong Un—in North Korea's NC2 system that could be exploited through counter-leadership targeting. The logical inference that such an approach would involve tight physical controls over the weapon systems (i.e., peacetime storage of warheads and delivery systems at separate locations under parallel chains of command) to vigilantly protect Kim's absolute authority presents three additional exploitation opportunities.

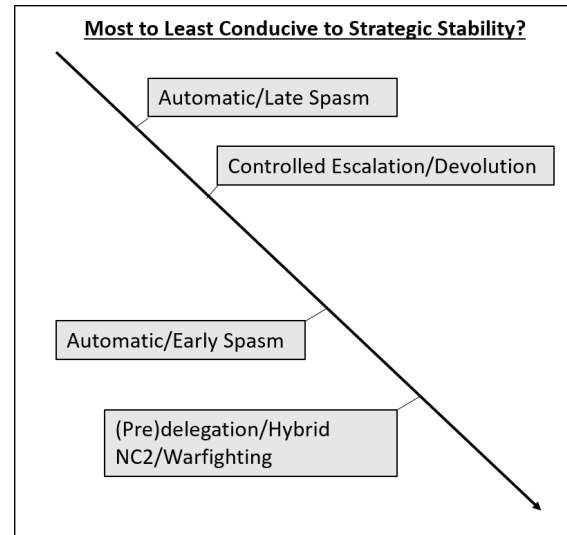


Figure 5. Notional Order of Preference

1. Storage sites would be key points of vulnerability prior to weapon assembly. Attacking those sites or supporting transportation or logistic networks in a way that inhibits weapon assembly would effectively delay or neutralize North Korea's launch capability.
2. Force generation or alerting schemes involving multiple organizations and facilities are likely to provide the earliest and least ambiguous indicators of preparations for an attack. The alliance would have a longer period of time to execute defeat operations than if the weapons were pre-mated.
3. North Korean forces would likely be poorly trained and prepared to execute highly complex operations under extraordinary stress, since the peacetime imperative is to protect Kim's absolute authority at the expense of military readiness. This could lead to operational mistakes and failure, providing real-time targets of opportunity to limit nuclear threats.

An automatic command structure presents a number of risks for U.S.-ROK military planners, revolving mostly around an inherent uncertainty over the nature of that system and whether North Korea maintains an early- or late-use spasm strategy. North Korea could adopt some version of a "dead hand," involving the automated launch of nuclear strikes should something happen to Kim. It is unclear what such a system would look like or how reliable it would be without a "human in the loop." Most interviewees doubted such an option would be viable for North Korea—but the possibility cannot be ruled out. There would also be uncertainty regarding whether North Korea is primed to use nuclear weapons early or late in a conflict. Even if it planned to withhold launching its weapons for as long as possible to provide room for a resolution short of a major nuclear exchange, efforts to neutralize North Korea's nuclear capabilities could trigger an immediate spasm attack. At the same time, U.S.-ROK restraint or hesitation could similarly be catastrophic, if the North plans on using nuclear weapons early.

Devolution presents Kim Jong Un with domestic vulnerabilities because it would require at least symbolically identifying a suitable successor. The United States and South Korea could exploit these vulnerabilities in a number of ways.

1. Information operations could undermine the internal North Korean narrative legitimizing Kim's absolute rule.
2. Efforts could be made to empower Kim's designated successor with the goal of encouraging alternative, rival sources of power that sow internal divisions and discord, potentially weakening the regime.
3. Offers of a "golden parachute" or a similar type of arrangement with the heir-apparent would be intended to encourage nuclear restraint in a crisis or conflict.

If no institutionalized line of succession is forthcoming to support NC2, the principal exploitable vulnerability is less personal and more strategic. For instance, North Korea cannot credibly claim to have a robust assured retaliation or warfighting strategy and, at the same time, claim that Kim maintains sole, indivisible authority regarding the employment of nuclear weapons. Effective messaging on this point—that Pyongyang cannot have it both ways—could undermine the strategic value of its nuclear posturing.

If North Korea adopted a devolution model, the United States and South Korea would have to assume some degree of political continuity in the command and control of North Korean nuclear operations during a conflict, even should something happen to Kim. There would be a heightened degree of risk in a situation where North Korea could more credibly claim to have an assured retaliation or warfighting strategy. However, if the devolution scheme is only "one deep," there are limits to any strategic leverage North Korea might gain. Two points of failure, as opposed to one, would certainly complicate potential targeting or disruption operations—but not by an order of magnitude. A deeper line of succession that identified a greater number of successors that goes two, three or four people down the line would present a more difficult challenge, but would also compound the domestic vulnerabilities Kim may fear most.

In delegated or pre-delegated NC2 approaches, eliminating or significantly reducing the North Korean nuclear threat becomes an increasingly difficult and risky task. Still, there are possible opportunities for exploitation, including:

1. Information operations that target lower-echelon military commanders and operators to encourage restraint. This would involve communicating that everyone in the chain of command will be held accountable for the use of nuclear weapons, while restraint will be rewarded.
2. Targeting (and, as necessary, re-targeting) communication lines and nodes early in a crisis could be critical to disrupting delegation orders, assuming launch authority would not be transferred until a conflict appears imminent.
3. Close monitoring of North Korean specialized units offers opportunities to gain observable data and identify vulnerabilities. Such units likely undergo routine training and exercises to enable highly sensitive, complex operations under highly stressful conditions.
4. Prior to (pre)delegation, North Korea's NC2 would still be beset by a single point of failure without devolution.

There is a high degree of risk associated with an NC2 model that involves the dispersal of operational weapons and the decentralized authority to use them. It may be unclear whether authority has been delegated or pre-delegated. Delegated authority connotes an imminent attack that may warrant preemptive strikes. Pre-delegated authority suggests nuclear employment would be conditional; one condition would likely be if nuclear forces are under fire. Conducting information operations to encourage restraint among nuclear operators, moreover, might not provide U.S. and ROK leaders with the confidence needed to withhold efforts to eliminate those targets. Even if a North Korean nuclear commander was able to communicate back to allied forces that he would not launch weapons under his command, it is unclear how much credence U.S. decision-makers would place in that pledge. In the fog of war, it may be exceedingly difficult to accept the associated risks. Time would be essential and neither side would want to be a slow "second responder," leading to heightened escalation risks.

A hybrid NC2 system by definition would carry with it some of the same vulnerabilities for North Korea as the two basic NC2 models from which it draws. Still, this type of approach enables North Korea to mitigate potential internal and external vulnerabilities, such as the credibility problems associated with an automatic NC2 concept that eschews naming a successor and thereby risks a break down in North Korea's strategy should Kim become incapacitated or unavailable. A hybrid system that allows him to rapidly (pre)delegate launch authority to nuclear operational units might bolster deterrence against decapitation strikes, provided he can convey authority beforehand and communicate this to Washington and Seoul. At the same time, limiting (pre)delegation to a small number of elite units with so-called tactical weapons minimizes the internal challenges associated with devolution or a purely pre-delegated system that could undermine his hold on power.

There are two risks for the alliance that are not unique to the hybrid model but may be more pronounced than in a strictly delegated or pre-delegated system because of the complexity and potential robustness of the approach. One risk concerns the dangers of escalation, in particular escalation risks associated with targeting conventional missiles that are commingled with nuclear systems. This concern could lead to constraints on targeting during a conventional phase of conflict even if it results in greater operational risk for the combined force. The second risk concerns regime instability scenarios, which would pose increasingly complex challenges for how the alliance might respond. It would be possible for multiple, vying factions to have independent control over nuclear weapons.

## KEY FINDINGS AND RECOMMENDATIONS

**Finding:** North Korea’s ability to operationalize an assured retaliation or warfighting nuclear strategy will depend on the NC2 system it establishes. The arrangements it adopts will also have important implications for strategic stability, crisis escalation, and U.S.-ROK options for countering related threats. Unfortunately, little is known about North Korea’s NC2 architecture or how it might evolve.

- **Recommendation:** The U.S. intelligence community should provide assessments of alternative NC2 systems North Korea might adopt in order to shape and inform efforts to tailor the U.S. and combined U.S.-ROK deterrence posture and update combined operational plans.
- **Recommendation:** The Defense Threat Reduction Agency (DTRA), working with intelligence community and Department of Defense partners, should establish a cross-organizational capability to detect and characterize North Korean decisions related to NC2 in order to develop appropriate indicators and warnings, identify exploitable weaknesses, and assess potential operational and strategic risks. Findings of this process could be incorporated, as appropriate, into DTRA operations plans for Korea contingencies (e.g., so-called “break glass” plans).

**Finding:** There are five alternative NC2 models North Korea might adopt—automaticity, devolution, delegation, pre-delegation, and a hybrid approach that combines elements from different models. Each has advantages and vulnerabilities for the type of nuclear strategy North Korea can credibly adopt. Each also presents different exploitation opportunities and risks for U.S.-ROK policymakers and military planners.

- **Recommendation:** Existing exercises and simulations in theater should take account of alternative North Korean NC2 pathways when considering the nuclear dimension of potential crises and conflicts. Out-briefs to USINDOPACOM and USFK staffs are a logical point of departure. DTRA should sponsor or co-sponsor table-top exercises involving relevant intelligence, military, and policy offices to sharpen the identification of opportunities, risks, and requirements for deterring and countering North Korea under alternative NC2 schemes presented in this report. Finally, DTRA should confer with OSD officials regarding how findings of this report should or could be integrated into ongoing extended deterrence dialogues with South Korea.
- **Recommendation:** While avoiding singular focus on any one NC2 model, U.S. and ROK military planners, supported by DTRA, should pay special attention to balancing the need to degrade a potentially more complex North Korean NC2 architecture with possible escalation risks.

**Finding:** Each of the NC2 arrangements has different implications for strategic stability and the risks of escalation.

- **Recommendation:** U.S. and South Korean policymakers should consider tailored unilateral and coordinated messages that seek to incentivize certain North Korean nuclear arrangements over others, with crisis stability considerations in mind.
- **Recommendation:** DTRA should be prepared to feed insights from this report and follow-on NC2 work into Track I or II engagements with North Korea, should they materialize. The goal should be to better understand North Korea's NC2 approach and influence its thinking on the issues of primary concern for the United States.

- <sup>1</sup> Léonie Allard, Mathieu Duchâtel, and François Godement, "Pre-empting Defeat: In Search of North Korea's Nuclear Doctrine," *Policy Brief*, European Council on Foreign Relations, November 22, 2017; Shane Smith, "North Korea's Evolving Nuclear Strategy," *North Korea's Nuclear Futures Series* (Washington, DC: US-Korea Institute as SAIS, 2015).
- <sup>2</sup> Notable exceptions include Ildo Hwang, "North Korea's Nuclear Command and Control Estimate: Variables and Trends," *Korean Journal of Defense Analysis*, Vol. 33, No. 4, December 2021, pp. 617–638; Ankit Panda, *Kim Jong Un and the Bomb: Survival and Deterrence in North Korea* (New York: Oxford University Press, 2020), pp. 225–252; Vipin Narang and Ankit Panda, "Command and Control in North Korea: What a Nuclear Launch Might Look Like," *War on the Rocks*, September 15, 2017, available at: <https://warontherocks.com/2017/09/command-and-control-in-north-korea-what-a-nuclear-launch-might-look-like/>; and Austin Long, "The Rorschach Test of New Nuclear Powers: Analogies for North Korean Command and Control," *War on the Rocks*, October 6, 2017, available at: <https://warontherocks.com/2017/10/the-rorschach-test-of-new-nuclear-powers-analogies-for-north-korean-command-and-control/>.
- <sup>3</sup> Shane Smith, "North Korea's Strategic Culture and Its Evolving Nuclear Strategy," in Jeannie L. Johnson, et al. (eds.), *Crossing Nuclear Thresholds: Leveraging Sociocultural Insights into Nuclear Decision-making* (New York: Palgrave Macmillian, 2018), pp. 227–250.
- <sup>4</sup> For a discussion of the importance of a secure second strike, see Keir A. Lieber and Daryl G. Press, "The New Era of Counterforce: Technological Change and the Future of Nuclear Deterrence," *International Security*, Vol. 41, No. 4, 2017, pp. 9–49.
- <sup>5</sup> U.S. Department of Defense, 53rd Security Consultative Meeting Joint Communique, December 2, 2021.
- <sup>6</sup> For instance, see Jeffrey Lewis, "North Korea is Practicing for Nuclear War," *Foreign Policy*, March 9, 2017, available at: <https://foreignpolicy.com/2017/03/09/north-korea-is-practicing-for-nuclear-war/>.
- <sup>7</sup> David Arceneaux and Peter Feaver, "The Fulcrum of Fragility: Command and Control in Regional Nuclear Powers," in Scott D. Sagan and Vipin Narang (eds.), *The Fragile Balance of Terror: Deterrence in the New Nuclear Age* (Ithaca: Cornell University Press, forthcoming); and Peter D. Feaver, "Command and Control in Emerging Nuclear Nations," *International Security* 17, no. 3 (1992): 160–87.
- <sup>8</sup> Soo-Hyang Choi and Josh Smith, "Kim Jong Un observes missile test to boost nuclear capabilities," *Reuters*, April 16, 2022; Tong-Hyung Kim, "Kim warns N. Korea could 'preemptively' use nuclear weapons," *Associated Press*, April 20, 2022; and Tong-Hyung Kim, "N. Korea approves new front-line army duties amid tensions," *Associated Press*, June 24, 2022.
- <sup>9</sup> For instance, the Workers' Party of Korea released a report one day prior to the promulgation of the 2013 "Law on Consolidating Position of Nuclear Weapons State" directing the military to "perfect the war method and operation in the direction of raising the pivotal role of the nuclear armed forces in all aspects concerning the war deterrence and



the war strategy, and the nuclear armed forces should always round off the combat posture.” “Report on Plenary Meeting of WPK Central Committee,” *KCNA*, March 31, 2013.

- <sup>10</sup> Arceneaux and Feaver, “The Fulcrum of Fragility: Command and Control in Regional Nuclear Powers”; and Feaver, “Command and Control in Emerging Nuclear Nations.”
- <sup>11</sup> Smith, “North Korea’s Strategic Culture and Its Evolving Nuclear Strategy.”
- <sup>12</sup> U.S. Defense Intelligence Agency, *North Korea Military Power: A Growing Regional and Global Threat* (Washington, DC: U.S. Government Publishing Office, 2021), p. 18.
- <sup>13</sup> Scott D. Sagan, “The Origins of Military Doctrine and Command and Control Systems,” in Peter R. Lavoy, et. al. (eds.), *Planning the Unthinkable: How New Powers Will Use Nuclear, Biological, and Chemical Weapons* (Ithaca, NY: Cornell University Press, 2000), pp. 42–44.
- <sup>14</sup> Josh Smith, “Who has Kim Jong Un’s ‘nuclear button’ in Pyongyang while he’s away?,” *Reuters*, June 11, 2018.
- <sup>15</sup> This argument is also made in Jung H. Pak, “Why we shouldn’t rule out a woman as North Korea’s next leader,” *The Washington Post*, May 1, 2020.
- <sup>16</sup> Ryo Hinata-Yamaguchi, *Defense Planning and Readiness of North Korea: Armed to Rule* (NY: Routledge, 2021), p. 68.
- <sup>17</sup> Narang and Panda, “Command and Control in North Korea: What a Nuclear Launch Might Look Like.”
- <sup>18</sup> Herman Kahn, *On Thermonuclear War* (New Brunswick, NJ: Transaction Publishers, 2007), p. 308.
- <sup>19</sup> Walter Slocombe, “Preplanned Operations,” in Ashton B. Carter, John D. Steinbruner, and Charles A. Zraket (eds.), *Managing Nuclear Operations* (Washington, DC: The Brookings Institute, 1987), pp.122–123.
- <sup>20</sup> The 2018 Nuclear Posture Review states: “There is no scenario in which the Kim regime could employ nuclear weapons and survive.” U.S. Department of Defense, *Nuclear Posture Review*, February 2018, p. 33.
- <sup>21</sup> The 2019 U.S. *Missile Defense Review* states: “U.S. attack operations...will degrade, disrupt, or destroy an adversary’s missiles before they are launched.” See, U.S. Department of Defense, *Missile Defense Review*, 2019, p. XVI. ROK President Yoon Suk-yeol, as a candidate, stated: “there is currently no other option for preventing it besides a preemptive strike when signs [of a launch] are detected.” See, “Yoon says preemptive strike is only answer to N. Korea’s hypersonic missiles,” *Hankyoreh*, January 12, 2022.

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