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North Korea's Security Threats Reexamined

Coedited by

Hideya Kurata and Jerker Hellström

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March 2019

Center for Global Security, National Defense Academy
Yokosuka, Japan

CONTENTS

ACKNOWLEDGEMENTS		iv
INTRODUCTION		1
CHAPTER 1 Hideya Kurata	Kim Jong-un' s Nuclear Posture under Transformation: The Source of North Korea's Counterforce Compulsion	5
CHAPTER 2 Anders Lennartsson	Estimating Ballistic Missile Performance Based on Incomplete Information: Application to North Korea's 2016–2017 Missile Tests	19
CHAPTER 3 Sangmin Lee	Technical Assessment and Prospects on North Korean Nuclear Capability	32
CHAPTER 4 Jonathan Miller	Evaluating the US Approach to North Korean Threat under Trump Administration	40
CHAPTER 5 Hiroyasu Akutsu	North Korea's Evolving Strategy toward the United States: Kim Jong Un's New Buy-Time Tactic	51
CHAPTER 6 Kyengho Son	ROK's Perception of and Posture toward the DPRK's Nuclear and Ballistic Missile Development	63
CHAPTER 7 Sugio Takahashi	North Korea's Threat and Japan's Response	73
CHAPTER 8 Takeshi Watanabe	Japan-US-ROK Cooperation for Sustaining Deterrence	81
CHAPTER 9 Jerker Hellström	European Perspectives on North Korea's Nuclear and Ballistic Missile Programs	88
SEMINAR PROGRAM		101
CONTRIBUTORS AND PARTICIPANTS		103

GLOBAL SECURITY SEMINAR SERIES

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This volume is based on the working papers presented at the NDA-FOI Joint Seminar on "North Korea's Security Threats Reexamined" held on February 7, 2018. Most of the chapters are revised or up-dated to reflect the views expressed during the course of the seminar.

On behalf of GS an FOI, we would like to express our sincere appreciations not only to the contributors for their precious time and efforts in the process of this publication, but also to all those who attended the seminar and participated in the discussions. The views expressed in each of the chapters, however, strictly represent those of the respective authors, and so go the credits.

We hope the insights shared by the authors here invite a new round of discussion among readers. Comments and suggestions on our joint research project are more than welcome.

March 2019
Hideya Kurata and Jerker Hellström
Coeditors

INTRODUCTION

Hideya Kurata

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At least since its first nuclear test in 2006, North Korea's ambitions to develop nuclear capabilities and ballistic missiles have been regarded as one of the major threats to international security. In 2017, the Kim Jong-un regime tested more missiles in a single year than ever before and conducted its sixth nuclear test. Towards the end of the year, the Korea Central News Agency (KCNA) declared that North Korea had become a nuclear state.

These developments prompted international concerns, no least in the United States, which held military exercises with South Korea and continued the launch of the terminal high altitude area defense (THAAD) missile defense system south of Seoul. This, in turn prompted aggressive rhetoric and a "war of words" between Washington and Pyongyang. The latter also received political backing by China and Russia, which emphasized the concept of 'double suspension', by which the U.S. would reduce its military engagement in the region in exchange for a North Korean freeze of missile and nuclear tests.

This was the backdrop to a seminar convened in early 2018 by the Center for Global Security at the National Defense Academy (NDA) in Japan and the Swedish Defense Research Agency (FOI) to address North Korea's security threats. This publication is based on the papers presented at this joint seminar and the discussions they provoked. The chapters presented herein give various perspectives on the security challenges related to North Korea's missile and nuclear programs as seen by

Japanese, Swedish, South Korean and Canadian scholars.

In Chapter One, Hideya Kurata of NDA assesses the development of North Korea's nuclear posture. While North Korea has employed a nuclear no-first use and minimum deterrence doctrine, the regime has also issued statements that run counter to it. For example, it has not ruled out the possibility of conducting a 'nuclear preemptive strike'. He also examines North Korea's nuclear posture in comparison with evolving nuclear postures of both China and India.

In Chapter Two, Anders Lennartsson of FOI reviews North Korea's ballistic missile tests in 2016 and 2017. The chapter provides insights into the physics that determine the range of a ballistic missiles and analyzes the range capacity of North Korean missiles tested during this time period.

In Chapter Three, Sangmin Lee of the Korea Institute for Defense Analyses (KIDA) makes a technical assessment of North Korea's nuclear capability and discusses the prospects for its development. One conclusion is that North Korea is developing anti-ship ballistic missiles (ASBM) as tactical nuclear weapons, and that the Scud-ER, Rodong, and Polaris-1 and -2 missiles can become candidates for ASBMs. Moreover, due to limited progress in denuclearization talks with the United States, North Korea may return to nuclear development in the future.

In Chapter Four, Jonathan Berkshire Miller of the Japan Institute of International Affairs (JIIA) evaluates the United States' approach to North Korean threats during the Trump presidency. Berkshire Miller describes how the intensity of North Korea's missile program is making for very difficult strategic choices for United States and its allies which are looking to deter and defend against Pyongyang's bellicosity. He suggests that the United States should accelerate deterrence efforts and coordinate further with Japan and South Korea, also in regards to sanctions and diplomatic efforts.

In Chapter Five, Hiroyasu Akutsu of Japan's National Institute for Defense Studies (NIDS) examines North Korea's approach to the United States. Akutsu argues that North Korea has adopted a two-phased approach, namely taking advantage of South Korea's engagement policy, while also agreeing to a US offer for a summit meeting between Donald Trump and Kim Jong-un. Pyongyang's most immediate policy

priority appears to force the US into accepting North Korea's status as a *de facto* nuclear weapons state.

In Chapter Six, Kyengho Son of the Korea National Defense University (KNDU) discusses South Korean perceptions and responses in regard to North Korea's development of nuclear warheads and ballistic missiles. Son suggests that North Korea's nuclear weapons program may have two major purposes: as a tool for preserving the regime, and as a means to change the *status quo* on the Korean peninsula. In response to Pyongyang's ambitions, he proposes a range of strategic considerations and makes recommendations for South Korean policymakers to ponder.

In Chapter Seven, Sugio Takahashi of NIDS examines Japan's response to North Korean threats. Takahashi states that Japan has made multiple efforts against North Korea's nuclear escalation ladder. First and foremost, Japan has attempted to improve its credibility of extended deterrence by the United States. He asserts that Japan plays a critical role in coping with Korean Peninsula contingencies, whilst having virtually no direct military commitment. Moreover, Takahashi stresses that the effects of North Korea's strategic weapons must be neutralized in order to maintain regional peace and stability.

In Chapter Eight, Takeshi Watanabe of NIDS reviews the Japan-United States-South Korea trilateral cooperation for sustaining deterrence. Watanabe states that North Korea has significantly improved its power to coerce others and take advantage of the China-South Korea 'three no' policy, namely that Seoul is not to join the U.S. missile defense system, nor to develop the trilateral cooperation into a military alliance, or make an additional deployment of THAAD system. He asserts that the three powers must, in fact, improve their trilateral security cooperation for denuclearization negotiations and deterrence to be effective.

Finally, in Chapter Nine, Jerker Hellström of FOI discusses European perspectives on North Korea's Nuclear and Ballistic Missile Programs. Hellström argues that the Sino-Russian concept of 'double suspension' could lead to reducing tensions in North East Asia, which is one of the European Union's key interests in regards to security on the Korean peninsula. However, the concept also suggests a weakening of U.S. military engagement in East Asia. As a resolution of the North Korean nuclear issue

is not in the cards, Pyongyang's ambitions may provoke period of build-up of defensive and offensive capabilities, also beyond East Asia.

CHAPTER 1

Kim Jong-un's Nuclear Posture under Transformation: The Source of North Korea's Counterforce Compulsion

Hideya Kurata

National Defense Academy

INTRODUCTION

Given the comparative inferiority of nuclear and conventional forces *vis-à-vis* the US-ROK Combined Forces, the Democratic People's Republic of Korea's (DPRK: North Korea) choice of nuclear posture was originally limited. North Korea's emerging nuclear posture seems common to the Minimum Deterrence which some of nuclear subsequent countries; China and India, for example, are currently believed to adopt[1].

Under this posture, they make it clear not to provoke/challenge a nuclear war, pledging the No-First-Use (NFU) of the nuclear weapons. North Korea also adopts a similar position. Predicting the first nuclear test in October 2006, North Korea's Foreign Ministry released the statement declaring that North Korea will never use nuclear weapons first[2]. Under the NFU pledge, nuclear weapons are supposed to be used only for the second strikes in retaliation, thus inflicting intolerable retaliatory damages to adversaries are therefore regarded as sufficient to deter the preemptive the first strike. It constitutes countervalue attacks giving the priority to the explosiveness to kill the citizens in habitant cities of the adversaries.

Second-strike capabilities must survive despite a first attack undertaken by an adversary. Intercontinental Ballistic Missiles (ICBM) are concealed and dispersed

[1] Zafer Kahn, "North Korea's Evolving Nuclear Strategy under the Pretext of Minimum Deterrence: Implications for the Korean Peninsula", *International Journal of Korean Unification Studies,* Vol. 24, Issue 3, 2015.

[2] Hideya Kurata, "Formation and Evolution of Kim Jong Un's 'Nuclear Doctrine': The Current State of North Korea's 'Minimum Deterrence' in Comparison", *The Kim Jong Un Regime and the Future Security Environment Surrounding the Korean Peninsula*, Tokyo, The National Institute for Defense Studies, 2017, p. 43.

in silos underground or in mountains, charged on Transporter Erector Launcher (TEL) on the ground and or even underwater as Submarine Launched Ballistic Missile (SLBM). The second-strike capabilities are, moreover, required to be perpetual readiness, that is, they are capable of being launched immediately after suffering the first strike to threaten an adversary. The solid-fueled engines are preferred to liquid-fueled ones to shorten the time needed before launch.

With regards to survivability and readiness of the second-strike capabilities, North Korea has demonstrated remarkable progress. North Korea possesses short-range *Toksa (KN-02)* solid-fueled missiles. It applied these technologies to longer-range missiles, and conducted a ground test of a high-powered solid-fuel rocket engine and its cascade separation in March 2016. Kim Jong-un has stressed on the need to be able to make nuclear strikes from anywhere on the ground, in the air, at sea and underwater[3]. North Korea applied these technologies to the SLBM tests in April, July and August 2016.

However, while seeking Minimum Deterrence, North Korea recently engaged in rhetoric that ran counter to it. North Korea's official organs, for instance, stated to "nuclear preemptive strike" in 2013 and even Kim Jong-un referred to it as such in 2016. These are not the mere changes in rhetoric; North Korea's nuclear posture cannot be explained only by the 'Minimum Deterrence' when considering its ballistic missiles that it developed and tested recently[4].

This article begins with the brief examinations of the nuclear postures of China and India, paying attention to the NFU pledges and the force structure. The nuclear postures of these two countries are often compared as both countries seek to establish the Minimum Deterrence; that is making official pledges to NFU and pursuing the survivability and readiness of the second-strike capabilities. The determinants of North Korea's shift to counterforce ought to be examined in comparison with China and India. Following these analyses, this article will examine the achievements that North Korea made in 2017 in the realm of ballistic missile developments.

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[3] "경애하는 김정은동지께서 조선인민군의 전략군 탄도로케트발사훈련을 보시였다", *민주조선,* March 11, 2016.

[4] Kurata, "Formation and Evolution of Kim Jong Un's 'Nuclear Doctrine'", p. 47.

EXOTERIC NFU AND ESOTERIC FU?: SOURCES OF COUNTERFORCE COMPULSIONS IN COMPARISON

CHINA' COUNTERFORCE COMPULSION: LOCAL AIR-SUPERIORITY

Although China has retained the NFU pledge since its first nuclear test in October 1964[5], several remarks have been made by the affiliates within the People's Liberation Army (PLA) that conflict with the NFU pledge concerning with the Taiwan Strait and other security issues. Owing to the buildup of the conventional forces across the Strait in the 1990s, China came to be confident in its air-superiority across the Taiwan Strait in the early 2000s[6]. That is to say, China came to be convinced that 'liberation' of Taiwan was not impossible if the US would not intervene in the Taiwan Strait.

The arguments on the revision of the NFU came from among the ex-officers of the PLA and scholars, representing frustrations in some sectors in the PLA and those held by academics. Admittedly these arguments do not necessarily or specifically refer to the Taiwan issue, some of them contend that the possible first nuclear use might be effective to protect China's sovereignty and territorial unity, implying the Taiwan Strait[7]. China's self-imposed NFU pledge to eliminate one of the effective options for China to intimidate the US forces not to intervene to the Taiwan Strait threatening to use the nuclear weapons; the pledge works as the restraint on China's military operations. Against this backdrop, China was faced with the need to develop the ballistic missiles for counterforce targeting to deter US intervention[8].

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[5] 潘振強, "中国不首先使用核武器問題研究", 李彬・趙通主編, *理解中国核思維,* Beijing, Social Science Publications, 2015, pp. 48-49; 孙向丽, "中国核战略性质与特点分析", *世界経済与政治*, Issue 9, 2006; "中国是唯一宣布不首先使用核武器的国家", *中国新聞週刊,* April 19, 2010.

[6] Regarding the details of the unofficial remarks examining the NFU pledge and the reaction of the Chinese government, see Kurata, "Formation and Evolution of Kim Jong Un's 'Nuclear Doctrine'", pp. 44-46.

[7] Eric Heginbotham, *et al*, *China's Evolving Nuclear Deterrent: Major Drivers and Issues for the United States*, Santa Monica: RAND Cooperation, 2017, pp. 130-131. Regarding the cases in which China might revise the NFU pledge, China is reported in early 2000 to assume to drown millions of Chinese citizens by destroying the Three Gorges Dam. Jeffery G. Lewis, *Paper Tigers: China's Nuclear Posture*, London, International Institute of Security Studies, 2014, p. 31.

[8] *The Science of Second Artillery Campaigns* (*中国人民解放军2 砲兵战役学*) , the internal document in the PLA's Second Artillery is said to stipulate the waves of nuclear attacks to the military objects of the adversary. M. Taylor Fravel and Evan S. Medeiros, "China's Search for Assured Retaliation: The Evolution of Chinese Nuclear Strategy and Force Structure", *International Security*, Vol. 30, No. 4, Spring 2006.

Counterforce capabilities require high accuracy, flexible yield, and prompt delivery by the technological advance[9]. The counterforce capabilities to the US Naval and Air Force Bases including the Seventh Fleet's homeport Yokosuka and Kadena Air Force Base (AFB) in Okinawa are intended to negate US access to the Taiwan Strait[10]. High explosive force, even at a distance target like Yokosuka or Kadena is only assured when a missile mounts a nuclear warhead.

Whilst China's nuclear first use vis-à-vis Japanese soil conflicts with the NFU pledge, it runs counter to another self-imposed pledge of Negative Security Assurance (NSA): assurance not to use or threaten to use nuclear weapons against non-nuclear weapon states (NNWS). The argument is said to contend that a country that is allied with an NWS, houses nuclear weapons, or provides basing for a nuclear adversary should not be regarded as an NNWS[11]. This reminds the 'Warsaw-Pact Exclusion Clause' that the rest of the NWS had retained to allow themselves to make the first nuclear strike to the NNWS if they were associated with another NWS, by which they could deter use of nuclear weapons by another NWS.

The notable example of such counterforce capabilities would be the *Dongfeng-21* (CSS-5): a surface-to-surface Medium-range Ballistic Missile (MRBM) converted from the SLBM *Julang-1* (CSS-N-35) with a range of approximately over 1700 km. These ballistic missiles are intended to negate the US Seventh Fleet intervening in the Taiwan Strait; thus constituting China's Anti-access/Area-denial (A2/AD) strategy. Likewise, re-examination of the NFU entails the development of the counterforce capabilities and *vice versa*. The strategic change is often considered as a shift to limited nuclear deterrence, providing greater flexibility in the use of nuclear weapons than the countervalue punitive second strikes used under the 'Minimum Deterrence' Strategy[12].

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[9] Keir A. Lieber and Daryl G. Press, "The New Era of Nuclear Weapons, Deterrence, and Conflict", *Strategic Studies Quarterly,* Vol. 7, No. 1, Spring 2013, p. 7.

[10] Thomas Shugart and Javier Gonzalez, *First Strike: China´s Missile Threat to US Bases in Asia*, Washington DC, Center for a New American Security, 2017.

[11] Heginbotham, *China's Evolving Nuclear Deterrent,* p. 131.

[12] Paul H. B. Godwin, "PLA Doctrine and Strategy: Mutual Apprehension in Sino-American Military Planning", Stephen J. Flanagan and Michael E. Marti eds., *The People's Liberation Army and China in Transition*, Washington DC, Institute for National Strategic Studies, National Defense University, 2003. pp. 274-275.

INDIA'S COUNTERFORCE COMPULSION: ADVERSARY'S DEVELOPMENT OF SRBM

Admittedly, unlike China, India is not a legitimate NWS, India's official nuclear doctrine is officially known as the 'Credible Minimum Deterrence' as India propounded this nuclear posture the Nuclear Doctrine under the Bhāratīya Janatā Party (BJP) Vajpayee administration in January 2003. However, it manages to retain the 'calculated ambiguity': the room for nuclear use in retaliation for the adversary's bio/chemical weapons attacks. The NFU pledge in conjunction with the massive countervalue assured retaliation is supposed to be the major component of India's nuclear doctrine[13]. After the subsequent Indian National Congress (INC) administration, Modi, the head of BJP, declared India would retain the NFU pledge even after his taking office in the election campaign in 2014 despite the BJP's commitment to revision of the nuclear doctrine[14].

Controversies erupted because of Pakistan's alleged support of terrorist attacks, notably on India's national assembly in December 2001. Being convinced that the terrorist attacks emanated from Pakistan, India is reported to have created the 'Cold Start Doctrine', which authorizes mobilization of its army to conduct punitive and proportionate retaliation with conventional weapons[15]. India, however, failed to take retaliatory measures in response to the alleged Pakistan-sponsored terrorist attack at Mumbai in November 2008.

India was further challenged by Pakistan's attempt to deploy the Short-range Ballistic Missiles (SRBM) *Nasr*/*Hatf-IX,* under the banner of the 'full-spectrum deterrence', of which estimated range is approximately 60 km[16]. It was obvious that Pakistan had attempted to deter the limited conventional retaliatory strike of

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[13] "Press Release: Cabinet Committee of Security Reviews Progress in Operationalizing I ndia's Nuclear Doctrine, 4th January 2003". https://mea.gov.in/press-releases.htm?dtl/20131/The_Cabinet_Committee_on_Security_Reviews_perationalization_of_Indias_Nuclear_Doctrine+Report+of+National+Security+Advisory+Board+on+Indian+Nuclear+Doctrine

[14] "Modi Rules out BJP's Will to Revise 'No-First-Use' of Nukes' Policy", Reuters, April 16, 2014. https://www.dawn.com/news/1100300/modi-rules-out-bjps-will-to-revise-no-first-use-of-nukes-policy

[15] Walter C. Ladwig III, "A Cold Start for Hot Wars? The Indian Army's New Limited War Doctrine", *International Security,* Vol. 32, No. 3, Winter 2007/2008.

[16] Arun Vishwanathan, "Pakistan's *Nasr*/*Hatf-IX* Missile: Challenges for Indo-Pak Deterrence", *Strategic Analysis*, Volume 38, Issue 4, July 2014; Arka Bismas, "Pakistan's Tactical Nuclear Weapons: Deconstructing India's Doctrinal Response", *Strategic Analysis*, Volume 39, Issue 4, November 2015.

the 'Cold Start Doctrine', offsetting their inferiority in conventional forces and lowering the nuclear threshold *via-a-vis* India. By deploying the SRBM, Pakistan attempted to make India fall into the 'commitment trap' Sagan argued[17]. India officially still retains the 'Minimum Deterrence' and is prepared to make massive countervalue retaliations while pledging the NFU. The massive countervalue retaliation, however, is no doubt disproportionate to the nuclear strike by the SRBMs. India, when attacked by Pakistan's nuclear SRBM, must make the choice whether it conducts a massive nuclear retaliation or conventional retaliations. The credibility of India's nuclear deterrence could not avoid being undermined in case India chooses the latter[18].

It would not be surprising if India were tempted to develop the nuclear counterforce capabilities to make the proportionate retaliations to Pakistan's nuclear SRBM strikes. Moreover, India's must suffer at least one Pakistan's nuclear SRBM strike before the massive countervalue retaliations can be put into play according to India's own doctrine on this. This dilemma may imply the need for India to build counterforce capabilities to neutralize Pakistan's nuclear SRBM, leading to the idea that India should cancel its self-imposed NFU pledge. As seen in China's case earlier, the re-examination of the NFU pledge facilitates the shift to the counterforce capabilities, and *vice versa.*

Narang has argued that the controversies were in fact a means to provoke, albeit indirectly, a re-examination of India's declared NFU, thereby allowing room for first use of nuclear weapons in India. Quoting the former National Security Adviser, Menon, he argued that India's initiation of preemptive nuclear use was possible if it detected Pakistan moving tactical nuclear weapon batteries into the theater of battle[19]. Menon also stated that Pakistan's possession of the SRBM prevented India

[17] Scott D. Sagan, "The Commitment Trap: Why the United States Should Not Use Nuclear Threats to Deter Biological and Chemical Weapons Attacks", *International Security*, Vol. 24, No. 4, Spring 2000.
[18] Arka Biswas, "Incredibility of India's Massive Retaliation: An Appraisal on Capability, Cost, and Intention", *Comparative Strategy,* Volume 36, Issue 5, 2017.
[19] *Policy Conference*, Washington DC, March 20, 2017 (Remarks as Prepared, not as Delivered).

from retaliating by massive conventional weapon[20]. Based upon Menon's statement Narang argued these controversies might pave a way for India to go from the singular nuclear posture for both China and Pakistan and to 'decouple' it from China and align it differently toward Pakistan[21]. Namely, while retaining the 'Credible Minimum Deterrence' for China, leaving a room the first use of nuclear weapons as the proportionate strikes against Pakistan concurrently.

Even in the case of India where cancels its NFU pledge and deploys tactical counterforce capabilities following Pakistan, there is no assurance that the limited war will not develop into a total war[22]. In so far as India does not escalate the situation from tactical war to total war to end the war in India's favor, the 'Credible Minimum Deterrence' is supposed to require no review[23]. However, the recent controversies over the NFU in India show that Pakistan's deployment of the SRBM ignited it, challenging the effectiveness of the 'Credible Minimum Deterrence'.

DETERMINANTS OF NORTH KOREA'S COUNTERFORCE STRATEGY

PERCEIVED US OPERATIONS IN WAR-TIME

Whilst North Korea retains Minimum Deterrence by pledging the NFU and building the countervalue second-strike capabilities for survivability and readiness, it began to seek a different nuclear posture in the mid-2010s. It is motivated by drafting military operations to de-escalate and contain any potential war within the Peninsula, by preventing use of the US forces' bases located outside the Korean

[20] Narang's quotation of the Menon's sentence is as follows; "There is potential gray area as to when India would use nuclear weapon first against another NWS. Circumstances are conceivable in which India might find it useful to strike first, for instance, against an NWS that had declared it would certainly use its weapons, and if India were certain that adversary's launch was imminent" (Shivshankar Menon, *Choices: Inside the Making of India's Foreign Policy*, Washington DC, Brookings Institution's Press, 2016, p. 110). Menon also stated that Pakistan's possession of the SRBM prevented India from retaliating by massive conventional weapons, *(Ibid.*, pp. 115-116). Besides Menon, regarding the recent controversies over the NFU in India, Kumar Sundaram and M. V. Ramana, "India and the Policy of No First Use of Nuclear Weapons", *Journal of Peace and Nuclear Disarmament*, Volume 1, Issue 1, 2018, pp.10-11.

[21] *Policy Conference.*

[22] 栗田真広, "インドの核ドクトリンにおける先制核攻撃オプションの可能性", *国際安全保障*, 第 45 巻, 第 4 号, 2018 年 3 月, p. 66.

[23] Yusuf Unjhawala, "India Is Not Moving to Counterforce Doctrine" http://www.livemint.com/Opinion/Xgg3LgQFFB0U40hB2oH7rO/India-is-not-moving-to-counterforce-doctrine.html; Arun Sahgal, "India's Nuclear Doctrine is Robust and Requires No Review", *DPG Policy Note*, Vol. II, Issue 3, March 2017.

Peninsula.

At that time, Kim Jong-un underlined in — the Enlarged Meeting of the Central Military Commission the Worker's Party of Korea (WPK) of February 2015 — that the KPA should be prepared to react to any form of war ignited by the "US imperialists" and he is reported to have clarified the methods of fighting a war with the US and corresponding operational and tactical matters[24]. The hypothetical war in question would not be imagined to be the legally renewed war. The war, ignited either by the US or by North Korea, will develop into armed attacks to the UN Command, doubling the US-ROK Combined Command and the US Forces Command in Seoul. It would also serve to justify the interpretation that the war is the resumption of the Korean War; when at least six US bases designated as the UN bases are to be possibly mobilized as the Korean War was fought by. Moreover, the US strategic bombers — B-1Bs, B-2s and B-52s deployed on the rotation-basis at Andersen Air Force Base (AFB) in Guam — are supposed to be ready to launch the air strikes against North Korea when armed conflict commences, as well as the Seventh fleet being dispatched under the Pacific Command (PACOM)'s operation.

North Korea must demonstrate its will to escalate the war to deter the US from intervening on the Korean Peninsula. The measures deployed to deter the US from using the bases outside the Korean Peninsula for staging and bombing North Korea will be different from those to deter the local US-ROK Combined Forces. The greater the distance the missiles travel, the less explosiveness the conventional warheads tipped on them yield; conventional warheads do not, therefore, constitute deterrence to these distant targets.

The countervalue retaliation to deter the US first strike depleting all the nuclear forces would not be enough to deter the US not to use the bases outside the Korean Peninsula to stage and bomb North Korea. Counterforce capabilities are thus needed for North Korea to target the specific US bases with flexible nuclear yields. North Korea needs the counterforce IRBMs whose range covers the US bases in the Asia-Pacific as well as countervalue ICBMs to hit the US continent for the countervalue strikes to have any real weight in terms of legitimate deterrence.

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24 "조선로동당중앙군사위원회회장이신 경애하는 김정은동지 지도밑에 조선로동당중앙군사위원회 확대회의가 진행되였다", *로동신문,* February 23, 2015.

CONFLICTING REMARKS ON NUCLEAR USE

China as well as India officially retains the NFU pledge even in spite of the repeated unofficial remarks claiming the potential first use of nuclear weapons. In contrast, Kim Jong-un's remarks regarding use of nuclear weapons are dubious and even contradictory.

If the US forces conduct combat actions on the Korean Peninsula from bases outside the Korean Peninsula, despite North Korea's threatening a nuclear response, North Korea evidently could not tolerate the US bombings without any form of retaliation. In a case where the US conducts conventional bombing by the nuclear-incapable B-1B strategic bombers, and North Korea's retaliation then includes nuclear counter-attacks, it results in North Korea using nuclear weapons first.

In this regard, Kim Jong-un's address at the meeting of the Central Committee of the WPK on March 31, 2013 is worth noting. He stated, while proposing the 'Parallel Line' of simultaneously pursuing nuclear and economic developments, that "the People's Army should 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* (emphasis added)[25].

The 'war deterrence' strategy is supposed to be tantamount to be the Minimum Deterrence, the key components of which are the NFU pledge and survivability of second-strike capability readiness. The 'war strategy', on the other hand, can be interpreted as the strategy to be taken when it is judged that a war is inevitable. The 'combat posture' that Kim Jong-un referred then is not restricted by either the NFU pledge or by the countervalue second-strike.

Afterwards, the Supreme People's Assembly (SPA) adopted the Ordinance 'On Consolidating the Position of Nuclear Weapons State for Self-Defense'. Article 4 of the Ordinance states that '"the nuclear weapons of the DPRK can be used only by a final order of the Supreme Commander of the Korean People's Army to repel invasion or attack from a hostile nuclear weapons state and make retaliatory strikes."

[25] "경애하는 김정은동지께서 조선로동당 중앙위원회 2013 년 3 월전원회의에서 하신 보고", *로동신문*, April 2, 2013.

Though it assumes 'a hostile nuclear weapons state' as the subject that makes an 'invasion or attack', it does not limit the means of that invasion or attack to nuclear weapons. This provision of the ordinance therefore indicates the possibility of North Korea repelling an attack by 'a hostile nuclear weapons state' using conventional forces by use of nuclear weapons. Thus, the provision cannot be regarded as NFU, rather it leaves room for nuclear first use[26].

Regarding the NFU, it is also worth noting that Kim Jong-un referred to the literal NFU in his address to the Seventh Congress of the WPK in May 2016. He said, "Our Republic will not use a nuclear weapon unless its sovereignty is encroached upon by any aggressive hostile forces *with nukes* (emphasis added) [27]. Unlike the Ordinance adopted by the SPA, Kim Jong-un confined the measures for 'hostile forces' to 'encroach' the North Korea's sovereignty to "nukes".

On the contrary, one month later, Kim Jong-un stated that it was necessary to increase in a sustained way our preemptive nuclear attack capability on the successful test-fire of the Intermediate-range Ballistic Missile (IRBM) *Hwasung-10 (Musudan)*, after the repeated failures on June 23[28]. Kim Jong-un's contradictory remarks on nuclear use correspond to the 'war deterrence' and 'war strategy' that he propounded himself.

THE SHIFT TO COUNTERFORCE

North Korea's possible nuclear first use is coupled with its efforts to develop its deterrence into counterforce capabilities via the 'war strategy', contrasted to the second-strike countervalue capabilities known as the 'war deterrence'. As counterforce capabilities are incorporated in military operations, precision attacks are highly required. It is symbolic, seen in this light, that the commentary of North Korea's official organ first enunciating the first use of nuclear weapons referred to

[26] "조선민주주의인민공화국 최고인민회의 법령 자위적 핵보유국의 지위를 더욱 공고히 할 데 대하여", *민주조선,* April 2, 2013. For the further details of North Korea's nuclear doctrine, see Kurata, The Current State of North Korea's 'Minimum Deterrence' in Comparison, pp. 39-43.
[27] "조선로동당제 1 비서이신 경애하는 김정은동지께서는 조선로동당 제 7 차대회에서 한 당중앙위원회 사업총화보고", *로동신문,* May 8, 2016.
[28] "조선의 국방력 일대과시 지상대지상중장거리전략탄도로케트《화성-10》시험발사에서 성공 처경애하는 김정은동지께서 지상대지상중장거리전략탄도로케트《화성-10》시험발사를 현지에서 지도하시였다", *민주조선,* June 23, 2016.

the 'precision nuclear attack' concurrently[29].

Going back to February 2015, the Political Bureau of the Central Committee of the WPK adopted the resolution stipulating that they would display the manufacture of 'a large number of powerful, cutting-edge military hardware of our own style that are of *high precision*, light, unmanned and intelligent [30] (emphasis added). Furthermore in 2016, Kim Jong-un was reported to have given authorization for the research and development of Korean-style ballistic rockets with high precision capable of "attacking the arbitrary specific targets on the sea and the ground like enemy's fleets as if reeving them through the eye of a needle[31]".

In this context, *Hwasung-10*'s test-fire in June 2016 should be noted again. Its effective range is estimated to be 2000-4000 km, allowing it to reach Guam. A few days before the test-fire, North Korea's National Defense Commission Spokesman labelled Andersen Air Force Base as "a logistic base for invading the DPRK", hinting at nuclear first-use. The missile could be characterized as a counterforce weapon against Andersen AFB in Guam[32]. A couple of days later, Kim Jong-un was reported to clarify that the Strategic Force of the KPA had developed it into a powerful service equipped with miniaturized and high-precision nuclear strike means[33]. In case North Korea attempts to test-fire the counterforce ballistic missiles covering the US Forces in Japan as well as Andersen AFB in Guam, it must be fired in an east and southeast direction.

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[29] "우리식의 정밀핵타격으로 미제와 괴뢰역적패당을 쓸어버리자", 조선중앙통신, Pyongyang, March 6, 2013. http://www.kcna.co.jp

[30] "조선로동당 중앙위원회정치국 결정서《조선로동당창건 일흔돐과 조국해방 일흔돐을 위대한 당의 령도따라 강성번영하는 선군조선의 혁명적대경사로 맞이할데 대하여》를 채택",*로동신문,* February 13, 2015.

[31] "경애하는 최고령도자 김정은동지께서 정밀조종유도체계를 도입한 탄도로케트시험발사를 지도하시였다", *민주조선,* May 30, 2017. The instruction's exact date is not identified.

[32] Hideya Kurata, "North Korea's Nuclear Weapon Capabilities: Emerging Escalation Ladder", *CSCAP Regional Security Outlook,* Canberra, Council for Security Cooperation in the Asia Pacific, 2017, p. 35.

[33] The remarks of Kim Jong-un were made on the occasion that the SPA designated July 3rd as the anniversary of the foundation of the Strategic Forces of the KPA in commemoration of the day 1999 when Kim Jong-il founded the Strategic Rocket Forces. "조선민주주의인민공화국 최고인민회의정령 1177 호 조선민주주의인민공화국전략군절을 제정함에 대하여", *민주조선,* June 26, 2016.

DEMONSTRATED COUNTERFORCE CAPABILITIES: ACHIEVEMENTS[34]

2017 may be marked as the year when North Korea accomplished and demonstrated its counterforce capabilities with the ballistic missiles. On February 13, North Korea test-fired a ground-to-ground medium-to-long range strategic ballistic missile called *Pukguksong-2 (KN-15),* and it again fired the same type of ballistic missiles on May 21, 2017. Its range is estimated at more than 2000 km, was originally developed as SLBM. It was tested in May and August 2017 with success. Kim Jong-un was reported to say with pride that the missile's hit rate was very accurate. It should be noted that he stated its tactical and technical data met the requirements of the Party[35]. It indicates that the accuracy of targeting was directed by the WPK.

In early March, North Korea, in the drill, fired *Scud-Extended Ranges (ER)s (KN-05),* of whose is estimated at approximately 1000 km, shorter range than that of *Hwasung-7 (Nodong)* and *Paektusan (Taepodong) -1,* the countervalue ballistic missiles. Their coverages do not extend to the major cities of Japan, Tokyo and Osaka. As the official organ reported the task of the *Hwasong* artillery units of the KPA Strategic Force involved in this drill was to 'strike the bases of the U.S. imperialist aggressor forces in Japan in contingency'. The targets of the *Scud ER*s are the US naval base in Sasebo and the Marine Corps base in Iwakuni; that is, those mobilized in the Korean War. *Scud ER*s are regarded as the counterforce weapons needed to deter US from using US bases in Japan in the case of contingency. Kim Jong-un was reported to have given the officials accompanying him the task to "continuously develop Korean-style *ultra-precision* and intellectually promoted rockets and bolster them in quality and quantity[36]". The memorandum released by the Foreign Ministry also underlined its efforts to develop its ballistic missiles for counterforce purposes saying "the DPRK's mode of attack, once launched, would be the precision strike to destroy only the military bases of the US and its vassal forces targeting the DPRK[37]".

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34 For the further details of this section, see 倉田秀也「北朝鮮の核態勢と対価値・対兵力攻撃能力――弾道ミサイル開発の二系列」平成 29 年度外務省外交・安全保障調査研究事業『*不確実性の時代』の朝鮮半島と日本の外交・安全保障*, Japan Institute of International Affairs, March, 2018.

35 "국가핵무력강화의 길에 울려퍼진 다발적.련발적 뢰성 지상대지상중장거리전략탄도탄《북극성-2》형 시험발사에서 또다시 성공 경애하는 최고령도자 김정은동지께서 탄도탄시험발사를 참관하시였다", *민주조선,* May 23, 2017.

36 "경애하는 최고령도자 김정은동지께서 조선인민군 전략군 화성포병부대들의 탄도로케트발사훈련을 지도하시였다", *민주조선,* March 7, 2017.

37 "미국의 반공화국 전쟁책동과 우리의 선택: 조선민주주의인민공화국외무성 비망록", *민주조선,*

In mid-May 2017, *Hwasung-12 (KN-17)* whose range is estimated at 3000-5000 km was test-fired. The rocket accurately hit the targeted open waters 787 km away after flying to the maximum altitude of 2111.5 km along its planned flight orbit[38]. *Hwasung-12* was not merely a pathway to the ICBM. Subsequently in August, the statement released by General Kim Rak-gyom, Commander of the Strategic Force of the KPA, noticed that it seriously examined the plan for an 'enveloping strike' at Guam through simultaneous fire of four *Hwasong-12* crossing the sky above Shimane, Hiroshima and Kochi prefectures of Japan flying 3356.7 km for 1065 seconds, hitting the waters 30-40 km away from Guam[39]. *Hwasong-12* is, therefore, the manifest to be the counterforce to Andersen AFB serving to deter the US from using its base for bombing to Korea, showing its will to escalate the war for de-escalating the battle when a war occurs on the Korean Peninsula.

CONCLUSION: DUALITY OF NORTH KOREA'S NUCLEAR POSTURE

As seen in China and India's cases, even if unofficial controversies are underway over the self-imposed NFU, the governments of these two countries officially defy them. In contrast, North Korea's leadership pledges the NFU while asserting the 'preemptive first nuclear strike'. As the declaratory policy, North Korea's nuclear posture embodies a contradictory duality. It is also seen in its armed forces structure. While developing the countervalue nuclear capabilities to strike the habitant cities in the US mainland, North Korea also shifted to building counterforce nuclear capabilities against the US bases outside the Korean Peninsula, and which were largely achieved in 2017.

This duality corresponds to the each of the two strategies; the 'war deterrence' and the 'war strategy' that Kim Jong-un propounded in his address in 2013. The set of the NFU pledge and the countervalue capabilities constitutes the 'war deterrence' strategy tantamount to 'Minimum Deterrence'; does the set of the 'preemptive first nuclear strike' menace and the counterforce capabilities constitute 'war strategy'.

April 7, 2017.

[38] "주체적 핵강국건설사에 특기할 위대한 사변 경애하는 김정은동지께서 새형의 로케트시험발사를 현지에서 지도하시였다", *민주조선,* May 16, 2017; see also 김보미, "북한의 핵선제불사용 (No First Use) 선언의 배경과 의미", *전략연구,* Vol. 23, Issue 3, November 2016, p. 61.

[39] "우리는 실제적 군사행동으로 미국에 엄중한 경고를 보낼 것이다--조선인민군전략군사령관 김락겸대장의 발표", *민주조선,* August 10, 2017.

Latter strategy, as shown in China and India's cases, addresses reexamination of the NFU, also entails the development of the counterforce capabilities.

However, North Korea's 'preemptive first nuclear strike' menace and the shift to counterforce strategy are not motivated, unlike China's case, by the buildup of its owns conventional forces: that is the local air superiority in conventional forces over the conflicted area. Nor are they motivated, unlike India's case, by the adversary's deployment of the tactical nuclear weapons and resultant lowering threshold of use of the nuclear forces. North Korea's shift to counterforce does *not* rest on the military buildup of its own or adversary, rather it rests on the perceived US bases mobilization that remains unchanged since the Cold War. It does also rest on the escalation ladder; demonstrating the will to escalate the conflict even with nuclear weapons to de-escalate the conflict by deterring use of US bases outside the Korean Peninsula for staging and bombing.

CHAPTER 2

Estimating Ballistic Missile Performance Based on Incomplete Information: Application to North Korea's 2016–2017 Missile Tests

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INTRODUCTION

Ballistic missiles are vehicles for delivering weapons quickly over a large range of distances, depending of course on the range of a particular missile. High speed and the fact that warheads are traveling at very high altitudes, often above the atmosphere, means they are difficult to defend against. From a military perspective, these advantages are further improved by a short time from firing decision to missiles being deployed, although this depends both on the type of missile and how forces are organized to tend to the missiles.

The intention of this paper is to provide some insights into the physics that determines the range of a ballistic missile, and in particular how various incomplete observations of a ballistic missile test give clues as to its actual performance when it comes to range. Equipped with these relations, an analysis of the range capacity of North Korea's missiles is performed, based on information available in news media about the country's tests during 2016–2017.

A BALLISTIC MISSILE SHOT

Ballistic missiles function by accelerating their payload, that is, one or more warheads, by accelerating them in a carefully controlled direction by the propulsive forces from one or more rocket stages, each propelled by one or more either solid propellant rocket motors or liquid propellant rocket engines. For each of the stages, as propellant is expelled, the remainder of the missile becomes lighter, and the acceleration increases as the propulsive force is often relatively constant for

each stage. Between each stage a short time is needed to separate the burned-out stage and to ignite the next stage when the conditions for doing so are met. When the last stage shuts down, the payload free-falls toward the target position, or positions in the case of multiple warheads.

The payload in the form of single or multiple warheads typically separates from the rest of the missile before reentry, although some short-range missiles have a nonseparating warhead. For example, some early Scud missiles do not have separating warheads. However, we shall only consider the case with a single separating warhead. To hit a specific target over the long distances a long-range missile can fly, means accurately hitting a point in four dimensions. In addition to the three spatial coordinates, there is time, as also targets such as a cities or missile silos are moving because of the rotation of the Earth. As the probability of hitting the target by chance at a distance of several thousand kilometers is very slim, a guidance and control system is necessary for any kind of precision. In fact, for precision strikes against military hardened targets, highly accurate guidance and control systems are fundamental to obtain destruction with any type of warhead. This also highlights the importance of information about the target location and why mobility has such high relevance for military forces, as it makes it increasingly difficult to strike the intended target.

Equipment for navigation and control is often placed in the very last stage, sometimes called the bus, which sometimes has a capacity for fine-tuning the velocity of the warhead before releasing it toward the coordinates of the target, in order to increase accuracy. Moving toward the target, the final part of the free fall is gradually turned into the reentry when the warhead is coming into the atmosphere and meets an increasing density of air molecules. As its velocity is very high, several kilometers per second, and increasing as it is exchanging potential energy for kinetic energy, the warhead, or reentry vehicle, is subjected to severe forces from the atmosphere. An object entering a gas with such a high velocity compresses the oncoming gases and by doing so increases their temperature. For medium- and long-range missiles, the velocity is so high and the compression so intense that the gas molecules are ripped apart and some electrons escape their host atom or molecule. It is thus a very hot ionized gas that surrounds the reentry vehicle. Energy left behind the warhead in the form of moving hot gases and an expanding shock wave, is the result of the work done by the warhead on the

surrounding gas, and corresponds to a drag force on the warhead. This drag force results in a reduction of velocity of the warhead, that is, an acceleration opposite the velocity, which is often many times the normal gravitational acceleration on the Earth. A functioning warhead, including the internal devices, needs to be able to withstand such accelerations. In addition, most parts of the missile, including the warhead(s) must be able to cope with strong vibrations during the ascent when the rocket motors are thrusting the missile to higher speeds. For a warhead, this also applies during the reentry phase, as vibrations manifest themselves in addition to the large decelerating forces and intense heat loads that are a result of atmospheric drag during reentry.

The forces on a warhead during reentry also impact its accuracy. The higher the forces, the more the accuracy is decreased. More on this in section for Balllistic Missile Accuracy.

INFORMATION ABOUT MISSILE TESTS

A thorough analysis of a missile test would require lots of quantitative information about the missile, its components, and their performance. Some examples of such information are what type of fuel is used in the various stages, the empty weight of each stage, the fuel mass for each stage, the mass of the final payload, the shape and size of the expansion nozzles for each rocket motor or engine, and the aerodynamic characteristics of the various flight configurations of the missile. Other examples are the test objectives, how the control system is functioning, and the control system parameter values that are used for the test, position, and velocity measurements, temperature measurements at various stations in the missile, and so on. With such a large set of information it would be possible to make realistic simulations of a particular test and answer questions regarding how the test could have gone relative to what actually happened. In fact, such analysis would probably be done while planning a test, so that it would be reasonably expected that the tests would reveal information vital to answering outstanding engineering questions.

Rarely are so many parameters available for the bystander, however, be it for tests by any country. Thus analysts have to use what is available. For many of North Korea's ballistic missile tests during 2016 and 2017, the available information has been limited to some photographs of the launching missile, occasionally a video of

the event, and some measurements of the distance flown, maximum altitude, and time of flight. So what insights can be derived from these numbers?

First, it should be noted that without any information on the payload of the tested missile, it is very difficult to assess actual performance data accurately. This is so because the payload mass has a significant influence on the range performance of a missile. If a missile is tested with a payload mass that differs drastically from what would actually be used, the results will still mean a lot to those who conducted the test, but not so much for outsiders without the full picture. We shall assume that the tests have been performed with a realistic payload mass on board.

From measurements in pictures, estimates of the size of the missile can be obtained. With added knowledge, and some assumptions, on how much such a structure would weigh and how much fuel there is room for, and calculations or even simulations for how much velocity such a missile would gain when boosting, it is possible to get an estimate of the missile's performance. Depending on the quality of the assumptions, there would be some margin for error.

Another approach is to look at the obtained orbit and see what range can be obtained with the same specific orbital energy. This is based on the assumption that a tested missile can insert a warhead in any orbit without difference as to the resulting specific energy of the warhead. This is not strictly true as during the boost for a highly lofted orbit, the gravity drag is higher than when boosting for a maximum range orbit (minimum energy trajectory) or a depressed orbit. However, the losses due to aerodynamic drag are smaller during a near vertical launch, compared to a long-range launch, which often starts at quite a low angle above the horizon. However, the differences in aerodynamic drag do not make up completely for increased gravity drag loss during a near vertical launch.

RANGE CALCULATIONS FOR BALLISTIC MISSILES

ORBITS IN GENERAL

Before going into the analysis of orbits based on limited information, we briefly revisit some facts about astrodynamics and orbits in general.

Astrodynamical orbits for objects free-falling around a large massive object such as a planet, are sections of a cone, that is, circles, ellipses, parabolas, or hyperbolas. The mass center of the Earth is in one of the foci points of the cone section. As long as the engines are accelerating a ballistic missile, it is not following a single well-predictable orbit; instead, the control system is functioning to navigate the missile to a point where it can insert the missile's warhead into such an orbit. While space probes move on hyperbolic orbits away from Earth, and satellites move on ellipses (sometimes circles) that do not intersect the shape of the Earth, warhead orbits are almost exclusively ellipses that intersect the Earth. The general idea is to construct warhead orbit ellipses so that the target passes through the intersection point of the Earth's surface and the orbit, at the same time the warhead arrives along its orbit. However, the last part representing the reentry has to be specially considered as it is not a section of an ellipse.

For a given missile with a specific payload mass, there is a maximum range. This range manifests itself as a single orbit between the start point and the target point. So for a predetermined launch position and a particular target on the range limit, the actual orbit flown by the missile, including the free-falling section of the warhead where there is no propulsion, is very close to a computable orbit, which is a section of an orbital ellipse through the location where the last engine is shut down, and the location where the reentry begins. This orbit is called a *minimum energy trajectory*. When a missile is directed to fly toward a target closer than its maximum range, there are essentially two procedures that can be followed. One is that the thrusting motor or engine is shut down at a point where the velocity has a magnitude and direction by which the released warhead will fall on a minimum energy trajectory toward the target. The other procedure is that the excess energy is used to accelerate the warhead to a higher-than-necessary velocity for reaching the target. This excess velocity can either be used to send the warhead on a lofted trajectory where the extra energy is used to reach a higher altitude at the expense of increasing time to target, or on a lower depressed orbit where the extra energy is used to increase the speed above the ground and have the warhead arrive sooner than it would on a minimum energy trajectory. Two such orbits are shown in Figure 1. This is all relevant as North Korea has used very lofted trajectories to test its missiles in the past year or so. The tricky question is, of course, what range the energy of such a lofted trajectory can be converted into.

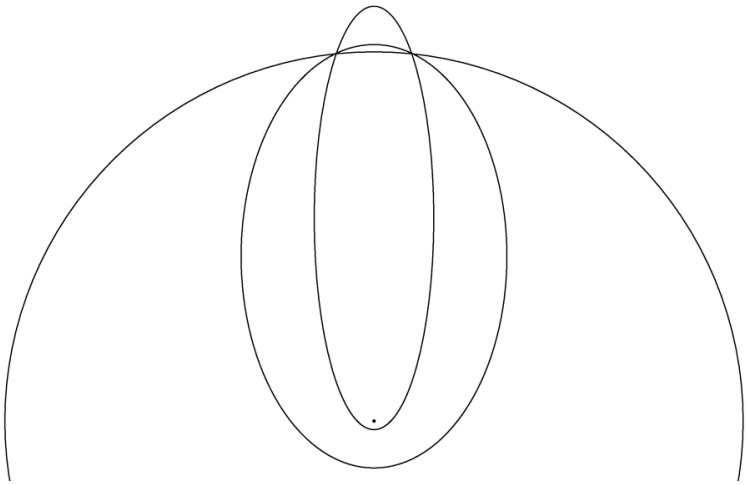

Figure 1. Two elliptical orbits through two points on the surface of the Earth. Both orbits have the same specific energy and thus a missile that can insert a warhead on one of these, can also insert a warhead on the other.

All the orbital options are ellipses, and each of them has a particular specific energy as all objects on a particular orbit have precisely that specific energy per unit mass, which depends only on the parameters that describe the orbit. In astrodynamics, specific energy ε is defined by

$$\varepsilon = \frac{v^2}{2} - \frac{\mu}{r}, \qquad (1)$$

where v is velocity, μ the gravitational parameter that for Earth orbits has the value $\mu_E = 3.986012 \times 10^5$ km^3/s^2, and r is the distance from the center of the Earth, that is, $r = R_E + h$, where R_E is the radius of the Earth and h the altitude above the Earth's surface. We assume that the Earth is spherical and has the radius $R_E = 6378\ km$.

ESTIMATING ACTUAL ORBIT PARAMETERS FROM TEST DATA

Given information from a test of the maximum altitude and the range obtained, it is possible to estimate the shape of the particular ellipse that represents the actual orbit of the missile or its warhead. For some useful definitions, see Figure 2.

Orbital ellipses can be described with the parameters eccentricity e and the conic parameter p, given the relation

$$r = \frac{p}{1+e\cos\nu}, \qquad (2)$$

where ν is an angle pointing out directions from the origin of a cylindrical coordinate system, and r is the radius distance in that direction. For a thin ellipse, e is close to 1, and for a circle it is 0. The parameter p is a measure of how thick the ellipse is, and for a circle it is the radius of the circle.

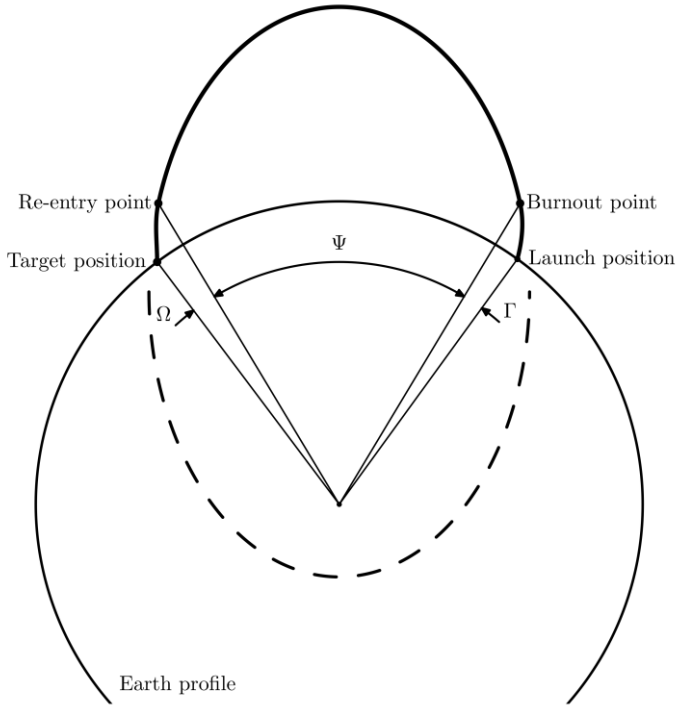

Figure 2: The orbit for a ballistic missile divided into three sections, boost phase covering the angle Γ, free-flight section covering the angle Ψ, and the reentry section covering the angle Ω. Each corresponding distance, R_p, R_{ff}, and R_{re}, is the related angle multiplied by R_E. The altitude is exaggerated in the figure relative to a realistic orbit covering such a distance.

Now we assume a realistic boost trajectory by setting values of the burnout altitude h_{bo} and an ascent angle φ_a that inserts the warhead into the elliptical orbit with the velocity at burnout relatively parallell to the elliptic orbit. This angle gives an indication of the free-fall range angle if we set

$$\Psi = \frac{R_t}{R_E} - 2\phi_a. \quad (3)$$

Now the parameters for determining the shape of the ellipse can be estimated by

$$e = \frac{h_{max} - h_{bo}}{R + h_{max} - \cos\frac{\Psi}{2}(R + h_{bo})} \quad (4)$$

and

$$p = \frac{(R + h_{max})(R + h_{bo})(1 - \cos\frac{\Psi}{2})}{R + h_{max} - \cos\frac{\Psi}{2}(R + h_{bo})}. \quad (5)$$

However, we are more interested in a, the semimajor axis of the ellipse that represents the orbit. It can be computed as

$$a = \frac{p}{1 - e^2}, \quad (6)$$

from which we get

$$a = \frac{R + h_{max}}{1 + e}. \quad (7)$$

Now, between specific energy and the semimajor axis a of any conic orbit the relation

$$\varepsilon = -\frac{\mu}{2a} \quad (8)$$

holds. With the value of a, this becomes

$$\varepsilon = -\frac{\mu(1 + e)}{2(R_E + h_{max})}, \quad (9)$$

where we use the computed eccentricity e (based on some assumptions) and the measured maximum altitude h_{max}.

To convert this specific orbital energy to a maximum range, we need the quantity

$$Q = \frac{v^2 r}{\mu}, \quad (10)$$

where Q is a measure of energy at a point on an orbit, and r is as before the distance from the Earth's center. However, for elliptical orbits there is also the relation

$$Q = 2 - \frac{r}{a}, \quad (11)$$

and at burnout the values are

$$Q_{bo} = 2 - \frac{R+h_{bo}}{a}. \qquad (12)$$

Maximal range is related to Q_{bo} by

$$\sin\frac{\Psi_{max}}{2} = \frac{Q_{bo}}{2-Q_{bo}}. \qquad (13)$$

Thus we have a method of assuming the ascent angle and the altitude for burnout, then using the measured maximum altitude and actual range of a test, after which we can compute the maximum free-fall range Ψ_{max}.

BALLISTIC MISSILE ACCURACY

Orbital ellipses are accurate and predictable, but actual warhead orbits are distorted by the forces on a warhead during its reentry, and this part of the orbit is not a section of an ellipse. Simply put, it is more difficult accurately to predict the impact point of a blunt reentry vehicle with large aerodynamic drag, as it will fall short of the elliptic orbit with miss distance being a nonlinear function of shape, atmospheric conditions, and initial position and velocity, including the angle velocity makes with the vertical when coming into the atmosphere. The time to traverse the atmosphere also depends on the aerodynamic drag, and uncertainties of the time introduce additional miss distance. Reentry vehicles with low drag tend to stay closer to the predictable elliptic orbit. Target accuracy is thus improved by low drag of a reentry vehicle. Low-drag vehicles are, however, more sensitive to heat loads and require better technology to protect the inner devices.

Accuracy is also affected by other factors, such as the sensors of the control system during ascent, the performance of the actuators used to control the direction of the thrusting force, and the implementation of the control system that computes the actual actuator control signals based on signals from navigation systems and other sensors. For the final stage, the bus, this includes how well the small adjustments to velocity are made depending on where the remaining parts of the missile are relative to the target, at what time, and with what velocity when the main engines have burned out.

ANALYSIS OF NORTH KOREA'S MISSILE TESTS DURING 2016–2017

During 2016–2017, North Korea performed several tests of ballistic missiles. Here we provide a review of some of these tests and the quantitative measures of performance that were publicly circulated at the time by news media, and in general attributed to government sources.

JUNE 22, 2016

In June 2016, North Korea made two tests of a Musudan/BM-25/Hwasong-10 missile. One failed but the other was successful, the only successful one of the first eight tests of this missile type. North Korea claimed[1] the maximum altitude (apogee) of this test was 1413 km. With the method described in section for Estimating Actual Orbit Parameters from Test Data, and assuming a near-vertical ascent angle of 86 degrees and a burnout altitude of 120 km, a maximum range of some 2573 km is obtained. This is below what would be expected for this missile type, but still impressive for someone starting to use technology not fully developed in-house.

With the maximum altitude of 1000 km, and identical assumptions as above, the maximum range is about 1760 km. It is clear that the maximum altitude of such very lofted orbits influences the maximum range significantly.

FEBRUARY 11, 2017

In February 2017, North Korea fired a Pukkuksong-2. According to military sources in South Korea[2], it flew about 500 km and reached an altitude of 550 km. Assuming a burnout altitude of 100 km and an ascent angle of 65 degrees, the maximum range is estimated at 940 km.

On May 21, 2017, they once again tested this missile with identical range and apogee.

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[1] https://www.38north.org/2016/06/jschilling062316/

[2] https://en.wikipedia.org/wiki/Pukkuksong-2

MARCH 6, 2017

North Korea launched four missiles into the Sea of Japan[3]. They flew some 1,000 km before splashing down in the sea. Information on the maximum altitude 260 km was obtained from somewhere, but it is unclear where it came from. Assuming a burnout altitude of 80 km and an ascent angle of 45 degrees, the maximum range of this missile is about 910 km. This is close, but still a bit too short. The range and altitude figures are a bit uncertain, though.

MAY 13, 2017

In May 2017, North Korea tested a Hwasong-12 missile. This missile reached an altitude[4] of 2111 km and flew 787 km. Assuming a burnout altitude of 100 km and a near-vertical ascent angle of 86 degrees, the maximum range is estimated at 4,080 km.

JULY 5, 2017 AND JULY 28, 2017

On July 4, 2017, North Korea made a first test of a Hwasong-14[5]. arguably an intercontinental ballistic missile (ICBM). This missile reached an altitude of 2,802 km and flew 933 km. Assuming a burnout altitude of 120 km and a near-vertical ascent angle of 86 degrees, the maximum range is estimated at 5,489 km. This is just below the limit for what is called an ICBM.

On July 28, they made a second test of this missile, and this time it reached 3,725 km and flew 998 km. Assuming a burnout altitude of 120 km and a near vertical ascent angle of 87 degrees, the maximum range is estimated at 7,566 km. This was clearly an ICBM. But it is not known whether this was obtained by lowering the payload mass, compared to the previous test.

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[3] https://www.nytimes.com/2017/03/05/world/north-korea-ballistic-missiles.html

[4] https://en.wikipedihttps://en.wikipedia.org/wiki/Hwasong-12

[5] https://en.wikipedia.org/wiki/Hwasong-14

SEPTEMBER 15, 2017

North Korea launched a missile that overflew Hokkaido in north Japan, with a maximum altitude of 770 km, reaching a distance of 3,700 km. Assuming a burnout altitude of 120 km and an ascent angle of 60 degrees, the maximum range is estimated at 3,600 km. This is very close to what was actually reported[6].

A plot of the computed based on measurements is shown in Figure 3.

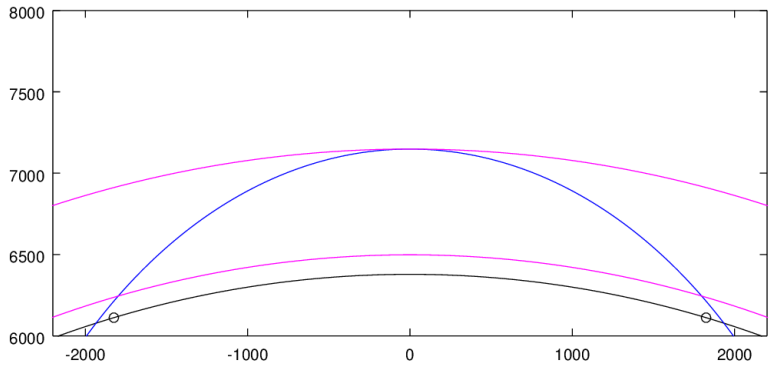

Figure 3: The orbit profile for the September 15, 2017, missile test that overflew Japan. Numbers are coordinates with unit kilometer. The lower circular arc is the Earth's profile, and the lower purple arc is the upper atmosphere at about 100 km altitude. The upper purple arc indicates the maximum altitude reached by the missile or warhead.

NOVEMBER 28, 2017

North Korea launched a missile that reached a maximum altitude of 4,500 km, which flew 960 km. Assuming a burnout altitude of 120 km and an ascent angle of 86 degrees, the maximum range is estimated at 9,490 km. This estimate is likely below the actual performance. It is not known what the payload mass was.

CONCLUSIONS

The method of estimating specific energy as a means for obtaining maximum range works well for normal long-range orbits, which are close to minimum-energy orbits.

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[6] http://www.bbc.com/news/world-asia-41275614

However, more work is needed to assess the impacts of gravity drag. This is important for near vertical launches, which the Democratic People's Republic of Korea used several times during the past two years, likely to avoid overflights of foreign territory.

CHAPTER 3

Technical Assessment and Prospects on North Korean Nuclear Capability

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INTRODUCTION

On April 27, 2018, a historical inter-Korean summit meeting was held at Panmunjom, a symbol of the two countries' division, and it was possible to establish an opportunity for negotiations on the denuclearization of North Korea. The Trump administration strongly promoted a policy of "maximum pressure and engagement" in North Korea. However, the tension between North Korea and the United States has been somewhat relieved through the efforts of the South Korean government. The Korean government's role in understanding both the US and the North Korean position was crucial to the change in the situation on the Korean peninsula. The summit meeting between the United States and North Korea, held on June 12, 2018, must be the beginning of a new history. However, the role of the Korean government as mediator will become more important in the future, as it is difficult for long distrust and conflicts to be cleared up through a single encounter. This paper aims at predicting how North Korea's ballistic missiles will be developed regardless of North Korea's success at denuclearization in the future.

At present, the concept of war in North Korea is expected to be an asymmetrical conventional war under the nuclear threat. This concept of war is estimated by reflecting North Korea's current military strength. In the near future, if North Korea develops tactical nuclear weapons, it is expected that such a concept of war will be developed into a "North Korean nuclear war" that aims at winning by offsetting the conventional power of South Korea. In other words, the second Korean war scenario that North Korea uses is "a decoupling strategy" aimed at neutralizing US extended deterrence with strategic nuclear weapons such as intercontinental ballistic missiles (ICBMs) and submarine-launched ballistic missiles (SLBMs), and the "North Korean

A2AD [anti-access area denial] strategy" to block the access of US troops with tactical nuclear weapons such as the Polaris (북극성)-2 or Scud-ER antiship ballistic missiles (ASBMs).

On the one hand, considering the geographic conditions and the military strategy of Japan and Guam, the role of Rodong and Musudan missiles capable of attacking US bases in Japan and Guam in the Pacific, it can be said that alliance separation and A2AD strategies are both partially achievable. The Rodong missile with a nuclear warhead can be said to be aimed at offering extended deterrence against the United States, and Japan's willingness to participate as a backbone, by threatening Japanese forces and US forces stationed in Japan. However, because the Rodong missile does not affect US territory or the majority of Americans, there are limits to the means of separating the alliance. On the other hand, the Musudan missile is expected to benefit from the partial alliance segregation strategy by attacking the nearest US territory instead of the US mainland. In the absence of a direct means to strike the US mainland, use of this missile is expected to exert an access denial effect. After US intervention is blocked, North Korea would try to secure an asymmetrical advantage over the Republic of Korea (ROK) military's conventional power by mounting a large amount of a nuclear warhead on its own Scud-B/C.

The asymmetrical power that Pyongyang is pursuing can be classified into nuclear weapons and the rest[1]. The role of nuclear weapons that North Korea's dependence on nuclear weapons is expected to be greater than the expectations for other nuclear powers on their nuclear weapons. In general, nuclear powers have pursued nuclear development aimed at deterring enemy nuclear threats, while North Korea, in addition to its goal of securing nuclear retaliation capability, would have to overcome its weakness in conventional power against the ROK-US alliance. Therefore, North Korea's nuclear development is not expected to end at its securing minimum deterrence against the United States. The deterrence of conventional power, which

[1] In order to overcome the relative weakness of the Korean military's conventional military power since the Korean War, North Korea has developed a dependency on asymmetrical military means. North Korea's asymmetrical military power, such as nuclear weapons, biochemical weapons, multiple launch rocket systems, special forces, unmanned aerial vehicles, and cyber capability, has been pursued to overcome the limitations of symmetrical conventional military development. As the gap between North Korea and South Korea in conventional symmetrical military forces, such as tanks, airplanes, and ships, will increase as time goes by, North Korea will continue to develop various asymmetrical forces and secure a means of war through choice and concentration on their nuclear weapons.

is boosted not only by the United States but also by Hawaii, Guam, and the United States Forces Korea, would have been an important axis of North Korea's nuclear development. In other words, it is impossible to rule out the possibility of starting a tactical nuclear weapon at the same time as a strategic nuclear weapon. Clues to the development direction of North Korea's tactical nuclear weapons may be found in the new concept of the "Juche (주체) weapon".

STRATEGY FOR THE DEVELOPMENT OF NUCLEAR WEAPONS AS A JUCHE WEAPON

The concept of the Juche weapon pursued by North Korea is well expressed in the business summation (사업총화) of the Seventh Congress[2]. It emphasizes the need to develop precision, lightweight, unmanned, and intelligent Juche weapons. I cannot help but wonder what the meaning of precise, lightweight, unmanned, and intelligent is, compared to the existing miniaturization, weight reduction, and diversification[3].

It is assumed that nuclear weapons are miniaturized, lightweighted, diversified, and standardized with nuclear warheads. However, it is assumed that the precision, lightweight, unmanned, and intelligentization of Juche weapons are limited to the ballistic missile as a means of delivering nuclear weapons.

PRECISION

First, precision can be interpreted in terms of accuracy. In the case of nuclear weapons, whose accuracy has improved to precision strike, it refers to nuclear weapons used for tactical purposes. Of course, strategic nuclear weapons also require accuracy. This is a case in which strategic nuclear weapons should be capable of attacking an ICBM launch base, which is the enemy's military target, as North Korea would not target a US ICBM launcher, which would more closely match tactical nuclear weapons grade than strategic nuclear weapons. Therefore, it can be said that North Korea's precision as a Juche weapon implies the development of

[2] *Rodong Newspaper*, May 8, 2016, p.9.
[3] North Korea says that "lightweight" means miniaturization of nuclear warhead, which refers to a nuclear warhead with low yield. Therefore, it can be interpreted as the intention to give it a small footprint that is smaller and lighter. In addition, because of the trade-off characteristics of missiles, if the weight of the payload is smaller, it can be sent farther with the same ballistic missile of the same specification, so weight reduction also means enlargement of the range.

tactical nuclear weapons. From a Pyongyang perspective, tactical nuclear weapons correspond to Scuds, Rodong, and Polaris (북극성)-1 and -2, which are equipped with nuclear warheads[4]. For reference, nuclear shells, nuclear backpacks, and nuclear torpedoes, which were developed during the Cold War era, are not likely to be subject to precision. North Korea is unlikely to develop nuclear shells, which are somewhat unfavorable to precision because their power is far too high compared to the range. For nuclear shells, the accuracy of nuclear weapons may not be significant. Nuclear backpacks are not dropped, so their use has nothing to do with precision, and for the nuclear torpedo, the effect of precision is irrelevant because it has a short range compared to the yield, just like a nuclear shell. The purpose of still testing the already developed Scud-ER and Rodong missiles is to improve precision.

Likewise, it seems that the purpose of avoiding interception is hidden in the two-stage rocket system of the newly developed solid-fuel ballistic missile, the Polaris-1 and -2. The first-stage rocket requires the necessary range and speed, while the second-stage rocket requires the avoiding of interception. In the end, it is expected that the Scud-ER, Rodong, and Polaris-1 and -2 will be used as "North Korean A2AD" by improving their precision as tactical nuclear weapons[5].

[4] The criterion for distinguishing strategic weapons from tactical weapons is relative, and for the same weapon system, attacker and defender may be accepted as strategic weapons and tactical weapons, respectively. For example, if a North Korean Scud missile is equipped with a 20 kt nuclear warhead, North Korea could accept it as a tactical nuclear weapon, while South Korea could recognize it as a strategic nuclear weapon. It depends on how the damage from a nuclear attack affects the fate of a nation. In the case of North Korea, which has to deal with the ROK-US alliance, Scud missile is accepted as a tactical nuclear weapon because it is not enough to get the victory of the war. Sud missile is accepted as a strategic nuclear weapon because it can threaten our own survival by attacking with a nuclear warhead.

[5] It is advantageous that the Polaris-1 has a single stage rather than two stages because of the height limitation of the Sinpo class submarine. However, new Polaris-1s having two stages were test-fired in March and August 2016, respectively. A similar case can be found in the SLBM R-27 and the improved R-27K of the former Soviet Union. The Polaris-1 has been developed by copying the R-27. The R-27 was a reliable single-stage liquid rocket type SLBM mounted on a Golf-class submarine. The R-27K was an improved ASBM with a two-stage liquid rocket. As the engine was added in the middle, without increasing the length, the amount of propellant was reduced so that the range decreased to less than half. Nevertheless, the reason for adopting the R-27K in two stages was to increase precision. North Korea announced that it was equipped with a precise guided missile intercept evasion technique after its launch on February 12, 2017, in the form of a two-stage rocket system of Polaris-2.

LIGHTWEIGHT

The expression lightweight is of course different for nuclear warheads and missiles. Lightweight for nuclear warheads means they are small and lightly produced nuclear warheads, while lightweighting missiles does not simply reduce the weight or size of the liquid fuel engine by converting it to a solid fuel engine. In other words, it is possible to reduce the requirement for additional equipment (fuel, oxidizer supplementation device, facilities) and to start the operation in the nighttime by using a solid fuel engine and an infinite track vehicle in the Polaris-2 type. In this way, it is possible to simplify the operation from preparation to launching and to shorten the time, and it is possible to reduce the need to maintain the transporter erector launcher moving path.

Scud-ER and Rodong missiles, which still use liquid fuel engines, are expected to be replaced by solid-fuel engine missiles in the long run to lighten their actions, but for now, the launch system should be simplified to reduce launching preparation time, and North Korea will strengthen its efforts to shorten time to reload for launching continuously. For example, replacing a navigation device with an electronic gyro instead of a mechanical gyro can dramatically reduce the preparation time and lighten the action. So, it is dangerous to judge that there is no need to lightweight a weapon system because it has already been developed, because the response systems of the ROK-US alliance will be different depending on whether or not it accepts that North Korea's time to prepare for launching a missile may become shorter, and the effect of the kill chain will be differentiated when it is actually operated.

UNMANNED

Unmanned weapons may seem unlikely to apply to nuclear weapons, but unexpectedly may be very important. This is because they can play an important role in providing the accurate location of targets in the sky above a target area and determining whether to attack again through damage assessment. For the above-mentioned "North Korean A2AD", it is essential to provide real-time monitoring of the position of a US aircraft carrier and to supply relevant location information to the North Korean Strategic Rocket Command. It is almost impossible for North Korea, which has absolutely low air power, to operate a reconnaissance aircraft on

the high seas, but when it comes to UAV, if it is not right now, it is more likely to use advanced commercial technology. Unmanned reconnaissance aircraft with stealth capability are expected to be able to transmit the movement of and accurate location information for the US Seventh Fleet to Pyongyang while being active in the Western Pacific region, the Korean peninsula, and Japanese waters. Naturally, not the US commercial GPS, but BeiDou (北斗) and GLONASS satellite signals from China and Russia will be useful to obtain information about the target. An ASBM is a means of attacking an aircraft carrier based on the information provided by a UAV. In the sense that the Scud-ER, which has been tested and fired several times recently, is a means of nuclear shooting developed by Russia in order to attack targets moving within a range of 1,000 km, there is no reason for North Korea to simply limit fixed targets on the ground. The Scud-ER, Rodong, and Polaris-1 and -2 are considered improved or newly developed, to be used as ASBMs.

INTELLIGENCE

"Intelligence" means developing smarter (nuclear) weapons. It may mean maximizing attack power by intelligent means of shooting rather than the use of nuclear warheads. That is, nuclear warheads have the ability to penetrate missile defenses and strike targets. North Korea mentioned about intercept escape capability in the statement after the Polaris-2 test launch. A general (nonintelligent) weapon system is supposed to perform a mission through human command. However, an intelligent weapon system should at least be able to judge and act on its own without command. If applied to a missile, the situation in which such intelligence is required is likely to be one that avoids interception because not much can be commanded in the ground control center in order for a missile to avoid interception. It is difficult to say that a missile is intelligent enough to avoid interception by simply moving along a specified path. Thus, intelligent intercept avoidance is the detection and counteracting of intercept attempts. The only way to detect intercept attempts is to recognize the signals of the detection radar by the nuclear warhead reentrant. Normally, an interceptor missile is fired at an approximate intercept position based on the trajectory of a nuclear warhead captured by ground or sea detection radar, and then it captures and tracks the infrared signal of the nuclear warhead. Therefore, the only way to determine that a nuclear warhead is caught in a missile defense system is to analyze the signals of the detection radar. And the way to avoid an interceptor missile is to modify the

trajectory, fire a decoy, or disturb or destroy the interceptor missile. Decoys, separated from nuclear warheads automatically after boosting, seem unrelated to intelligent nuclear weapons. In other words, intelligent nuclear warheads should be redirected to avoid an intercept, or to actively attack an interceptor missile if it is judged to have been captured by detection radar. Furthermore, it would be better if warheads had the ability to attack and neutralize the detection radar by themselves.

Although North Korea seems to be rushing to develop strategic nuclear weapons so that the US nuclear umbrella does not reach the Korean peninsula at present, its development of tactical nuclear weapons will be underway because it is well known that strategic nuclear weapons alone cannot guarantee victory in the Korean peninsula. Although it may be understood that it is common for nuclear-weapon states to switch to producing tactical nuclear weapons once they have completed strategic nuclear weapons, the possibility cannot be excluded that North Korea may be planning to complete development of the two at the same time. In this sense, we can see that there are many coinciding parts when we apply the precision, lightweight, unmanned, and intelligence pursued in the production of the Juche weapons to tactical nuclear weapons.

CONCLUSION

Taken together, North Korea is developing the ASBM as a tactical nuclear weapon, and the Scud-ER, Rodong, and Polaris-1 and -2 can become candidates for ASBMs. North Korea will use a satellite navigation system for precision, shorten the launch time by reducing the weight of the action, and make precise guidance to attack an aircraft carrier by using unmanned reconnaissance vehicles. Intelligent nuclear warheads are expected to have a smart warhead reentry system that actively avoids intercepts and destroys interceptor missiles as well as ground and sea radar.

Negotiations on the denuclearization of North Korea are taking place more slowly than expected. Political events are waiting for North Korea and the United States in the second half of 2018, and it is difficult to predict how negotiations will develop in the future. In addition, because the trade conflict between the United States and China is showing signs of intensifying, the denuclearization of North Korea may be further delayed due to China. In the worst case, North Korea may return to the path of nuclear development again. In this regard, North Korea's ballistic missile

development needs to be monitored constantly regardless of denuclearization negotiations.

CHAPTER 4

Evaluating the US Approach to North Korean Threat under Trump Administration

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Japan Institute of International Affairs

Introduction

Last year, in the early morning hours of August 29, 2017, many Japanese citizens in the northern prefectures were awaken by a jarring J-Alert[2] notice of an imminent missile from North Korea headed in Japan's direction. The missile test of Pyongyang's new intermediate range ballistic missile (IRBM) — the so-called Hwasong 12 — had a trajectory that flew over Japan's northern island of Hokkaido. The missile test was another shock to Japan's sense of vulnerability to the region's growing threats. Indeed, the August 29 test appeared to break the threshold of ballistic missile overflights of Japan's airspace — an informal practice that the North had avoided up until that point. Pyongyang then followed up its initial test over Japan with a subsequent Hwasong 12 test in September that also had a trajectory over northern Japan but travelled a distance much farther[3] than the earlier launch.

The intensity of North Korea's missile program – both in terms of frequency of tests and speed of enhanced capabilities – is making for very difficult strategic choices for United States and its allies which are looking to deter and defend against Pyongyang's bellicosity. Further raising anxieties in the region is the North's concurrent developments on its nuclear program — as evidenced by its test of

[1] The author is a senior visiting fellow at the Japan Institute of International Affairs, a distinguished fellow at the Asia-Pacific Foundation of Canada, and is a senior fellow at the Asian Forum Japan. The views expressed are his own. This paper was based on discussions, held at the National Defense Academy, in February 2018.

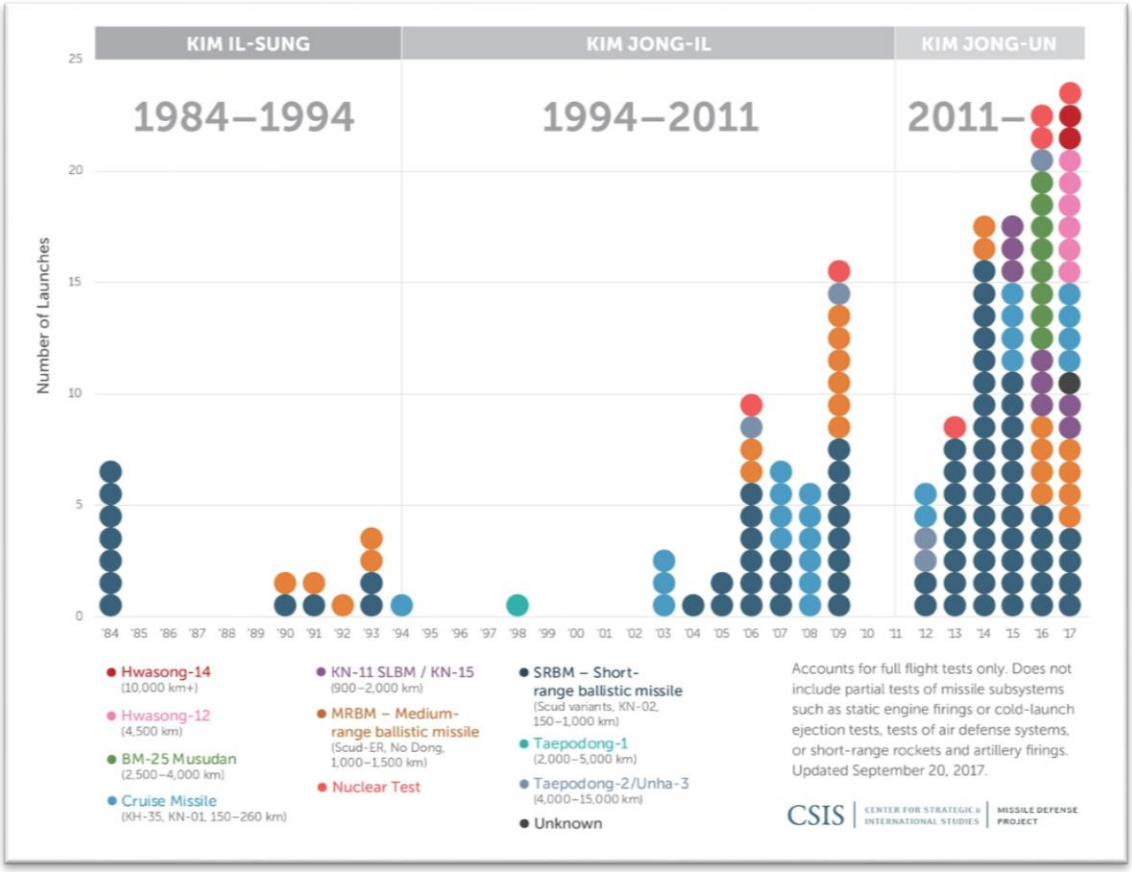
[2] Ministry of Defense of Japan, "Efforts to Protect Civilians in an Armed Attack Situatio n and Other Situations", Ministry of Defense, 2006. http://www.mod.go.jp/e/publ/w_pa per/pdf/2006/3-4-1.pdf

[3] http://www.usfj.mil/Media/Press-Releases/Article-View/Article/1311946/us-pacific-com mands-statement-on-latest-north-korea-missile-launch/

hydrogen bomb in September and its rapid improvements on the process of miniaturization of a nuclear war[4] head to fit on top of one of its ballistic missiles.

Fig. 1 North Korean missile launches

Pyongyang has also raised concerns in the region due its developments towards perfecting its capabilities on an intercontinental ballistic missile (ICBM) — and has



already successfully tested such a delivery system through its "lofting" trajectory tests[5] this past July. These developments have further convinced the US to double-down on deterrence efforts with its two East Asian allies — Japan and South Korea, and also look to bolster trilateral security cooperation despite lingering bilateral strains between Tokyo and Seoul.

[4] https://www.washingtonpost.com/world/national-security/north-korea-now-making-missile-ready-nuclear-weapons-us-analysts-say/2017/08/08/e14b882a-7b6b-11e7-9d08-b79f191668ed_story.html?utm_term=.14dcd0e4b31d
[5] http://www.mod.go.jp/e/press/release/2017/07/29b.html

STRATEGIC CONTEXT

In June 2018, US President Donald Trump met with North Korean leader Kim Jong-un in Singapore and made pledges to work towards the "denuclearization of the Korean peninsula". The summit, which followed inter-Koreas meetings and multiple trips to China by Kim, was on high on theatrics with a backdrop at a luxury resort and marked the first time a sitting US President has sit-down with a leader from North Korea — a country that it is still technically at war with (although conflict has been largely latent the armistice signed in 1953). While the Singapore meeting was a welcome move towards diplomacy between Washington and Pyongyang, many analysts remains skeptical due to the fact that there was no mention whatsoever of verification in the joint release after the summit — despite US Secretary of State Mike Pompeo's subsequent insistence that verification was "mutually understood" to by both sides in the communique's version of "complete denuclearization of the Korean peninsula".

Indeed, over the past few years, the regime of Kim Jong-un in North Korea continues to expand the size and scope of its nuclear weapons program and its ballistic missile capabilities. The North has also worked on the miniaturization of a nuclear warhead — which could be tipped on its ballistic missiles in order to be a more credible nuclear deterrent. But, despite all of these provocations - and an umbrella of sanctions and efforts to deter Pyongyang — there is no indication that the North is willing to negotiate in good faith to rollback its nuclear weapons capabilities — as demanded by the US, Japan, South Korea and others in the international community. This had raised the specter, in some circles in Seoul and Washington, that it might be time to put more serious thought into a pre-emptive strike or other military action against the North. While the end result would almost surely be the end of the Kim regime in the North, the costs of such potential action remain unacceptably high, leaving the prospect of pre-emptive military action on the Korean peninsula a last case and undesirable policy option.

Fig. 2 North Korea's missile arsenal

The past two years have been marked by incremental and sustained provocations by the Kim regime in North Korea. In addition to three nuclear tests, Pyongyang has also conducted numerous tests of its ballistic missile program — all in defiance of sanctions put in place by the United Nations Security Council (UNSC)[6]. Meanwhile, Kim — despite summits now with South Korean President Moon Jae-in and US President Donald Trump - has shown no indication that the North is interested in bartering its cherished nuclear weapons capabilities in a renovated version of the long moribund Six Party Talks — or some other form of multilateral discussions. Indeed, most rhetoric from Pyongyang now indicates an interest in talks under the precondition of denuclearization — at least in complete and verified terms - is a non-starter.

Last year, North Korea opened its Worker's Party Congress (WPC)[7] in Pyongyang amidst much pomp and ceremony. Before the meeting, a WPC had not occurred in the North for almost forty years, since the 1980 session, which served as a grooming event for his late father, Kim Jong-Il. During the event, Kim reinforced — on the

[6] http://www.securitycouncilreport.org/un-documents/dprk-north-korea/
[7] http://38north.org/2016/05/rfrank052016/

biggest stage — the North's commitment to maintain its status as a "nuclear weapons state" — a notion that the regime believes adds to its legitimacy and provides deterrence against the US and South Korea. Kim has also enshrined the importance of the nuclear weapons program through the adoption of *byungjin* line — which dovetails the North's development of nuclear weapons alongside its stated priority of economic growth and development.

The inability of the international community to shape or alter North Korea's calculus through diplomacy, along with the simultaneous expansion of its WMD capabilities, has raised questions amongst some in Seoul and Washington on whether the only solution remaining is the use of force. But, while most policymakers and experts familiar with the North Korea situation stress the importance of the credible threat of the use of force — for deterrence purposes — few actually see it is a viable option. There are numerous reasons for this but the most central reason is the difference in risk tolerance between Pyongyang versus that of Seoul and Washington (and potentially Tokyo as well).

STRATEGIC PATIENCE: LESSONS FROM THE PAST

The approach of the former Obama administration to Pyongyang's provocations and escalations was essentially styled as a type of containment policy sprinkled with occasional carrots. The policy — dubbed "strategic patience"[8] — relied on the imposition of sanctions and the enhancement of deterrence in order to dissuade the North's pursuit of nuclear weapons. Indeed, Obama remained consistent in his policy of unwillingness to accept Pyongyang's nuclear weapons status.

Shortly following the North's nuclear test in September, 2016, Obama remarked[9] that: "To be clear, the United States does not, and never will, accept North Korea as a nuclear state". Far from achieving its stated national security and economic development goals, North Korea's provocative and destabilizing actions have instead served to isolate and impoverish its people through its relentless pursuit of nuclear weapons and ballistic missile capabilities. Finally, Obama took ownership of the stakes involved[10] with the North's volatile behaviour: "As

[8] http://www.cfr.org/north-korea/us-policy-toward-north-korea/p29962

[9] https://www.whitehouse.gov/the-press-office/2016/09/09/statement-president-north-koreas-nuclear-test

[10] https://obamawhitehouse.archives.gov/the-press-office/2016/09/09/statement-preside

Commander in Chief, I have a responsibility to safeguard the American people and ensure that the United States is leading the international community in responding to this threat and North Korea's other provocations with commensurate resolve and condemnation".

The approach from the Obama administration however failed to dissuade the North from advancing both its nuclear and missile programs. Especially over the last two years of his administration, Obama was been spinning diplomatic tires with a seemingly defiant and resigned acceptance that problems on the Korean peninsula would not experience any significant amelioration during the last months of his tenure. Indeed, he warned President Donald Trump — his successor — that tensions on the Korean peninsula would be his biggest and most immediate security challenge after Trump's election last November.

The one area of measurable improvement under the Obama administration regarding the Korean peninsula was its efforts to enhance deterrence through its alliances with South Korea and Japan. Obama exerted intense efforts to bring Seoul and Tokyo together and concentrate on the threat from North Korea[11]. This proved an exhausting and difficult initiative at times over the past three years as ties between Japan and South Korea plummeted over historical issues. But resilience paid off for Obama — at least temporarily — as ties are slowly improved between Tokyo and Seoul in 2014-15 and was a noticeable uptick in trilateral security cooperation with joint exercises, frequent high-level diplomatic meetings and a new trilateral information sharing agreement that demonstrate joint resolve to deter future North Korea provocations.

Deterrence efforts within the US-ROK alliance framework are also growing. Despite intense criticism from China, South Korea and the US have agreed to deploy the Terminal High Altitude Air Defense (THAAD) system[12]. Proponents of deploying the THAAD system to the Korean peninsula argue that the current anti-missile capacity from the South Korean and US Forces is insufficient to meet the evolving challenges posed by the North's arsenal of short and medium-ranged missiles. Before the THAAD deployment, the US Forces in Korea are limited to Patriot Advanced Capability (PAC) batteries which only target missiles during their final descent and lack THAAD's ability to intercept missiles at a higher altitude.

nt-north-koreas-nuclear-test

[11] http://dod.defense.gov/News/Article/Article/604481/us-japan-south-korea-hold-trilateral-security-talks

[12] https://www.army.mil/article/171316/us_to_deploy_thaad_missile_battery_to_south_korea

Critics of THAAD's potential impact note that, despite its enhanced capabilities, it would likely be unable to fend off a massive attack from the North, which has the ability to deploy 1,000 short-medium range missiles.

MAXIMUM PRESSURE AND ENGAGEMENT

In response to the latest provocations, the Trump administration declared an "end to Strategic Patience" and rolled out is new policy of "Maximum Pressure and Engagement [13] ". Essentially the new policy looked at doubling-down on the commitment to denuclearization but with stronger coercive diplomacy laced with the threat and ambiguity of military action. Trump stoked tensions and concern in the region through his promise of "fire and fury" if North Korea provoked the US and its allies. He further promised to "totally destroy" Pyongyang if it attacked first.

But Trump's goal towards turning the screws on the regime of Kim Jong Un in North Korea depends on more than just deterrence and solidarity with Japan and South Korea. One of the cornerstones of US policy has been to pressure China — North Korea's biggest source of trade and commerce — to get tough on Pyongyang. Washington has also looked to stitch together meaningful — and sustainable — international commitment to working towards denuclearization on the Korean Peninsula.

This starts of course with Japan and South Korea — as the region's top US allies and key stakeholders in the brewing crisis. But it will also require a consistent and nuanced approach to China, which remains North Korea's largest trading partner. Despite Beijing's own frustration with the Kim regime, and its incremental efforts to impose new sanctions on the North — their efforts to reign in Pyongyang need to continue and it is crucial that efforts are made to verify the implementation of sanctions. There has been much effort — some successful - on new sanctions and working more stridently with China on the implementation of the existing sanctions regime — but neither of these are new options in the toolkit.

Moreover, neither lever has proven demonstrably effective as the North continues

[13] https://nl.usembassy.gov/secretary-tillerson-addresses-state-department-employees-washington/

to push through on its weapons development despite sanctions. Meanwhile Beijing, despite taking an incrementally tougher stance vis a vis Pyongyang, continues to be unwilling to make a comprehensive shift in its approach towards North Korea.

The election of Moon Jae-in in South Korea in 2017 has been another an important marker on the Korean peninsula crisis. At first, there was a great deal of caution on how Moon and Trump will interact and how the intersection of Washington's "Maximum Pressure and Engagement" would dovetail with Moon's desire to retro-fit Seoul's hardened approach to the North. In some sense, there has been common ground between the two — both have signaled engagement is a possibility, including even meeting with leadership in Pyongyang. On this note, Trump appeared to tout himself as kingmaker — resulting in the pre-Olympic diplomacy between South and North Korea. That said, there are also glaring divergences coming to the US-Korea relationship too. Moon seems disenchanted with the "deterrence plus" approach at turning the screws on North Korea and will likely push back on the need for talks on more robust trilateral security cooperation with Japan. Moon is also likely to brush off suggestions of regional missile defense — and has previously bristled at THAAD and the Japan-South Korea GSOMIA intelligence-sharing pact. This makes for a mix of uncertainty in the US-Korea relationship going forward.

MILITARY OPTIONS?

The situation in the Korean peninsula continues to be a critical insecurity challenge for Washington also, but its military options to respond to the North's provocations and threats remain limited. That said, as the North continues to refine its ballistic missile capabilities — in both range and accuracy terms — the threat to continental US becomes clearer. This has prompted some in the US to start warning that the next administration might face a critical question on the need for the use of force against Pyongyang. As retired Lt. Gen. Mark Hertling remarked recently[14], "When you have this many tests, you are eventually going to get it right. That's what concerns me. As soon as they have one test that they could classify as an extreme success, then we are talking a whole different ballgame (in) their potential to threaten other sovereign nations in their area but also potentially parts of the United States".

[14] http://edition.cnn.com/2016/08/17/politics/north-korea-nuclear-attack-warning-time/

These concerns about North Korean capabilities have led to the so-called "bloody nose" argument of a pre-emptive slap at North Korea to demonstrate US resolve and punish it for its defiance. In this argument, it is thought that deterrence — and Washington's overwhelming ability to respond in concert with its allies — would restrict or mitigate any North Korean retaliation. The "bloody nose" approach is premised, therefore, on a measured or negligent kinetic response from Pyongyang.

The reality remains however that there is very little evidence to suggest that North Korean regime would — or perhaps even could — roll over a take a bloody nose strike. Moreover, despite the valid concerns on Pyongyang's capabilities, the potential costs involved with military action remain unacceptably high. In addition to the issue of Pyongyang's missile capabilities and concerns about it WMD programs, the most critical threat remains the North's ability to inflict significant damage on South Korea through its conventional forces, in addition to its ability to create asymmetric problems through cyberwarfare and terrorism.

The US-ROK alliance force has a wide gap in qualitative capabilities over the North, but this leverage does not eliminate the ability of the North to lash out with its vast artillery batteries, which are trained on Seoul. This not only threatens millions of Korean civilians but also the lives of thousands of US troops stationed there. Most scenario planning and contingencies indicate that the US-ROK alliance would have little problem winning a conflict on the Korean peninsula, as a result of their significant advantage in qualitative capabilities.

But the challenge for Washington and Seoul has always been measuring proportionality of their potential military actions and assessing the likely reaction from Pyongyang. In other words, the overwhelming military advantage enjoyed by the US and South Korea provides important deterrent benefits but its applicability is limited in scope unless the security situation descends so rapidly that the use of force is seen as the only avenue. Such a calculation also must take into account the benefits versus the potential costs — as Washington and Seoul have a desire to manage the escalation ladder. This is true for all types of hypothetical military actions — whether it be strikes aimed at degrading Pyongyang's nuclear capabilities or more invasive plans aimed at the North's critical military infrastructure sites and command and control centers.

This has resulted in a balanced and strategically ambiguous posture from the US on the possibility of the military option. Trump — along with his predecessors — continues to stress that military force cannot be taken off the table and reinforced Washington's indivisible commitment to Seoul. This is a sensible policy for the US, considering its deterrence efforts are grounded on the credibility attached to its commitments to South Korea.

There has also been some talk, especially in South Korea at the end of the Park administration, on the capabilities that could be used to take out the leadership in Pyongyang. South Korea's former Defense Minister, Han Min Koo, revealed such plans after the North' most recent nuclear test in September. Han stressed that, if the situation required, Seoul has prepared a so-called "assassination unit" that would focus its efforts on removing the key leadership figures in North Korea, including Kim Jong-un. Han specifically noted that, "if it becomes clear the enemy is moving to attack the South with nuclear missiles, in order to suppress its aims, the concept (of the special forces) is to destroy key figures and areas that include the North Korean leadership". Former South Korean President Park Geun-hye also stressed the need for steely resolve against the North and has promised significant retaliation against any potential attacks from Pyongyang — such as previous strikes against the naval corvette, the Cheonan, or the shelling of Yeonpyeong island — both in 2010.

LOOKING FORWARD

Instability on the Korean peninsula will undoubtedly remain a concern throughout the Trump administration and there are no silver bullets. Trump — and his predecessors — have tried almost every option in their playbook with the aim of convincing the North to give up its nuclear capabilities and restrain the growth of its missile program. The most recent approach involved an unprecedented diplomatic outreach to Kim Jong-un, with hopes that the North's top-down system will push forward a path towards denuclearization. Despite this, the US needs to remain steely-eyed and focused on the evolving threat from Pyongyang. In response, Washington should accelerate deterrence efforts and double down on its trilateral coordination with its Northeast Asian allies — Tokyo and Seoul.

The US should also coordinate with Seoul and Tokyo (in addition to China and Russia) on pushing for sanctions with a larger bite — including levying penalties on banks that deal with North Korea. The sanctions may not pass through the United Nations Security Council, due to China's resistance, but the three sides can still work towards a multilateral sanctions regime that would further tighten the screws on the North. This is a necessary option especially if talks fizzle between the US and North Korea over the coming months. Meanwhile, the US should also look at balancing this tightening of the vice with a sustained diplomatic effort for Pyongyang to demonstrate its intentions on denuclearization. Up until this point, the carrot-and-stick approach has been lacking and Washington, along with its allies, has basically withdrawn incentives for North Korea to negotiate because of an — understandable — trust deficit. Despite this lack of trust, pressure and coercion alone will not lead to denuclearization in the North.

CHAPTER 5

North Korea's Evolving Strategy toward the United States: Kim Jong Un's New Buy-Time Tactic

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INTRODUCTION: NORTH KOREA'S TACTICAL SHIFT

After launching 55 ballistic missiles and conducting four nuclear tests since April 2012, North Korea declared that it had finally achieved "the state nuclear force" on November 29, 2017, when the country successfully test-fired an intercontinental ballistic missile (ICBM) Hwasong-15[1]. With all these achievements, the Kim Jong Un regime then made a new tactical move in a rather abrupt manner at the beginning of 2018. This new move is two phased: 1) taking advantage of South Korea's engagement policy and 2) agreeing to the US offer for a summit meeting between US president Donald Trump and Kim Jong Un. Kim met with President Moon Je-in of South Korea on April 27 and then with President Trump on June 12, 2018, maintaining a "peaceful" atmosphere while avoiding substantial denuclearization. This leaves us wonder whether North Korea's ostensible shift to a softer diplomatic attitude might be just one of its usual buy-time tactics employed for multiple purposes, and whether the priority is likely to secure and enhance the state nuclear force and deterrence power against the United States while maintaining the framework of the *Byungjin* strategic line. By definition, the strategic line allows Pyongyang to shift its focus to economic development. No official statement by the regime has been found so far to indicate that the regime has abandoned its nuclear and missile program.

In this paper, I discuss why North Korea has taken this diplomatic turn and what can be learned from it in terms of its strategic game plan by briefly analyzing the Kim Jong Un regime's grand and military strategy as well as the regime's diplomatic

[1] "DPRK Gov't Statement on Successful Test-fire of New-Type ICBM", *Korean Central News Agency*, November 29, 2017.

moves to date through the first-ever US-DPRK (Democratic People's Republic of Korea) summit meeting in Singapore on June 12 and the series of North-South meetings since the signing of the Panmunjom Declaration on April 23, 2018.

NORTH KOREA'S ULTIMATE STRATEGIC GOAL TOWARD THE UNITED STATES

North Korea's constitution suggests that the country's ultimate goal is the realization of Korean reunification on its own terms. Other official statements indicate its grand strategic goals are 1) becoming a strong and prosperous nation and 2) ending America's hostile policy. The ongoing *Byungjin* policy, or new strategic line, remains the primary means to achieving those goals[2].

Kim Jong Un's strategic goal, reiterated in his New Year's address, is to possess a "powerful and reliable war deterrent" against the United States[3]. What this means, in my view, is to possess the capability to 1) deter US military attacks not only in the nuclear dimension but in the conventional dimension as well, 2) drive US forces out of South Korea by replacing the armistice with a peace treaty with the United States, and 3) pave the way for a North-led unification of the divided Korean Peninsula. It is now obvious that the major distinction between the Kim Jong Un regime and previous North Korean regimes is that it has accelerated the pace of nuclear and missile development since 2012 toward its ultimate goal.

However, North Korea's most immediate policy priority appears to be to make its status as a nuclear weapons state a fait accompli by forcing the United States (and the rest of the world as well) to accept it as an undeniable reality while continuing to actually possess a "powerful and reliable war deterrent" against the United States[4]. This is substantially the precondition for a dialogue that North Korea has put forward to the United States. The first-ever summit meeting with the United States and North Korea can be seen as a de facto US acknowledgment of North Korea as a nuclear weapons state at least, even if the United States officially denies it, because what matters more to North Korea is not the US denial in this case but North Korea's

[2] The grand and military strategies of North Korea under the Kim Jong Un regime were intensively discussed at the 2017 NDA-FOI Joint Seminar. See Hiroyasu Akutsu, "North Korea's Nuclear and Missile Threats and Their Impact on Japanese Security", *The Future of East Asian Security*, Global Security Seminar Series No. 1, Center for Global Security, National Defense Academy, October 2017.

[3] Kim Jong Un, "New Year Address", *Korean Central News Agency*, January 1, 2018.

[4] Akutsu, "North Korea's Nuclear and Missile Threats and Their Impact on Japanese Security".

own interpretation of the US response and utilization of the summit meeting for its further domestic regime legitimation. In addition, from the perspectives of extended deterrence and non-proliferation, the US accommodation with North Korea is highly contentious, while Japan, its key ally in Northeast Asia, is still faced with serious missile threats from North Korea.

Kim Jong Un's 2018 New Year's address only confirms that there is no change in North Korea's intention to enhance its nuclear and missile capabilities. The address can be summarized into the following points regarding the country's nuclear and missile strategy toward the United States:

> -Last year the moves of the United States and its vassal forces to isolate and stifle our country went to extremes, and our revolution faced the harshest-ever challenges.
> -On this platform one year ago I officially made public on behalf of the (Korean Workers') Party and government that we had entered the final stage of preparation for the test launch of an ICBM. In the past year we conducted several rounds of its test launch, aimed at implementing the program, safely and transparently, thus proving before the eyes of the world its definite success.
> -By also conducting tests of various means of nuclear delivery and super-intense thermonuclear weapons, we attained our general orientation and strategic goal with success, and our Republic has at last come to possess a powerful and reliable war deterrent, which no force and nothing can reverse.
> -Our country's nuclear forces are capable of thwarting and countering any nuclear threats from the United States, and they constitute a powerful deterrent that prevents it from starting an adventurous war.
> -In no way would the United States dare to ignite a war against me and our country. The whole of its mainland is within the range of our nuclear strike, and the nuclear button is on my office desk all the time. The United States needs to be clearly aware that this is not merely a threat but a reality.
> -The nuclear weapons research sector and the rocket industry should mass-produce nuclear warheads and ballistic missiles, the power and reliability of which have already been proved to the full, to give a spur to the efforts for deploying them for action.
> -We should always be ready for an immediate nuclear counterattack to

> cope with the enemy's maneuvers for a nuclear war[5].

Although Kim Jong Un clearly recognizes the international sanctions that are in place as difficult challenges, they may have been alleviated as some major countries have failed to comply with UN Security Council (UNSC) resolutions. It may be true, on the one hand, that North Korea's efforts to acquire goods and energy from foreign cargoes on the sea is evidence of the mounting hardship caused by those international sanctions, but, on the other, North Korea can still enjoy loopholes in the sanctions as the support from China and Russia virtually continues. The ongoing diplomatic peaceful atmosphere could work for North Korea despite the efforts by Japan and like-minded members of the international sanction regime to maintain the sanctions on North Korea.

Despite the commitment, or more correctly the lip service, to "complete denuclearization" in the Singapore Joint Statement in June, North Korea has been reluctant to do so and appears to be using the dialogue process to buy time for at least the maintenance of and further development of its nuclear and missile capabilities by arguing against the US unilateral demand for North Korea's action and playing the card of the return of the remains of former US soldiers in the Korean War with a view toward the upcoming mid-term Congressional elections in the United States.

On April 21, North Korea confirmed that the country had achieved "the state nuclear force" and declared the victory of the *Byungjin* strategic line, while committing itself to the continuation of economic development at the Third Plenary Meeting of the Seventh Central Committee[6]. He stated in his report at the meeting:

> [T]he overall situation is rapidly changing in favor of the Korean revolution thanks to the DPRK's initiative action and efforts after the declaration of completing the state nuclear force last year… (The miraculous victory of having perfectly accomplished the great historic cause of building the state nuclear force in a short span of less than five years is the great victory of the WPK's line of simultaneously pushing forward the economic construction

[5] Kim, "New Year Address".
[6] "The Third Plenary Meeting of the Seventh Central Committee of the Workers' Party of Korea", *Korean Central News Agency*, April 21, 2017.

and the building of a nuclear force and, at the same time, a brilliant victory that could be won only by the heroic Korean people[7].

NORTH KOREA'S TACTICAL TURN

Regarding North Korea's approach to South Korea, the North rejected through its silence all of South Korea's offers for inter-Korean dialogues in 2017. Why is North Korea now trying to reach out to South Korea? Before analyzing this shift, it is useful to see how "nicely" Kim Jong Un approached South Korea in his New Year's address. The most notable remarks are as follows:

-Even though the conservative "regime" in South Korea, which had resorted to fascist rule and confrontation with our fellow countrymen, collapsed and the ruling circles were replaced by another thanks to the massive resistance by the enraged people of all walks of life, nothing has been changed in the relations between the North and the South.... We can never escape the holocaust of a nuclear war forced by outside forces, let alone achieve national reunification, unless we put an end to this abnormal situation.

-This year is significant both for the North and the South as in the North the people will greet the seventieth founding anniversary of their Republic as a great, auspicious event, and in the South the Winter Olympic Games will take place.

-First, we should work together to ease the acute military tension between the North and the South, and create a peaceful environment on the Korean Peninsula.

-As long as this unstable situation – which is neither wartime nor peacetime – persists, the North and the South cannot ensure the success of the scheduled events, nor can they sit face-to-face to have a sincere discussion on the issue of improving bilateral relations, nor will they advance straight toward the goal of national reunification.

-The South Korean authorities should respond positively to our sincere efforts for a détente, instead of inducing the exacerbation of the situation by joining the United States in its reckless moves for a North-targeted nuclear war that threatens the destiny of the entire nation as well as peace and stability on this land. They should discontinue all the nuclear war drills

[7] *Ibid.*

> they stage with outside forces, as these drills will engulf this land in flames and lead to bloodshed on our sacred territory.
>
> -Even though the United States is wielding the nuclear stick and going wild for another war, it will not dare to invade us because we currently have a powerful nuclear deterrent. And when the North and the South are determined, they can surely prevent the outbreak of war and ease tension on the Korean Peninsula[8].

The above statements provide some ostensible reasons for North Korea's shift in its approach to South Korea. In my view, there may be at least two major factors. First, although Kim Jong Un suggests that the imposed economic sanctions are obvious challenges, his regime can still have some breathing space due to many known and unknown loopholes and blind spots in the sanctions. Rather, mounting US military pressure around the Korean Peninsula must have had a greater impact on North Korea. The United States has increased its military presence by deploying its strategic and tactical assets near the Korean Peninsula. North Korea probably found it too risky to further launch provocative missiles amid such heavy military pressure by the United States, at least until there occurs another chance to resume the missile launches[9]. Of course, this is not to deny the possibility of North Korea's launch of another ballistic missile disguised as a space satellite launch for scientific purposes[10].

Second, after observing the behavior of the new administration in South Korea during the year, Pyongyang has seen an opportunity to take advantage of the administration's "pro-DPRK" nature and to drive a wedge in the ROK-US alliance. To be sure, North Korea may have seen the collapse of the Park Geun-hye administration and the emergence of the Moon Jae-in administration as an even greater opportunity because the latter is a progressive administration that is more accommodating to the North. In fact, the Moon administration has embarked on a political program to indict and arrest former officials of both the Park administration and the Lee Myung-bak administration on charges such as corruption and abuse of

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[8] Kim, "New Year Address".

[9] Phil Stewart, "U.S. bombers fly off North Korea's coast in show of force", *Reuters*, September 24, 2017; Christine Kim, "North Korea's bark may be worse than bite in threat to shoot down U.S. bombers", *Reuters*, September 27, 2017.

[10] Such a launch would be conducted in a way North Korea considers less provocative to the international community.

power. The Moon administration also proposed to North Korea the resumption of various levels of dialogues despite the North's "rejection" in the form of silence. Mr. Moon has also publicly been opposed to US unilateral military action on North Korea. Finally, the Moon administration decided to resume humanitarian aid to North Korea on September 14, 2017, although the decision has been held back due to North Korea's launch of the missile on the following day. The Moon administration's de facto political pressure on the conservative camp, or "積弊清算" (*jokbyungchongsan*), has continued to date. Simply put, North Korea may have judged that South Korea has "passed" its test.

Thus, North Korea probably decided that it was time to test South Korea to see if it could get as much as it could from South Korea without agreeing to abandon its nuclear program and also by driving a wedge in the ROK-US alliance. The diplomatic process following this has seemed to confirm my assessment.

REVISITING NORTH KOREA'S LIMITED "DETERRENCE" AGAINST THE UNITED STATES

Kim Jong Un claims that North Korea already attained its goal of possessing nuclear-ICBM capability in 2017 and that the country will accelerate the mass production of nuclear warheads and ballistic missiles and deployment of them for action. However, while Hwasong 15 missiles may potentially be capable of striking targets as far away as Washington, DC, North Korea may still need to further improve the reentry capability[11]. This is not to underestimate the country's actual capacity. On the contrary, it should be noted that their past behavior indicates that whenever North Korea sees a chance to resume more provocative testing, it will likely do so.

The likely limit of North Korea's nuclear deterrence raises a fundamental question of what is the nature of the country's "deterrence" against the United States. The source of such deterrence continues to be the military situation in the northern part of the demilitarized zone (DMZ). There has been intensive discussion on the capabilities, scenarios, and consequences of US military strikes on North Korea[12]. However, the constant and most crucial factor has continued to be the conventional

[11] *Independent*, December 4, 2017.
[12] See, for example, Kathleen J. McInnis et al., "The North Korean Nuclear Challenge: Military Options and Issues for Congress", *Congressional Research Service*, November 6, 2017.

military situation over the DMZ. Specifically, the hundreds and thousands of the North Korean artillery tubes deployed near the DMZ could still make the major part of Seoul "a sea of fire[13]". In 1994, US and ROK (Republic of Korea) military assessments concluded that within the first 12 hours of artillery firing over the DMZ, a considerable number of US and ROK military personnel would be victimized as well as there would be massive civilian causalities in Seoul[14]. Even today, the US Department of Defense, according to a recent report by the RAND Corporation, has estimated that artillery barrages could inflict 250,000 casualties on Seoul[15]. The report also points out that in a single ten-minute barrage, North Korea could fire close to 5,000 long-range artillery rounds into downtown Seoul and 25,000 artillery rounds on the Seoul metropolitan area[16].

Furthermore, given the past 24 years of North Korea's military technological development, the recent numbers of casualties are much higher. According to a South Korean member of parliament, there would be approximately 60,000 casualties a day in the first week of North Korean artillery attacks, and it would take the South Korean military three days to eliminate the artillery, with the number of casualties amounting to 400,000 in the South Korean capital area[17]. Additionally, North Korea may have enhanced at least its artillery batteries over the past few years[18].

For South Korea, fear of war with North Korea is not the only fear. South Korea has long been under the threat of North Korean conventional weapons as well as various

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[13] Roger Cavazos, "Mind the Gap between Rhetoric and Reality", *NAPSNet Special Report*, June 26, 2012. https://nautilus.org/napsnet/napsnet-special-reports/mind-the-gap-between-rhetoric-and-reality/; Prakash Menon, "North Korea Can't Destroy Seoul with Artillery", *The National Interest*, January 5, 2018. https://nationalinterest.org/feature/north-korea-cant-destroy-seoul-artillery-23964; Kathleen J. McInnis, Andrew Feickert, Mark E. Manyin, Steven A. Hildreth, et al., *The North Korean Nuclear Challenge: Military Options and Issues for Congress*, Congressional Research Service, November 6, 2017. https://fas.org/sgp/crs/nuke/R44994.pdf.

[14] Gary Luck and William Perry, *Testimony to the Senate Foreign Relations Committee*, January 25, 1995; Don Oberdorfer, *Two Koreas: A Contemporary History*, South Bend, The Better World Books, 1997, pp. 313–315.

[15] Michael J. Mazarr, Gian Gentile, Dan Madden, Stacie L. Pettyjohn et al., "The Korean Peninsula: Three Dangerous Scenarios", *Perspective*, RAND Corporation, 2018, p. 12. https://www.rand.org/content/dam/rand/pubs/perspectives/PE200/PE262/RAND_PE262.pdf

[16] *Ibid*., pp. 11–12.

[17] Cho Wi-jun, "US Government says North Korean Long-Range Artillery Attacks Kill 60 Thousand South Korean Lives a Day", *Chosun Ilbo*, October 27, 2017.

[18] Kathleen J. McInnis, Andrew Feickert, Mark E. Manyin, Steven A. Hildreth, et al., *The North Korean Nuclear Challenge: Military Options and Issues for Congress*, p. 16.

types of missiles. From North Korea's perspective, South Korea, as a US ally, has been a useful "hostage" against the United States. For South Korea, "abandonment" or "decoupling" by the United States is another serious concern. Since the failed attempt to withdraw US forces from South Korea by the Carter administration, "decoupling" has remained a nightmarish scenario.

For North Korea, South Korea is no longer the only "hostage". With the development of its missile capabilities, North Korea finds it tactically and politically useful to launch different ranges of missiles toward Japan and the United States to drive a wedge in the Japan-United States alliance.

Finally, if North Korea's other offensive capabilities, including cyber-attacks, were combined, the actual military and geopolitical consequences would be more complicated. Thus, even nonnuclear military scenarios could involve massive causalities and economic costs on both sides if war started[19].

To sum up, North Korea's capability to make Seoul "a sea of fire" continues to be the country's essential source of limited "deterrence" against the United States as well as South Korea. For North Korea, while maintaining that capability, possessing complete nuclear deterrence power against the United States would remain its most urgent goal, if the country had not yet achieved it despite its claim.

A Future Prospect

Whether or not North Korea has really gained such a capability, the United States has already agreed to "freeze" some of its military exercises with South Korea and also to begin talks with the North while maintaining the existing financial and economic sanctions. It is still unclear whether North Korea has really achieved "the state nuclear force" against the United States. Technologically speaking, North Korea might not have gained a stable and reliable capability to directly attack Washington with a nuclear-tipped ICBM. But North Korea may believe that it is only necessary to keep the United States guessing and make it hesitate in taking decisive action as long as North Korea can buy more time to complete "the state nuclear force". Given

[19] See, for example, James Holmes, "Could the U.S. Navy Destroy North Korea?", *The National Interest*, January 23, 2018; Dave Majumdar, "If Donald Trump Attacks North Korea: Beware of Kim's Air Defense Systems", *The National Interest*, January 23, 2018.

the regime's ultimate goal of becoming "a strong and prosperous nation", it would seek to accelerate the "prosperous" aspect of the goal according to the *Byungjin* policy, while at least sustaining its current nuclear weapons and missile capabilities. The ongoing diplomatic process seems to have confirmed this.

Although the United States has not made clear whether it sees North Korea as a de facto nuclear weapons state, judging from the decisions made at the Third Plenary Meeting of the Seventh Central Committee of the Workers' Party of Korea in April, North Korea has virtually been acting as "a responsible nuclear weapons state" and seems to have accepted the ongoing talks with the United States as "arms control negotiations" between two nuclear weapons states. With its status as a nuclear weapons state, North Korea is now pushing the United States to "make a war-end declaration" to formally terminate the Korean War, which is part of the Panmunjom Declaration[20]. Given that the Singapore Joint Statement is formally linked to the Panmunjom Declaration, South Korea has every reason to side with North Korea in demanding that the United States conclude such an agreement by the end of 2018. The geostrategic impact of such an agreement would be huge if the agreement were taken and used as a pretext for the dissolution of the United Nations Command or the withdrawal of US forces from South Korea. China and Russia would be the major beneficiaries of this scenario.

It remains to be seen how the current talks between Washington and Pyongyang will play out, but as of late August 2018, despite the North-South Panmunjom Declaration and the United States-North Korea Singapore Joint Statement, at least it seemed likely that North Korea's nuclear and missile program had not been frozen.

It should also be noted that the nuclear program is not the only weapons of mass destruction (WMD) program North Korea has invested in. Other programs include chemical and biological as well. North Korea would continue to enhance its chemical and biological weapons, cruise missiles, and offensive cyber capabilities as well. North Korea could also export its WMD as well as missile technologies despite its official statements.

CONCLUSION

[20] "War-end Declaration on Korean Peninsula Is Demand of Times", *Rodong Sinmun*, August 9, 2018.

North Korea has emphasized that it has taken a new strategic line to concentrate on economic development based on the successful achievement of the *Byungjin* strategic line. However, this does not mean that North Korea has decided to abandon its nuclear and missile program. As stated in the introduction to this paper, no official statement has been found to suggest such a decision. The *Byungjin* policy was taken in 2013 and originally was intended to promote both economic development and nuclear development in the first place. The only change is the shift in emphasis from nuclear to economic development. It should be noted that the emphasis can shift back anytime as well as the technical development of the existing offensive capabilities.

Regarding South Korea's accommodative response to North Korea, the most critical question would be how far South Korea aims to take its reconciliatory policy while maintaining a deterrence posture within the US-ROK alliance and ROK-US-Japan trilateral security cooperation the same time. South Korea is well aware that North Korea will not discuss the nuclear issue with the South, so it is unlikely that South Korea's accommodation with the North will lead to North Korea's denuclearization.

However, South Korea's accommodation with the North could work to North Korea's advantage and undermine the deterrence and extended deterrence posture by the United States and Japan. In this sense, North Korea's tactical "reconciliation" with South Korea could make a strategic impact depending on South Korea's future actions. South Korea's accelerated move to resume economic exchanges with the North is already affecting the psychological aspect of trilateral and multilateral efforts to maintain sanctions. This is probably where immediate policy implications should be drawn for the United States and Japan.

US Secretary of State Mike Pompeo already admitted to Congress that getting North Korea to dismantle its nuclear and missile programs would be a "decades-long challenge[21]". Instead of observing the situation through pessimistic lenses, this should be taken to add to the rational for enhancing the Japan-United States alliance coordination as well as Japan's own defense capabilities. Japan should take advantage of North Korea's de facto nuclear and missile test moratorium before the

[21] Jeremy Diamond, "Pompeo Says North Korea Denuclearization 'Decades Long' Challenge", *CNN*, July 9, 2018.

North begins to show an even more advanced capability, which would put Japan into an even more serious situation.

CHAPTER 6

ROK's Perception of and Posture toward the DPRK's Nuclear and Ballistic Missile Development

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INTRODUCTION

The Democratic People's Republic of Korea (DPRK; North Korea) has strengthened its nuclear capabilities. In particular, since its launch of a Hwasong-15 on November 29, 2017, North Korea has been expected to reach success with reentry technology, which is critical to an intercontinental ballistic missile (ICBM) capability. In addition, North Korea was able to succeed in its sixth test of a nuclear bomb in September 2017, which was regarded as a hydrogen bomb. The nuclear and missile development of North Korea has put neighboring countries, including the Republic of Korea (ROK; South Korea), in a quite uncomfortable situation.

The North Korean nuclear and missile programs have become a major threat to the regional security architecture. The national security strategy of the United States has stipulated that North Korea is a main component of the adversary groups that undermine US homeland security[1]. Japan has been trying to acquire capabilities to deal with incoming North Korean nuclear-tipped missiles to its territory. China and Russia, though reluctant, are figuring out measures to maintain a nonproliferation regime. Of course, South Korea, under direct threat from North Korean nuclear ambitions, is seeking defensive measures, as represented in the deployment of the terminal high altitude area defense (THAAD) system. Without proper intervention by the international community, North Korea will continue to pursue the status of a nuclear-armed state. This may lead to a disaster for regional stability.

[1] *National Security Strategy of the United States*, December 2017, pp. 7-8. www.whiteh ouuse.gov/wp-content/uploads/2017/12/NSS-Final-12-18 (Accessed on December 19, 20 17)

In this regard, it is necessary to assume the worst situation: facing a nuclear-armed North Korea in the near future and devising ways to maintain security in Northeast Asia. To cope with a nuclear-armed North Korea, it is necessary to analyze precisely North Korean nuclear capabilities as well as the intentions of North Korea. At the same time, to devise ways for South Korea to counter the North Korean nuclear threat in the future security environment, it is critical to predict accurately the behavior of other countries in Northeast Asia.

This paper attempts to examine South Korea's posture for dealing with a nuclear-armed North Korea. To this end, the paper examines North Korea's rhetoric regarding nuclear and ballistic missile development to determine that country's real intentions. At the same time, this paper sheds light on North Korea's nuclear doctrine and the command and control structure of the North Korea Strategic Force to get a sense of the country's operational posture. In addition, the paper offers a rough estimate of neighboring countries' attitudes in dealing with a nuclear power, that is, North Korea. As a conclusion, this paper discusses strategic considerations and makes policy recommendations for South Korea.

NORTH KOREAN NUCLEAR DEVELOPMENT

It is still unclear when North Korea possessed its first nuclear bomb. Based on sources, it could be the early 1990s or early 2000s. Hwang, Jangyeop mentioned to Voice of America that "he heard from Secretary Jeon, Byungho, who was in charge of nuclear development, that they already finished creating nuclear bombs and were waiting for the order of Kim Jong-il to test it before the 1994 Agreement with the US[2]". Another source for the argument that the DPRK already possessed a nuclear bomb in the 1990s comes from Dr. Abdul Qadeer Khan. As is known, he visited North Korea in 1999 to transfer the technology of enriching uranium using centrifuges. He later testified that he saw three perfect nuclear devices in an underground nuclear facility near Pyongyang[3].

[2] "N. Korea Defector Says Pyongyang Had Nuclear Weapons before 1994 Agreement with the U.S.", *Voice of America*, June 20, 2004. http://www.voanew.com/articleprintview/261597.html (Accessed December 23, 2017)

[3] "Pakistani Scientist Depicts More Advanced Nuclear Program in North Korea", *The Washington Post*, December 28, 2009. http://www.washingtonpost.com/wp-dyn/contest/article/2009/12/27/AR200912270125.html (Accessed December 22, 2017)

North Korean diplomats began mentioning their nuclear program starting in April 2003 at meetings with Americans. Lee, Geun, head of the North Korean delegation and deputy director of the America Bureau of the Department of Diplomacy of the DPRK, asserted that the DPRK already had nuclear bombs, and that they would not dismantle them. Furthermore, the North Korean government would conduct nuclear tests or export them based on US actions to reduce tension between the two countries[4]. Even at the keynote speech made at the first meeting of the Six Party Talks, on August 27, 2003, the North Korean representative argued, "If the US continually forces North Korea to denuclearize itself first, North Korea will not give up its nuclear capability but will only strengthen it[5]".

North Korea has artfully maneuvered to reveal its nuclear program, test nuclear devices, and announce its nuclear doctrine and laws. All these efforts were well orchestrated as part of a North Korean national strategy to serve its national goal: being a nuclear state. These efforts involve rhetoric, cheating, bullying, military surprise, and domestic politics. The whole process consists of North Korean threats and illegal tests, consequential criticism from international community and sanctions, and the advancement of North Korean nuclear capabilities. This will be recorded as the failure of nonproliferation efforts and the success of the North Korean scheme.

North Korea proclaimed itself a nuclear power on February 10, 2005, amid the Six Party Talks and announced a boycott of the dialogue that would have no limit. Twenty months after the announcement, North Korea conducted its first nuclear test on October 9, 2006. In fact, the participants in the Six Party Talks tried to restrain North Korea by convening the fourth talks in July 2005 and later in September 2005. At the dialogue, the U.S. and North Korea reached an agreement and announced a "9.19 communiqué", but failed to prevent the first test. The North Korean test seemed to be an attempt to resist a US sanction over BDA to cut the flow of money to North Korea.

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[4] Victor Cha and David Kang, "The Debate over North Korea", *Political Science Quarterly* 119.2, 2004, pp. 229-254.

[5] "Jomisaiui Haekmoonjeedaehan 6jahoidam gaechoi—Joseonchok Ilgwaltagyul Dosikgwa Dongsihaengdongsunseo Jesi [The Opening of the Six Party Talks to Tackle the Nuclear Problem between North Korea and the U.S.—North Korea Suggested Options and Action Plans for a Package Deal], *Joseon Joongantongsin*, August 30, 2003.

North Korea's second nuclear test was conducted on May 25, 2009. After the test, North Korea began to disclose its uranium enrichment program. In September 2009, Shin Seon-ho, North Korean ambassador to the UN, said that the enrichment process was in its final stage[6]. Later, as is well known, North Korea opened a uranium enrichment facility to Siegfried S. Hecker in November 2010. According to Hecker, the Yongbyon facility, equipped with 2,000 centrifuges, was supposed to produce low-enrichment uranium[7]. One month after that visit, the North Korean state-run newspaper *Rodongsinmun* reported in an article on December 29, 2010, that a modern uranium enrichment facility was operating under normal conditions to provide fuel to the light reactor.

North Korea moved quickly to make itself a de facto nuclear state after the two nuclear tests. The first attempt involved publishing a diplomatic memorandum to proclaim itself a nuclear power with newly developed nuclear policies on April 21, 2010[8]. This effort was made in a stronger way in April 2012, when North Korea published articles in its constitution describing itself as a nuclear state[9]. In addition, in a long memorandum written in August 2012, North Korea elaborated on its reasons for building up its nuclear capabilities: the U.S.' continuous anti-North Korean policy[10]. The memorandum predicted that North Korea would continue its efforts to develop advanced nuclear weapons, and that the North's nuclear deterrence against the U.S. would be empowered unless the U.S. abandoned its hostile policies toward North Korea[11]. More importantly, North Korea began to change its priority from denuclearization to the forming of a peace treaty[12].

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6 "UN Joseon Sangimdaepyo Anbori Euijangege Pyonji [Letter from North Korean Ambassador to the Secretary of the UNSC]", *Joseon Joongantongsin*, September 4, 2003.

7 Siegfried S. Hecker, "A Return Trip to North Korea's Yongbyon Nuclear Complex", *Center for International Security and Cooperation*, Stanford University, November 2010. http://iis-db.stanford.edu/pubs/23035/HeckerYongbyon.pdf (Accessed December 26, 2017)

8 "Joseon Oemusong Bimangrok [A Memorandum of North Korean Department of Foreign Affairs]", *Joseon Joongantongsin*, April 21, 2010.

9 "Sahoejuui Heonbob Bochoong [The Amendment of the Socialist Constitution]", *Joseon Joongantongsin*, April 13, 2012.

10 "Joseon Oemusong Bimangrok — Migukui Jeokdaesi Jeongcheakeun Haekmunje Haegyului Gibonjangae [A Memorandum of North Korean Department of Foreign Affairs — The U.S. Anti-North Korea Policy is the Basic Obstacle to Solve the Nuclear Problem]", *Joseon Joongantongsin*, August 31, 2012.

11 *Ibid.*

12 "Joseon Oemusong Seongmyong Pyunghwahoidameul Jeui [The Announcement of North Korean Department of Foreign Affairs: Suggestion of a Peace Talk]", *Joseon Joongantongsin*, April 21, 2010.

The third nuclear test by North Korea was used to prove its nuclear capabilities. Starting on February 12, 2013, North Korean news reports repeatedly emphasized the success of a miniaturized and lightened atomic bomb test that would enable North Korea to launch a precise attack to destroy any of its enemies in the world. At this point, North Korea described its nuclear bomb as having "diversified capabilities". The exact meaning of diversified nuclear deterrence or diversified precise attack methods was not clear; however, many experts believed that meant a uranium bomb. In a larger sense, following the third test, North Korea seemed to consolidate its nuclear state status, which would not compromise on denuclearization by arguing that it had had success with a diversified miniaturized and light atomic bomb.

In terms of domestic politics, North Korea achieved a national consensus for maintaining its nuclear development policy by publishing Byungjin Noseon, a parallel policy on March 31, 2013[13]. It argued that nuclear bombs were not negotiable, that North Korea would possess nuclear capabilities permanently based on laws, that nuclear capabilities would be continually enhanced as well as delivery vehicles, and that a strategy for employing nuclear weapons in war would be developed[14]. The next day, North Korea adopted a new law, entitled "Jawijeok Haeckboyouguk Jiwirul Deouk Gongohi Hal De Daehan Beobryoung" [A Law to Consolidate the Status of a Defensive Nuclear State], which defined the goal of nuclear capabilities, missions, command and control, management, and doctrines in ten articles[15]. Since then, North Korea has conducted three more nuclear tests up to September 2017. All three tests aimed to enhance the ability of thermonuclear warheads, as was suggested by Kim Jong-un in December 2015[16]. The final step in the North Korean process of becoming a nuclear state was the convening of the Seventh Labor Party convention in May 2016.

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[13] "Joseon dang Joongangwi 2013nyon 3wol Jeonwonhoiui [A Plenary Meeting of Central Committee of Joseon Workers' Party in March 2013]", *Joseon Joongantongsin*, March 31, 2013.
[14] *Ibid.*
[15] "Jawijeok Haeckboyouguk Jiwirul Deouk Gongohi Hal De Daehan Beobchetaek [Adopting a Law to Consolidate the Status of a Defensive Nuclear State]", *Joseon Joongantongsin*, April 1, 2013.
[16] "Gyungaehanun Kim Jong Un Dongjikeseo Saero Gaegundoin Pyungchon Hyukmyung Yujeokjirul Hynjijidohaseyotta [Respected Leader Kim Jong Un Visited Pyungchon Revolutionary Memorial Site and Made Directions]", *Rodong Sinmun*, December 10, 2015. Detailed requirements for nuclear capabilities were explained in "Haekmoogiui Sohyonghwa, Gyungryanghwa, Dajonghwa, Jeongmilhwa [Miniaturizing, Lightening, Diversifying, and Accurizing Nuclear Bombs]", *Joseon Joongantongsin*, May 21, 2013.

NORTH KOREAN MISSILE DEVELOPMENT

North Korea has pursued long-range missile capabilities to deter South Korea, Japan, and the U.S. North Korea deployed Scud Bs and Scud Cs, aiming them at South Korea, in the mid-1980s and targeting Japan in the late 1990s. Interestingly, North Korea put the mobile intermediate-range ballistic missile Musudan in operational status without tests in 2007, though it was highly reliable because it was the same model as the old Soviet R-27 submarine-launched ballistic missile. The Musudan has a range of 3,000–4,000 km, meaning it can reach Guam. Superficially, within three decades of developing missiles, North Korea has become able to deter three countries with its missiles.

North Korea has sought multitracks to complete its ICBM program. First, North Korean scientists used Rodong missiles as a base engine to compose two- or three-stage missiles. The Taepodong-1 and -2 (Unha- 3) are Rodong-based missiles. The Rodong was used for first- or second-stage engines. North Korea had used the missile for a long time, and as a result was able to understand its technical characteristics. The Rodong has its origin in the Scud, which has a limited range and payload. Although North Korea launched the Unha-3 in December 2012 and April 2016 and achieved a successful result, North Korea would need more solid delivery vehicles for their nuclear warheads with heavier payloads. The answer was to use the R-27 or SS-N-6 with the assistance of former members of the Makayev Design Bureau[17]. Its 4D10 engine, which used unsymmetrical dimethyl hydrazine and nitrogen tetroxide, was adopted to develop the KN-08 and KN-14, which were not test-fired yet. Interestingly, North Korea fired eight Musudan missiles but succeeded only one time, in June 2016[18]. This may suggest that North Korea sought another solution to meet its requirements.

The third path was to develop the ICBM based on the Soviet Union's old RD-250 engine. The new engine gave North Korea more reliable missile capabilities in terms of range and payload. The country achieved major developments in new types of missiles in 2017. The Hwasong 12 was successfully launched on May 14,

[17] Missilethreat, CSIS Missile Defense Project, KN-08. https://missilethreat.csis.org/missile/kn-08/ (Accessed January 3, 2018)
[18] Missilethreat, CSIS Missile Defense Project, Musudan. https://missilethreat.csis.org/missile/musudan/ (Accessed January 3, 2018)

2017, and showed stable flight performance in two successful consecutive launches. Its engine has 45–47 tons of power supported with four Vernier engines, which can shoot the missile to more than 6,000 km with a 500-kg warhead[19]. Before the launch, North Korea conducted ground engine tests three times. Using the Hwasong 12 engine, North Korea manufactured the Hwasong 14 missile, which can reach 10,000 km with a 400-kg warhead. In addition, North Korea developed the Hwasong 15, which is believed to have a gimballed engine, that is, two bundled Hwasong 14 engines, for its first stage[20]. The Hwasong 15 reached an apogee of 4,500 km and flew 960 km. Based on the trajectory, experts believe that the Hwasong 15 can fly to 13,000 km, putting the entire US continent within range.

North Korea created a special unit to organize its missile capabilities. Kim Jong-un announced a "Strategic Rocket Force" during his first public speech on the occasion of Kim il-Sung's one-hundredth birthday memorial parade on April 15, 2012. The unit was an independent organization under the direct command of the Committee of Defense Affairs via the General Headquarters[21]. Later, in March 2014, the unit changed its name to Strategic Force. With the establishment of a specific unit, North Korea revealed that its nuclear doctrine would affect the operation of the Strategic Force. On April 1, 2013, North Korea's Supreme People's Committee adopted a law entitled "Jawijeok Haeckboyouguk Jiwirul Deouk Gongohi Hal De Daehan Beobryoung" [A Law to Consolidate the Status of a Defensive Nuclear State], which stated that the purpose of its nuclear weapons is to deter attacks from outside, to repel attacks, and to retaliate against aggression[22].

The North Korean nuclear doctrine should be understood in a stricter sense. Although the law insists that Pyongyang would use the bombs to deter enemies, to repel aggression, and to retaliate, North Korean officials have frequently mentioned that they would employ the bombs for preventive attacks against the U.S.[23] In

[19] Michael Elleman, "The Secret to North Korea's ICBM Success", *IISS Voices*, August 14, 2017.
[20] Missilethreat, CSIS Missile Defense Project. https://missilethreat.csis.org/missile/wasong-15-kn-22/(Accessed January 3, 2018)
[21] ROK Ministry of National Defense, *Defense White Paper 2016,* Seoul, Ministry of National Defense, 2016, p. 23.
[22] "Jawijeok Haeckboyouguk Jiwirul Deouk Gongohi Hal De Daehan Beobchetaek" [Adopting a Law to Consolidate the Status of a Defensive Nuclear State], *Joseon Joongangtongsin*, April 1, 2013.
[23] Lee, Su Yong (Minister of Foreign Affairs of the DPRK), *Rodong Sinmun*, March 6, 2015; Kim, Jong Un, *Rodong Sinmun*, March 9, 2016.

addition, Kim Jong-un ordered an increase in the role that nuclear arms could play in deterring foreign invasions and conducting wars with the development of new tactics employing nuclear bombs[24]. In this context, it is noteworthy that North Korea emphasized the production of small-size nuclear bombs less than 15kt to conduct modern war, which is complicated by the mixture of enemy and friendly forces[25], This means that North Korea would consider nuclear bombs as usable weapons in a practical sense.

ROK'S PERCEPTION OF THREATS AND A COUNTERSTRATEGY

The purpose of the nuclear program of North Korea may be twofold. North Korea has raised the U.S.' hostile policy toward it as a main cause for its developing nuclear capabilities[26]. Yet in fact, North Korea never defined the hostile policy of the U.S. However, the North Korea Department of Foreign Affairs described its intention to continue nuclear development by arguing that the U.S. tried to dismantle the North Korean regime in October 2014[27]. At the same time, North Korea compared its destiny with other countries that gave up nuclear programs, emphasizing the brilliance of the decision of its leadership in February 2013[28]. In this sense, North Korea's nuclear weapons can be regarded as a tool for preserving its regime.

However, North Korea has the intention of using the nuclear weapons to change the status quo on the Korean Peninsula. After the success of the Hwasong-15, the state-run *Rodongsinmun* argued in an article on December 9, 2017, that this strategic weapon would "protect the (right) of completing the conquering of territory (whole peninsula)[29]". North Korea threatened South Korea on March 7, 2013, that if a war

[24] "Joseondang Joonangwiwonhoe 2013nyon 3wol Jeonwonhoeuiegwanhan Bodo [Report on Joseon Party's Central Committee on March 2013]", *Rodong Sinmun*, April 1, 2013.
[25] "Haekmugiui Sohyunghwa, Gyengryanhwa, Dajonghwa, Jongmilhwa [The Miniaturization, Weight Lightening, Diversification, and Refinement of Nuclear Arms]", *Rodongsinmun*, May 21, 2013.
[26] Joseon Gukbangwi [DPRK Defense Committee], "Migukun Daejoseon Jeokdaesi Jeongchaekbuteo Cholwihayouya Halgeosida [The U.S. Should Stop its Hostile Policy to DPRK]", *Joseon Joongangtongsin*, October 12, 2013.
[27] Joseon Woemuseong [DPRK Department of Foreign Affairs], "Miguki Wooriui Gukgajedolul Muneoturiryohanun Isang Jeoseonbando Bihaekhwa Nonuinun Amuron uimido Oepsojige Duoiotta [As the U.S. Tries to Dismantle Our Country System, Denuclearization Debates Will Lose Its Meaning]", *Joseon Joongangtongsin*, October 4, 2014.
[28] "Haeksiheomun Ungdanghan Jajugowonui Haengsaui Gangjo", Nuclear Test Is the Emphasis on the Self-help Right]", *Joseon Joongangtongsin*, February 21, 2013.
[29] *Rodong Sinmun*, December 9, 2017.

broke out on the peninsula, it would be an all-out nuclear war, and made this claim right after the third nuclear test on February 12, 2013[30]. At this time, the North Korean government showed its desire to decouple the ROK-US alliance by saying that "our revolutionary power will conduct the right of nuclear prevention attack to the bases of invaders" on the occasion of KR-FE exercises[31].

The danger caused by North Korean nuclear capabilities could be furthered by related countries. China and Russia have not actively joined in international efforts to place sanctions on North Korea. Both countries seem to be more concerned about regional stability rather than addressing North Korean nuclear aggression. North Korea was able to maintain its fragile economy by exploiting loopholes created by the two countries while sneering at UN Security Council resolutions. In addition, the two countries may seek to pursue a decrease of American influence in the region by allowing North Korea to achieve success in the nuclear challenge. China and Russia would take the advantage of a U.S.–free Northeast Asia.

Another problem is the US response to North Korean nuclear provocation. Unlike the relations between the U.S. and Russia, or the U.S. and China, the U.S. does not have a robust communication channel that can prevent the misperception of North Korean intentions. As a result, it is conceivable that the U.S. may conduct a preventive attack on North Korea based on wrong information, which may bring a catastrophe in the region.

To deal with this situation, South Korea should adopt a well-devised strategy. First, no measure can be a panacea under these circumstances. South Korea should use time as a major tool to get a window of opportunity by managing this uncomfortable situation with patience. In this context, the goal of the strategy would be preventing change in the status quo in the form of either North Korean armed provocations or negotiation efforts by Pyongyang. The other goal of the South Korean strategy should be to avoid decoupling by strengthening the ties between the two countries. The means of this strategy would be use of the military and nonmilitary assets of South Korea and the ROK-US alliance. Finally, South Korea

[30] "Joseon Oemuseong Haek Seonjetagyuk Gwonri Haengsahagedoelgusida [The Right of Nuclear Prevention Attack Will Be Conducted]", *Joseon Joongangtongsin*, March 7, 2013.
[31] "Joseon Choegoinmingun Saryongbu Joseon Jeongjeonhyupjeongul Wanjeonhi Baekjihwa [The Supreme Command of DPRK People's Army Nullified the Armistice Treaty]", *Joseon Joongangtongsin*, March 5, 2013.

should strengthen its military capabilities by focusing on the area of countering weapons of mass destruction. As a result, South Korea should maintain the status quo, intervene to give a clear understanding of North Korean intentions to the U.S., and prevent decoupling. If South Korea succeeds in carrying out this strategy, it may have a chance to change the situation on its own terms.

In terms of a counter-nuclear policy, South Korea should adopt a more flexible stance regarding a red line for dealing with North Korean nuclear development. If South Korea sticks to the red line, it will be in a difficult position due to the obscure definition of the red line and the urgency that is inherent in the term to take some measures to prevent further developments. Instead of the red line, South Korea may apply a red area for dealing with North Korean nuclear movement. A red area will allow South Korea more time and flexibility to devise measures in the long term. Second, given North Korea's active nuclear doctrine for employing nuclear weapons as a major tool of modern warfare, South Korea should develop details of ROE to avoid the unnecessary escalation of limited conventional conflicts to a nuclear war. Finally, South Korea should find ways to enhance cooperation with Japan, which faces the same threat and has advanced capabilities.

CHAPTER 7

North Korea's Threat and Japan's Response

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INTRODUCTION

North Korea's nuclear and ballistic missile development has posed a serious regional security challenge since the 1990s. Likewise, the international community made significant efforts to block their development, such as the 1996 framework agreement, the 2005 denuclearization agreement and multiple United Nations Security Council Resolutions. Regarding their current stage of development, the 2017 version of Japan's Defense White Paper assesses that it is possible that North Korea has achieved the miniaturization of nuclear weapons and has developed nuclear warheads[1].

Combining Kim Jong-Un's highly provocative behaviors, their development of escalation ladder is posing serious threats to the regional security environment. Now, regional countries need to seriously prepare for a nuclear crisis or even associated contingencies living within a strong nuclear shadow. Regarding this grave security situation in East Asia, this paper attempts to tease out the strategic implications of North Korea's nuclear escalation ladder and Japan's and the Japan-U.S. alliance's response to it.

[1] Ministry of Defense, *Defense of Japan of 2017*, Ministry of Defense of Japan, 2017, p.64. http://www.mod.go.jp/e/publ/w_paper/pdf/2017/DOJ2017_1-2-2_web.pdf

STRATEGIC GAME-CHANGING EFFECT OF NORTH KOREA'S NUCLEAR ESCALATION LADDER.[2]

In this region, the Japanese Archipelago has great geostrategic significance. One clear example of its strategic significance was the Korean War in 1950. During that war, when North Korea took initiative initially, the U.S. was forced to retreat to the Busan area. However, that situation was fundamentally overturned by the Inchon landing operation that outflanked the main body of North Korea's armies and took the initiative back. This Inchon Operation was launched from Japan. And not just this, throughout the Korean War, the Japanese Archipelago played an indispensable role for the U.S. to defend South Korea. (Since Japan was under occupation at that time, this "Japan" means the geographical, rather than political entity). Douglas MacArthur, the Commander of the United Nations Command located its headquarters in Tokyo. Bases in Japan were used for strategic bombing of North Korea. And Japanese industry provided huge logistical and maintenance support for U.S. forces and other militaries joining the UNC.

This geostrategic landscape illustrated in the Korean War, in which the combat occurred only within the Korean Peninsula, and which did not directly affect the Japanese Archipelago, and in which Japan was utilized as a safe staging area and also played a supporting role, continued to exist until recently.

This traditional geostrategic landscape in Northeast Asia has been changing significantly, as a result of North Korea's deployment of nuclear weapons and missiles. Since the 1990s, North Korea has developed various ballistic missiles, some of which, such as the *Nodong* are medium-range missiles whose range covers significant parts of Japanese territory. Since its first nuclear test in 2006, North Korea has conducted six nuclear tests as of the beginning of 2018. Their goal is obvious: developing small nuclear warheads to load onto ballistic missiles. The

[2] For more detailed analysis, please see Sugio Takahashi, "Thinking about the Unthinkable: The Case of the Korean Peninsula," in Aaron L. Friedberg, Robert Jervis, J. James Kim, Jina Kim, Matthew Kroenig, Sugio Takahashi, Michito Tsuruoka, and Christopher Twomey, "North Korea and Asia's Evolving Nuclear Landscape: Challenges to Regional Stability," NBR Special Report, No.67, August 2017. http://www.nbr.org/publications/specialreport/pdf/Free/10012017/SR67_North_Korea_and_Asias_Evolving_Nuclear_Landscape_August2017.pdf

question is whether, or more specifically when, they will succeed in it. While nobody knows the reality, the Japanese Ministry of Defense estimated that "it is possible that North Korea has achieved the miniaturization of nuclear weapons and has developed nuclear warheads" in their Defense White Paper of 2017[3]. This suggests that regional countries, and the U.S., need to be ready now to treat North Korea as capable of launching nuclear tipped ballistic missiles.

This development and potential deployment of nuclear tipped ballistic missile by North Korea does not only mean that North Korea acquires more lethal destructive measures with longer ranges. It actually has game changing effects in this region, because nuclear tipped ballistic missile provide strike options against Japan for North Korea. Obviously, was impossible during the Korean War, however, if a conflict breaks out on the Korean Peninsula, Japan will no longer be a safe staging area, unlike during the Korean War. Now, both the Korean Peninsula and the Japanese Archipelago would be a combat area in cases of the Korean Peninsula contingency. This means that Japan's decision making to support the U.S. forces on the Korean Peninsula and to permit use of bases in Japan for U.S. military operations on the Korean Peninsula, or even passage of Japanese territorial waters and airspace by U.S. military assets can be a highly contentious one, since the decision to ally with the U.S. would raise the risk that Japan might be attacked by nuclear tipped missiles from North Korea. On the flipside, this means that the U.S. may no longer able automatically rely upon support from Japan and permission to use bases from Japan. At the end of the day, war on the Korean Peninsula would be a "war of choice" for Japan, rather than a "war of necessity".

North Korea's Possible Nuclear Escalation Ladder

U.S. bases in Japan would play critical roles in potential Korean Peninsula contingency planning. U.S. reinforcements from all over the world would go to the Korean Peninsula through U.S. bases in Japan. And they need to pass through Japanese territorial water or airspace. Considering such geo-strategic importance of Japanese physical locations, it is highly natural for North Korea to intimidate Japan so as not to support the U.S., possibly with nuclear blackmail and Japan and the U.S. need to consider this kind of intimidation as a likely scenario. If Japan surrenders to North Korea's blackmail, and if Japan denies support to the U.S. (including

[3] Ministry of Defense, *Defense of Japan of 2017.*

permission to use bases in Japan, or even passage via Japan's territorial water and airspace by U.S. military assets) U.S. forces in Korea would lose support from outside of the Korean Peninsula and North Korea could drastically improve its strategic situation. Considering such huge strategic benefit for North Korea, not just nuclear blackmail, but warning shots including nuclear warning shots, attacks against military facilities to interdict U.S. military operations, or counter-city strikes to increase credibility of their intimidation should be regarded as a legitimate cause for concern.

On the other hand, the U.S. provides commitment for extended deterrence for Japan[4]. If Japan is actually attacked, the U.S. would launch massive counter-strikes against North Korea's strike forces. To deal with such a U.S. reaction, North Korea requires nuclear escalation ladder, not just having a nuclear strike capability against Japan. Nuclear tipped ICBMs would play that role. If North Korea succeeds in the development and deployment of nuclear tipped ICBMs, they can warn the U.S. that if the U.S. launches retaliation for Japan against North Korea's strikes toward Japan, the U.S. would receive re-retaliation by nuclear tipped ICBMs launched from North Korea.

Needless to say, even if North Korea succeeded in deploying nuclear tipped ICBMs, the size of their force would be small. From North Korea's perspective, however, regardless of objective and physical reality, there would be a room to formulate their subjective strategic calculation that they can deter U.S. retaliation, since North Korea's nuclear tipped ICBMs would put the U.S. at risk of nuclear strike.

Needless to say, nobody knows North Korea's intentions nor calculations for their nuclear and missile development program. But these nuclear and missile programs would have the strategic effects discussed above. Japan has made huge efforts to deal with such emerging threats, including enhancing credibility of extended deterrence and building ballistic missile defense capabilities.

JAPAN'S EFFORTS TO UPDATE DEFENSE POSTURE

Against North Korea's nuclear escalation ladder, Japan has made multiple efforts.

[4] Most recent commitment, see President Donald J. Trump and Prime Minister Shinzo Abe, "Joint Statement", February 10, 2017. http://www.mofa.go.jp/files/000227768.pdf

The first one has been to improve its credibility of extended deterrence by the U.S. But this creates two different issues: deterrence against a challenger and assurance for an ally. Among nuclear deterrence specialists, the "Healey Theorem" summarizes the complexity of extended deterrence. In the 1960s, British Defence Minister Denis Healey stated "only five per cent credibility of American retaliation is necessary to deter the Russians, but ninety-five per cent credibility is required to reassure the Europeans"[5].

On the assurance side, the first thing required by the U.S, is a of surge credibility of extended deterrence through demonstration of its high-end capabilities including forward deployment of dual-capable aircraft and strategic bombers to make both regional allies and North Korea believe that the U.S. would certainly conduct retaliation if Japan is attacked. The US has conducted such drills recently. Within the alliance, to increase the credibility of extended deterrence, Japan and the U.S. regularly hold Extended Deterrence Dialogues. Through such continuous dialogue, Japan and the U.S., have deepened shared understandings of nuclear deterrence and continue efforts to develop frameworks to function as extended deterrence as is deemed necessary.

On the deterrence side, there exists a serious challenge. Credibility of extended deterrence basically means credibility of retaliation. However, reliability of retaliation has one logical limitation. Even though Japan holds 100% confidence by assurance efforts, it might not be enough for the security of Japan. By definition, retaliation is launched after the opponent's first strike, and retaliation would not physically prevent a first strike. Thus, even if Japan has 100% confidence that the U.S. would retaliate on behalf of Japan, if North Korea perceives their nuclear escalation ladder would be able to deter U.S retaliation on behalf of Japan, there is a certain degree of possibility that Japan would nonetheless receive a serious attack, even though North Korea's perception is just an overestimation for their nuclear deterrent. The problem is not the Japanese perception of a U.S. reaction, but North Korea's perception and their strategic calculations based on this: as long as they have a certain degree of counter-city nuclear strike capabilities against the U.S. mainland,

[5] Denis Healey, *The Time of My Life*, London: Michael Joseph, 1989, p. 243, quoted in Clark A. Murdock and Jessica M. Yeats, *Exploring the Nuclear Posture Implications of Ext ended Deterrence and Assurance: Workshop Proceedings and Key Takeaways* , November 2009, pp. 2-3. https://csis-prod.s3.amazonaws.com/s3fs-public/legacy_files/files/publicati on/100222_Murdock_NuclearPosture_Print.pdf

the possibility that North Korea embraces a subjective overestimation of the effect of nuclear deterrent against the U.S. cannot be eliminated. Even considering the U.S. homeland BMD systems, even one successful strike can inflict devastation on a target city so North Korea can expect this uncertainty will effectively deter the U.S.

In the context of extended deterrence, such subjective overestimation of North Korea's deterrence poses a serious challenge. If they subjectively overestimate their credibility to deter the U.S., they may launch some kind of strike against Japan including a nuclear warning shot. Even in that case, the U.S. would launch retaliation and fulfill its commitment to extended deterrence. This retaliation strike, however, is a post-event response and cannot save any lives of the Japanese which may have already been lost by North Korea's strike. In this sense, not just a retaliation based extended deterrence, but damage limitation measures including ballistic missile defenses are indispensable.

Japan and the U.S. have already deployed the most advanced and dense theater-based missile defense system in the world. Additionally, in cases of contingency, Japan will be able to expect reinforcements from U.S. deployable missile defense systems.

Since North Korea's Taepo-Dong launch in 1998, Japan has made serious efforts in ballistic missile defenses. In 1998, Japan and the U.S. agreed to launch joint research of AEGIS BMD. And in 2003, Japan decided to deploy a layered BMD system with AEGIS BMD as a sea-based upper-tier defense and PAC-3 as a ground-based lower-tier defense. Since then, Japan has continuously spent about $1 billion every year to develop Japan's BMD systems including radar and command and control systems, in addition to interceptors. And in 2017, Japan decided to deploy AEGIS Ashore as a ground based upper-tier defense system. Regarding its interceptors, the first phase of deployment after 2003 decision, the interceptor for AEGIS BMD was SM-3 Block IA, however, it is to be updated to SM-3.

At the same time, the kinetic interceptor based BMD has inherent limitations. Even if it succeeds in intercepting nearly 100 percent of incoming missiles, if the incoming missile outnumbers kinetic interceptors, the magazine would run out and the defense side can no longer block ballistic missile strikes. Given such a degradation of proficiency of the BMD system by a lengthy campaign of ballistic missile strikes,

the importance of offensive air campaign strikes against ballistic missile launchers before launching the missiles will be increased as time passes. This means a massive U.S. air campaign for pre-launch is essential in lengthy ballistic missile strikes. In this sense, conventional strikes are also important for damage limitation. These can be conventional cruise missiles, air strikes by fixed wing aircrafts, or armed UAVs can also be an option. In addition, the most prompt and surest means, ICBMs, should not be excluded from the options for damage limitation. For the U.S. a strike means using ICBMs to provide the most prompt way to reach the target: the nuclear warheads of ICBMs can inflict serious damage against TEL-like soft targets in a wide range of areas if it is utilized in air-burst mode. In this sense, the nuclear option should be included in such damage limitation measures.

CONCLUSION

Regarding the speculation surrounding North Korea's nuclear and missile developments, in the past, the mainstream view was that these are a diplomatic "bargaining chip" designed to get assurance from the U.S. and Japan for regime survival. Subsequently, the international community tried to achieve diplomatic solutions such as the Framework Agreement or Six Party Talks. These efforts, however, have all been in vain. Considering these failures and North Korea's consistent nuclear and missile development, now the international community need to start to assume that North Korea has no intention of ceasing their program and there is very little hope of reaching an agreement for denuclearization[6]. Based on this assessment, now is the time to consider that their nuclear and missile development projects exist with the objectives of regime survival by minimum deterrence, or even gaining strategic advantage through developing their version of a nuclear escalation ladder.

To cope with Korean Peninsula contingencies, Japan plays a critical role, whilst having virtually no direct military commitment. This unique role of Japan is provided for by its geographical location. North Korea's nuclear escalation ladder has a deep effect of placing Japan at risk and thus improves North Korea's strategic situation. To maintain regional peace and stability, North Korea's strategic

[6] Prepared Statement by Scott Snyder before the United States Senate Committee on Foreign Relations, United States Senate, 1st Session, 115th Congress, "Confronting the North Korean Threat: Reassessing Policy Options", January 31, 2017. http://www.foreign.senate.gov/imo/media/doc/013117_Snyder_Testimony.pdf

weapons' effects must be neutralized. In that context, the importance of efforts to enhance credibility of extended deterrence and improve capabilities of missile defense systems cannot be overestimated. Considering the uncertainty of North Korea's subjective assessments of U.S. extended deterrence, damage limitation would play an essential role. In addition to ballistic missile defenses, allied conventional strikes against ballistic missile related assets are another important element of damage limitation. However, both retaliation-based extended deterrence and missile defenses have limitations. In this context, literally, full-range of capabilities including nuclear options must be a part of U.S. options to physically prevent North Korea from launching nuclear tipped missiles. Recently, nuclear specialists have started to revisit arguments of limited nuclear war[7]. The new geo-strategic landscape in Northeast Asia might not be an exception.

[7] Jeffrey A. Larsen and Kerry M. Kartchner, *On Limited Nuclear War in the 21st Century*, Stanford University Press, 2014.

Chapter 8

Japan-US-ROK Cooperation for Sustaining Deterrence

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South Korea (Republic of Korea; ROK) has reason to believe that it can prevent China's negative influence by restraining US-ROK-Japan security cooperation. In October 2017, South Korea's foreign minister, Kang Kyung-wha, virtually agreed to an assembly member's demand that, to normalize relations with China (People's Republic of China; PRC), the ROK government needed to confirm the following three points: the ROK would not join the US missile defense system, develop the trilateral cooperation into a military alliance, or make an additional deployment of the terminal high altitude area defense (THAAD) system[1]. This is the so-called "three no-policies". On the same day, the PRC Foreign Ministry spokesperson commented, "We hope the ROK will faithfully follow through on its above-mentioned commitments, properly handle the relevant issue, and bring China-ROK relations back [on] to the track of steady and sound development at an early date"[2].

What Kang explained in the above remarks as the existing US-ROK-Japan trilateral security cooperation, as opposed to an "alliance", was the three nations' collaboration to increase "deterrence" and effectively respond to North Korea's nuclear and missile threats[3]. However, South Korea would face China even if the trilateral cooperation focused on managing the North Korean threat, because China's demand for the "three no-policies" itself indicated that the nation increasingly shares the objectives of North Korea's coercive strategy for weakening both of the two US-led alliances in Northeast Asia.

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[1] ROK National Assembly, *Foreign Affairs and Unification Committee Record* (temporary), 2017 Audit Session, October 30, 2017, pp. 6-7.

[2] PRC Foreign Ministry, "Foreign Ministry Spokesperson Hua Chunying's Regular Press Conference", October 30, 2017. http://www.fmprc.gov.cn/mfa_eng/xwfw_665399/s2510_665401/2511_665403/t1505871.shtml.

[3] ROK National Assembly, *Foreign Affairs and Unification Committee Record* (temporary), 2017 Audit Session, October 30, 2017, p. 7.

DESPITE DISPUTES, CHINA SHARES A KEY OBJECTIVE WITH THE DPRK

Security ties depend on sharing the threat to be managed, whether or not there is a dispute. Thus, alignment or an alliance is not the same as friendship. During the 2016–2017 nuclear crisis caused by North Korea, despite disputes with the North, China was sharing a significant number of objectives with the nation in handling issues related to the United States Forces Korea (USFK).

At the first high-level contact with the Trump administration, which was State Councilor Yang Jiechi's telephone conversation with US Secretary of State Rex Tillerson, the Chinese side raised a proposal seeking to achieve the denuclearization of the peninsula in parallel with replacing the armistice with a peace deal[4]. Indeed, almost exactly a year earlier, on February 17, 2016, China's foreign minister, Wang Yi, had expressed the equivalent position––the "dual-track approach"–– for the first time,[5] soon after the US-ROK announcement starting the consultations for deploying the USFK THAAD on February 7, 2016.

Given that the emergence of China's dual-track or parallel-track approach was closely related to the THAAD issue, advocating a peace treaty would reflect the nation's negative awareness of the USFK. Indeed, in a public speech a day after the announcement of South Korea's willingness to accept the THAAD operated by the USFK, Vice Foreign Minister Liu Zhenmin of China insisted that "the relevant bilateral military alliances are a product of a bygone era," mentioning the THAAD deployment as an example of a counterproductive result from making alliances. Following that, Liu said, "parties should support the 'parallel-track' approach of advancing denuclearization of the Korean peninsula and replacing the armistice agreement with a peace treaty"[6]. With respect to the relationship between a peace

[4] Foreign Ministry Spokesperson Geng Shuang's Regular Press Conference on February 22, 2017. https://www.fmprc.gov.cn/mfa_eng/xwfw_665399/s2510_665401/t1440651.shtml

[5] China. Foreign Ministry, "Wang Yi: Shixian Bandao Wuhehua yu Bandao Tinghejizhi Zhuanhuan Bingxing Tuijin [Wang Yi: Moving forward Denuclearization on the Korean Peninsula in parallel with transition from armistice to peace]", February 17, 2016. http://www.mfa.gov.cn/web/wjbzhd/t1341212.shtml

[6] "Actively Practice the Asian Security Concept and Jointly Create a New Future of Asia-Pacific Security: Remarks by Vice Foreign Minister Liu Zhenmin At the Opening Ceremony of the

treaty and the USFK, North Korea has famously insisted that the US-ROK alliance should disappear as a leftover of history after a peace treaty. Even though China may still have a conflict with North Korea, which has occasionally called for a US-DPRK bilateral peace treaty excluding China as a party, "a peace treaty" China advocated in the parallel-track approach has almost the same logic as the North's denial of the legitimacy of the US-ROK alliance.

EXTENDING NORTH KOREA'S COMPELLENCE STRATEGY

One of the objectives the North Koreans promoted against the US-ROK alliance was their version of a peace treaty to replace the armistice agreement. As usual, North Korea also urged people in South Korea to demand the withdrawal of US forces through a peace treaty[7]. The development of nuclear capabilities is allowing North Korea to expand the scope of this compellence strategy beyond the peninsula.

On May 29, North Korea tested a maneuverable reentry vehicle (MaRV)-equipped Scud-based short-range ballistic missile for achieving the capability of "making ultra-precision strikes on the enemies' objects in any area"[8]. This is probably a part of the extended version of diplomatic compellence rather than a Soviet-style counterforce strategy for nuclear war fighting, because North Koreans would never increase survivability in nuclear warfare by destroying enemy strike capabilities. North Korea, a small nation, could not accept even a few nuclear retaliatory attacks and survive. Even if the North's nuclear forces could successfully destroy US forces in Northeast Asia before a reciprocal attack, there is no reason for the nation to expect to survive nuclear war with the United States after that. Thus, counterforce targeting that assumes a nation can take advantage by first destroying the other's military instead of its cities is not suitable for North Korea. Indeed, on the same day as the MaRV test was publicly announced, North Koreans expressed consistent remarks concerning its traditional strategy for compelling the United States and

International Seminar on 'Security Framework and Major-Power Relations In the Asia-Pacific Region'". https://www.fmprc.gov.cn/mfa_eng/wjdt_665385/zyjh_665391/t1379376.shtml

[7] For example, "DPRK-targeted Nuclear War Exercises Flailed in S. Korea", *KCNA*, Mach 10, 2017; "Exhibition for Dialogue and Reunification Opens in S. Korea", *KCNA*, July 29, 2016.

[8] "Kim Jong Un Guides Test-fire of Ballistic Rocket Based on Precision Guidance System", *Rodong*, May 30, 2017.

South Korea to adopt ideas based on concepts like the North Korean version of a peace treaty, which would weaken their alliance.

> Only the U.S. military objects for aggression in Japan have been within the optical sight of the Strategic Force of the Korean People's Army. But if Japan persists in hostility toward the DPRK, following the U.S. and not properly seeing the reality, the target of the DPRK will be changed[9].

Even though MaRV should be used for targeting enemy forces, what this statement stressed was preserving the option of using nuclear missiles on civilians. This is neither the nuclear war-fighting strategy of the Soviet Union nor the counterforce targeting discussed by the US Air Force during the Cold War in rationalizing its first use of nuclear weapons as a decisive blow[10]. Rather than the air force's counterforce targeting, North Korea's notion is closer to Robert McNamara's "counterforce strategy" of not targeting enemy cities with nuclear weapons in order to take them hostage and thereby deter the Soviet Union from doing so. Leaving enemy cities untouched instead of destroying them allows for effectively coercing or deterring the enemy[11].

The threat to US bases in Japan is a precisely extended version of North Korea's traditional military-diplomatic logic to take Seoul hostage for advancing its interests vis-à-vis the US-ROK alliance. The aim of the MaRV test in this case is conveying to Japan that North Korea retains its nuclear option to seriously damage the Japanese population rather than to demonstrate the credibility of destroying US bases in Japan.

What nuclear rather than other weapons can do much more effectively is to pose a direct threat to the enemy population even before destroying the defender's military forces[12]. Even if North Korea were not strong enough to conduct nuclear warfare with the United States, the power to inflict damage is not typically reduced by the

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[9] "Japanese Authorities Warned of Inciting Pressure and Sanctions on DPRK: Foreign Ministry Spokesman", *Rodong Sinmun*, March 30, 2017.
[10] Lawrence Freedman, *The Evolution of Nuclear Strategy*, 3rd ed., New York, Palgrave Macmillan, 2003, pp. 121-123.
[11] Thomas Schelling, *Arms and Influence*, Revised Edition, New Haven, Yale University Press, 2008, pp. 190-192.
[12] Schelling, *Arms and Influence*, p. 22.

adversary's power to retaliate[13]. Much weaker nuclear power could compel a coalition led by the much stronger United States to accept the North's demands. The MaRV test underlined the preservation of direct violence on Japanese civilians by targeting military bases in the populated areas of the country, including Tokyo.

For this strategy to be successfully prevented, the United States, the ROK, and Japan must continuously improve ballistic missile defense (BMD), which could minimize the effects of North Korea's limited military actions regarding coercion. This counter-coercive strategy is conditional on sustaining the credible deterrence of the ROK-US alliance against larger-scale attacks. Otherwise, North Korea would simply expand missile launchings for offsetting BMD[14]. As long as North Korea feels fear about not being able to survive full-scale warfare, the BMD, which raises the hurdle for North Korea to make others worry about their capacity, will reduce the possibilities of the North's coercive strategy. There is no reason for the US-ROK-Japan security cooperation to refrain from developing it.

CHINA'S ECONOMIC DETERRENCE TO THE US-ROK ALLIANCE

Strong economic performance does not necessarily provide a nation with the power to control others until it is operationalized. What is required for operationalizing power as an effective deterrence is drawing a clear red line, showing the enemy what will happen if it crosses the line, and establishing the credibility of the retaliatory action. South Korea's "three no-policies," virtually demanded by China, include clear red lines, and the recent economic pressure from China against the South's first acceptance of the THAAD deployment led to the US ally believing in the credibility of China's retaliation concerning any future crossing of the red lines. Even if the next administration of South Korea intends to abolish the "three no-policies", the government will have to be concerned about the possible economic sacrifices and criticism generated within the nation. The acceptance of the "three no-policies" by the South Korean government allowed China, based on its economic performance, to establish a direct deterrence against the development of the US-ROK alliance.

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[13] *Ibid.*, p. 3.

[14] This effect of BMD supposed that an adversary could launch only limited missile attacks, refraining from full-scale warfare. Brad Roberts, *The Case for U.S. Nuclear Weapons in the 21st Century*, Stanford, Stanford University Press, 2016, pp. 91-92.

Yet Foreign Minister Kang has defined the "three no-policies" as merely confirming the existing policies[15]. In answering questions from China's CCTV about the credibility of the "three no-policies," President Moon Jae-in of South Korea also stated that South Korea's position on the THAAD was not new, but existed currently[16]. However, deterrence specifically means preventing the alteration of an existing position. Their remarks virtually admitted that they were sufficiently deterred by China. Confirming the existing policies of the alliance effectively promises China that they will not cross the red lines, whether or not the term "promise" is used by South Korea.

The three no-policies reflect China's increasingly shared national security objectives with its junior ally, North Korea, because the red lines are clearly consistent with North Korea's interests. As argued earlier, improvements in anti-ballistic missile capabilities are required to offset North Korea's expanding strategy of compellence and to sustain the existing deterrence involving North Korea. The three nations must defend logistics in Japan and the seas surrounding the nation from the increasing missile threats of the North. Credible missile defense requires integrating systems in and beyond the host nations of the US forces, thereby leading to trilateral security cooperation. The economic deterrence of the three no-policies runs counter to these efforts.

In addition, if South Korea continuously follows the three no-policies, the United States and its allies may be forced to negotiate for denuclearizing North Korea without effective incentives in terms of arms control. China only expressed its demands to South Korea to accept the red lines about two months before Kim Jong-un called for talks to settle the two-year-long crisis. China may know the history of the intermediate-range nuclear forces (INF) negotiations: the 1979 double-track decision of the Northern Atlantic Treaty Organization (NATO) backed up the successful US efforts to make the Soviet Union accept the withdrawal of SS-20 missiles, which seriously threatened NATO members in Europe. In the decision, the

[15] ROK National Assembly, *Foreign Affairs and Unification Committee Record* (temporary), 354th Session, No. 6, November 27, 2017, p. 15.

[16] ROK Office of President, "Chunkook CCTV Moon Jae-in Daetongryong Intobyu (China's CCTV interviewed with President Moon Jae-in)", December 12, 2017. https://www1.president.go.kr/articles/1724

NATO nations urged arms control talks to continue and expressed the will to deploy US Pershing II missiles to offset the SS-20 threat if the talks did not sufficiently ease the concerns. The reinforcement of deterrence was the centerpiece of NATO's strategy for letting the Soviet Union accept arms control––the treaty to eliminate INF. With the three no-policies promised by South Korea to abstain from major improvements in deterrence, that is, missile defense, the subsequent denuclearization talks could become a worse version of the INF negotiations for the United States and its allies. Conversely, China's three no-policies have fulfilled an important condition for North Korea to ensure the talks are successful.

CONCLUSION

When the PRC Foreign Ministry demanded the ROK government reconfirm the three no-policies on the day after Kang's statement, China added a further point to be followed by South Korea: "The current THAAD deployment in the ROK will not undermine China's strategic security interests" [17]. This should be a reminder of China's response to the US-ROK maritime exercise planned to warn North Korea after the Cheonan incident in 2010. At that time, China's Foreign Ministry opposed the exercise as undermining the "security interests" of China itself[18]. Even the current THAAD, which focuses on North Korea's missiles, could thus be against what the PRC calls its own "strategic security interests".

For effective denuclearization negotiations and deterrence, the United States, Japan, and South Korea must improve their trilateral security cooperation. It will never be easy to negotiate for denuclearization with North Korea, which has significantly improved its power to coerce others and take advantage of the three no-policies.

[17] PRC Foreign Ministry, "Foreign Ministry Spokesperson Hua Chunying's Regular Press Conference", October 31, 2017. http://www.fmprc.gov.cn/mfa_eng/xwfw_665399/s2510_665401/t1506230.shtml

[18] PRC Foreign Ministry, "Foreign Ministry Spokesperson Qin Gang's Regular Press Conference", July 15, 2010.

CHAPTER 9

European Perspectives on North Korea's Nuclear and Ballistic Missile Programs

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INTRODUCTION

The Korea Central News Agency (KCNA) in late November 2017 declared that North Korea had become a nuclear state. In a statement on the test of the Hwasong-15 missile, KCNA quoted Kim Jong-un as saying that the regime had "finally realized the great historic cause of completing the state nuclear force, the cause of building a rocket power[1]".

According to initial calculations by Michael Elleman of the International Institute for Strategic Studies (IISS), the new missile could indeed deliver a nuclear weapon to any city on the US mainland[2]. In response to the Hwasong-15 test, US president Donald Trump told reporters that Washington would "take care of it[3]".

How, then, are policymakers in the European Union (EU) planning to "take care of" North Korea as a de facto nuclear power? In light of the developments in 2017, this chapter details and analyzes the European discourse regarding Pyongyang's nuclear ambitions.

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[1] KCNA, "DPRK Gov't Statement on Successful Test-fire of New-Type ICBM", November 29, 2017. http://kcna.co.jp/item/2017/201711/news29/20171129-07ee.html

[2] Michael Elleman, "The New Hwasong-15 ICBM: A Significant Improvement That May be Read y as Early as 2018", *38 North*, November 30, 2017. http://www.38north.org/2017/11/mellem an113017/

[3] Reuters, "Trump says North Korea missile launch 'a situation that we will handle'", November 28, 2017. https://www.reuters.com/article/us-northkorea-missiles-trump/trump-says-north-korea-missile-launch-a-situation-that-we-will-handle-idUSKBN1DS2T1

On June 12, 2018, Trump and Kim met in Singapore. It was a historic summit in the sense that it was the first meeting between an incumbent president of the United States and a North Korean leader. At a press conference after Kim's departure later the same day, Trump asserted that Pyongyang had agreed to dismantle its nuclear arms program in a verifiable manner, and that it would proceed "quickly[4]".

During the weeks that followed the Singapore summit, however, there was scant evidence for any steps toward denuclearization. In fact, there were even signs that Pyongyang was further advancing its nuclear program[5]. Despite the summit declaration, in which the two parties agreed to work toward a "denuclearization of the Korean peninsula", North Korea might not have any intention of denuclearizing. Indeed, few North Korea observers in Europe believe that the country will change its strategic calculus by giving up its nuclear weapons, or that it will cave in to international pressure to do so[6].

In response to North Korea's activities, EU member states have issued critical statements — jointly and individually — and implemented UN sanctions. In addition, the EU in 2006 began to adopt autonomous measures complementing and reinforcing the UN Security Council resolutions[7].

Despite all efforts to persuade North Korea to dismantle its nuclear and ballistic missile programs, this endeavor has yet to show tangible results. While the continuously strengthened sanctions regime may have hampered its development of missiles and nuclear devices, North Korea's strategic calculus seems to remain intact.

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[4] Jennifer Williams, "Read the full transcript of Trump's North Korea summit press conference", *Vox*, June 12, 2018. https://www.vox.com/world/2018/6/12/17452624/trump-kim-summit-transcript-press-conference-full-text

[5] David Brunnstrom, "North Korea making bomb fuel despite denuclearization pledge: Pompeo", *Reuters*, July 25, 2018. https://www.reuters.com/article/us-northkorea-usa/north-korea-making-bomb-fuel-despite-denuclearization-pledge-pompeo-idUSKBN1KF2QT; Choe Sang-Hun, "North Korea Starts Dismantling Key Missile Facilities, Report Says", *the New York Times*, July 23, 2018. https://www.nytimes.com/2018/07/23/world/asia/north-korea-dismantling-missile-facilities.html

[6] Étienne Bassoot, "Ten issues to watch in 2018", European Parliamentary Research Service, January 2018, p. 3. http://www.europarl.europa.eu/RegData/etudes/IDAN/2018/614650/EPRS_IDA(2018)614650_EN.pdf

[7] European Council, "EU restrictive measures against North Korea", last updated January 22, 2018. http://www.consilium.europa.eu/en/policies/sanctions/history-north-korea/

NORTH KOREA EMERGES IN THE EUROPEAN DEBATE

At least since its first nuclear test in 2006, Pyongyang's ambitions have been portrayed as one of the major threats to international security. Nevertheless, North Korea has until recently occupied a limited space in the European security debate. The geographic distance to East Asia is but one explanation for the lack of concern. Moreover, the EU has been preoccupied with other crises that have seemed more daunting and imminent[8].

European perspectives on North Korea changed significantly in 2017. This was the year when the Kim Jong-un regime tested more missiles in a single year than ever before and conducted its sixth nuclear test[9]. The United States, for its part, held military exercises with South Korea and continued the launch of the terminal high altitude area defense missile defense system south of Seoul. These and similar moves, regarded by Washington and Pyongyang as equally provocative and unacceptable, prompted aggressive rhetoric and a "war of words" between the two sides.

The anxiety in Europe over miscalculation and a preemptive strike by either the United States or North Korea rose in 2017, not least when President Trump repeatedly emphasized the option of a military solution to contain North Korea[10]. As these developments unfolded, European concerns over military escalation between the United States and North Korea grew[11].

Europe's angst over a security crisis emanating from Pyongyang's unimpeded nuclear ambitions is not likely to go away. Speaking at the UN Security Council in December 2017, Sweden's foreign minister, Margot Wallström, referred to the

[8] Janka Oertel, "Europe's Options on the Sidelines of the North Korea Crisis", *GMF Policy Brief*, August 28, 2017. http://www.gmfus.org/publications/europes-options-sidelines-north-korea-crisis

[9] CSIS, "North Korean Missile Launches & Nuclear Tests: 1984-Present", updated September 20, 2017. https://missilethreat.csis.org/north-korea-missile-launches-1984-present/

[10] Julian Borger, "Merkel offers German role in Iran-style nuclear talks with North Korea", *The Guardian*, September 10, 2017. https://www.theguardian.com/world/2017/sep/10/merkel-backs-iran-style-diplomatic-solution-for-north-korea

[11] Oertel, "Europe's Options on the Sidelines of the North Korea Crisis".

situation on the Korean peninsula as "the greatest threat to international peace and security facing the world today[12]".

In January 2018, the European Parliamentary Research Service (EPRS) identified North Korea as one out of ten issues deemed "likely to occupy a particularly important place on the political agenda of the European Union" this year. In its report, *Ten Issues to Watch in 2018*, the EPRS also listed challenges such as terrorism, disinformation, and Brexit[13]. In the North Korean case, EPRS concluded that there was "no war on the horizon", but that risks remained for a "larger-scale geopolitical conflict[14]".

EUROPE IN NORTH KOREA'S CROSSHAIRS?

The worrisome sequence of events in 2017 furthermore gave rise to concerns that North Korean missiles would eventually threaten European territory directly. North Atlantic Treaty Organization (NATO) member states including France, Britain, and Germany have been vocal in pointing out Europe's vulnerability to Pyongyang's nuclear arsenal.

French defense minister Florence Parly stated that Europe could be within range of North Korean missiles "sooner than expected", with Germany's foreign minister, Sigmar Gabriel, adding that North Korea's nuclear ambitions did not only have regional implications but could also have consequences for Europe[15]. UK defence secretary Gavin Williamson asserted that North Korea had become a "real danger" to Britain: "They are currently on the pathway to have ballistic missiles that could

[12] Government Offices of Sweden, "Statement by Sweden at the Security Council Briefing on No n-Proliferation (DPRK)", December 15, 2017. http://www.government.se/statements/2017/12/ny-sida21/

[13] Étienne Bassoot, "Ten issues to watch in 2018", *European Parliamentary Research Service*, January 2018. http://www.europarl.europa.eu/RegData/etudes/IDAN/2018/614650/EPRS_IDA(2018)614650_EN.pdf

[14] Naja Bentzen, "Europe's challenges in 2018: Ten issues to watch", *European Parliamentary Research Service Blog*, January 17, 2018. https://epthinktank.eu/2018/01/17/europes-challenges-in-2018-ten-issues-to-watch/; Bassoot, .

[15] Reuters, "Europe could soon be within range of North Korean missiles: France", September 5, 2017. https://www.reuters.com/article/us-northkorea-missiles-france/europe-could-soon-be-within-range-of-north-korean-missiles-france-idUSKCN1BG1FZ; Sigmar Gabriel, "Waffen schaffen keine Sicherheit" ["Weapons do not create security"], *Rheinischen Post*, August 16, 2017. http://www.rp-online.de/politik/deutschland/gastbeitrag-von-sigmar-gabriel-waffen-schaffen-keine-sicherheit-aid-1.7015181

strike London[16]". The *Defence and National Security Review 2017*, issued by the French government in October, argued that North Korea could soon have an operational nuclear force of global reach, which could pose a direct threat to Europe[17].

These statements should, of course, be understood in light of North Korea's nuclear *capabilities* and not its *intentions*. Currently, Pyongyang may not have the intention to attack European capitals, but while its intentions can change, the regime will strive to maintain or increase its nuclear capability. That said, the most pressing issue from a European perspective is not the threat of a North Korean nuclear attack on Europe but the risk for nuclear proliferation. This is perceived as an imminent and real threat, and is therefore routinely raised in official European statements on North Korea. The *Defence and National Security Review 2017* specifically raises the possibility of proliferation of North Korean weapons of mass destruction to the Middle East as a threat to Europe[18].

EUROPE'S ROLE IN EAST ASIAN SECURITY

The threat of proliferation is often mentioned by observers as one of the key reasons why Europe should engage in East Asian security. Other relevant European interests include the safeguarding of the international legal order and the preservation of regional peace and stability, not least in order to ensure unimpeded trade with Asia[19]. Europe's stake in East Asian security remains limited in comparison to the interests of the United States. Nevertheless, Europe's continued role as a dialog partner to North Korea is seen as vital for building confidence between North Korea and the international community.

The EU established formal diplomatic relations with North Korea in 2001 (but has yet to establish a presence in the country) and has held a dozen political dialogs with

[16] Kate Ferguson, "North Korea MUST be dealt with before it develops missiles that can strike B ritain, warns the Defence Secretary", *Daily Mail*, December 19, 2017. http://www.dailymail.co. uk/news/article-5194581/Gavin-Williamson-nuclear-North-Korea-confronted.html
[17] Ministère des Armées, *Defence and National Security Review* 2017, October 11, 2017, p. 40. h ttps://www.defense.gouv.fr/english/actualites/articles/strategic-review-a-lucid-and-proactiv e-analysis-to-prepare-for-the-next-military-programming-law
[18] *Defence and National Security Review* 2017, p. 40.
[19] Oertel, "Europe's Options on the Sidelines of the North Korea Crisis".

Pyongyang since[20]. At the time, Sweden was the only Western country with an unbroken diplomatic presence in the country, dating back to the 1970s. Most EU member states have established diplomatic relations with North Korea, of which seven maintain diplomatic missions in Pyongyang[21]. Most notably Sweden, via its embassy, functions as Protective Power for the United States, Australia, and Canada. Sweden and Switzerland also supervise the armistice negotiated in 1953. In addition, the two countries are among the major donors of humanitarian aid to North Korea[22].

North Korean officials have also traveled to Stockholm to hold talks with their Swedish counterparts. In March 2018, the North Korean and Swedish foreign ministers met in the Swedish capital to discuss the security situation on the Korean peninsula[23]. The meeting came just two months after a visit to Stockholm by Han Song-ryol, vice foreign minister, during which the bilateral deliberations focused on Pyongyang's relationship with the United States, Australia, and Canada from the perspective of Sweden's function as Protective Power for the three states[24]. Several meetings between North Korean and US diplomats have reportedly also been held in Norway[25].

[20] *Ibid*.
[21] Bulgaria, the Czech Republic, Germany, Poland, Romania, Sweden, and the United Kingdom have embassies in Pyongyang.
[22] Financial Tracking Service, "Democratic People's Republic of Korea". https://fts.unocha.org/countries/118/summary/2017
[23] Reuters, "Sweden, North Korea talks end, may help pave way for Trump-Kim encounter", March 17, 2018. https://www.reuters.com/article/us-northkorea-missiles-sweden/sweden-north-korea-talks-end-may-help-pave-way-for-trump-kim-encounter-idUSKCN1GT0M5
[24] Malin Hansson, "Nordkoreas vice utrikesminister på uppdrag — i Sverige", [North Korea's Vice Foreign Minister on a mission — in Sweden], *Expressen*, January 29, 2018. https://www.expressen.se/nyheter/nordkoreas-vice-utrikesminister-pa-uppdrag-i-sverige/; Xinhua, "DPRK Foreign Ministry delegation leaves for Sweden", January 27, 2018. http://www.xinhuanet.com/english/2018-01/27/c_136929490.htm
[25] NTB, "Norge i uvant rolle i Nord-Korea-samtaler [Norway assumes rare role in North Korea talks]", May 9, 2017. https://www.abcnyheter.no/nyheter/verden/2017/05/09/195301430/norge-i-uvant-rolle-i-nord-korea-samtaler; NRK, "Japansk presse: Planer om Nord-Korea-samtaler i Oslo i oktober [Japanese media: Plans for North Korea talks in Oslo in October]", September 29, 2017. https://www.nrk.no/urix/japansk-presse_-planer-om-nord-korea-samtaler-i-oslo-i-oktober-1.13710533

EUROPE AND NORTH KOREA: CRITICAL ENGAGEMENT

As early as 2003, the European Council listed North Korea's nuclear activities as one of the key areas of concern in its *European Security Strategy*. It also stated that proliferation of weapons of mass destruction (WMD) was "potentially the greatest threat to our security[26]".

In its policy of "critical engagement" toward North Korea, the EU emphasizes three key areas of engagement: 1) contributing to a sustainable reduction of tensions on the Korean peninsula and in the region; 2) upholding the international nonproliferation regime; and 3) improving the situation of human rights in the country[27].

The European Council describes the policy of critical engagement as "a means to promote the DPRK's full compliance with UNSC Resolutions in terms of abandoning its nuclear, WMD and ballistic missile programs in a complete, verifiable and irreversible manner[28]".

The EU, however, largely remains a bystander on the North Korea issue and has no apparent leverage vis-à-vis Pyongyang[29]. In order to be able to pursue its policy of "critical engagement" more effectively, it has been suggested that the EU could follow through with its plans to open a delegation office in Pyongyang[30].

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[26] EEAS Strategic Planning, "European Security Strategy — A Secure Europe in a Better World", pp. 4, 7. https://europa.eu/globalstrategy/en/european-security-strategy-secure-europe-better-world

[27] European Union External Action Service, "DPRK and the EU", June 26, 2016. https://eeas.europa.eu/headquarters/headquarters-homepage/4186/dprk-and-eu_en

[28] European Council, "Council Conclusions on the Democratic People's Republic of Korea", July 17, 2017. http://www.consilium.europa.eu/en/press/press-releases/2017/07/17/conclusions-korea/

[29] Mark Fitzpatrick, "North Korean proliferation challenges: the role of the European Union", *Stockholm International Peace Research Institute*, June, 2012. https://www.sipri.org/publications/2012/eu-non-proliferation-papers/north-korean-proliferation-challenges-role-european-union; Lina Grip, "The European Union and Non-Proliferation", *Stockholm International Peace Research Institute*, August 2017. https://www.sipri.org/sites/default/files/2017-09/eunpc_final_report_2017_0.pdf

[30] Fitzpatrick, "North Korean proliferation challenges: the role of the European Union".

THE MILITARY OPTION IS NO OPTION

The European Council is "strongly convinced" that denuclearization of the Korean peninsula "must be achieved through peaceful mean[31]". From the European perspective, a military solution to the North Korean crisis is not an option. In response to repeated statements from the Trump administration on the option of conducting preemptive strikes on North Korea, Federica Mogherini, High Representative of the European Union for Foreign Affairs and Security Policy, emphasized the EU's opposition against any military action toward North Korea. Mogherini stated that the EU "will always look for a diplomatic solution, because we know that thinking, even thinking of a military solution to this kind of tensions, not only is dangerous but also it does not solve the problem at all[32]".

If the United States were to attack North Korea, the consequences of even a conventional counterattack could involve millions of deaths, including in South Korea, a strategic partner to the EU[33]. Malcolm Chalmers of the Royal United Services Institute (RUSI) describes this option as "the near certainty of catastrophe if the United States were to launch a new Korean War without the agreement of those it is committed to protect[34]".
Hence, the EU regards dialog with North Korea as the most effective means to resolve tensions and to safeguard peace and stability on the Korean peninsula. German foreign minister Sigmar Gabriel has even stated that there is no other way to deal with North Korea than by means of negotiation[35].

[31] European Council, "Council Conclusions on the Democratic People's Republic of Korea".
[32] European Union External Action Service, "Speech by HR/VP Mogherini at the opening session of the 2017 EU Ambassadors conference", June 26, 2016. https://eeas.europa.eu/headquarters/headQuarters-homepage/31424/speech-hrvp-mogherini-opening-session-2017-eu-ambassadors-conference_en
[33] Tom Plant, "Uniting US and European approaches to North Korea", *East Asia Forum*, November 1, 2017. http://www.eastasiaforum.org/2017/11/01/uniting-us-and-european-approaches-to-north-korea/
[34] Judy Dempsey, "Judy Asks: Is It Time for Hard Power in North Korea?", *Carnegie Europe*, September 06, 2017. http://carnegieeurope.eu/strategiceurope/73013
[35] Gabriel, "Waffen schaffen keine Sicherheit".

DIALOG AND PRESSURE

Lacking direct leverage over Pyongyang, Brussels and individual EU member states could contribute in terms of mediation and confidence-building measures[36]. In particular, it has been suggested that the EU could draw from its experiences from negotiations with Iran, which resulted in the 2015 nuclear agreement.

According to Mogherini, the EU is willing to mediate in any talks aimed at freezing North Korea's missile and nuclear weapons programs[37]. Sweden's prime minister, Stefan Löfven, as well as Foreign Minister Margot Wallström have also offered their assistance in any negotiations with North Korea[38]. Moreover, German chancellor Angela Merkel offered German participation in any future nuclear talks with North Korea. Merkel suggested that the 2015 agreement with Iran could serve as a model for negotiations[39]. In addition to promoting its own role in any future talks with North Korea, Brussels has also voiced its support for South Korean initiatives to revive communications with the Kim Jong-un regime and to build confidence among the parties[40].

The critical engagement policy of the EU is, however, not only about dialog but also involves exerting pressure on the regime in Pyongyang as a means to support nonproliferation and denuclearization efforts[41]. In addition to multiple EU sanctions on North Korea adopted since 2006, scholars have suggested that the EU could attempt to persuade China and Russia to strike against the North Korean

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[36] Dempsey, "Judy Asks: Is It Time for Hard Power in North Korea?".
[37] Reuters, "North Korea seen seeking direct U.S. talks as EU diplomatic back channel with Pyongyang goes cold", October 4, 2017. https://www.japantimes.co.jp/news/2017/10/04/asia-pacific/politics-diplomacy-asia-pacific/north-korea-seen-seeking-direct-u-s-talks-eu-diplomatic-back-channel-pyongyang-goes-cold/#.WnYWIGbpKRs
[38] TT, "Löfven erbjöd Trump hjälp med Nordkorea" [Löfven offered Trump assistance on North Korea], 20 September, 2017. http://www.unt.se/nyheter/omvarld/lofven-erbjod-trump-hjalp-med-nordkorea-4762504.aspx; Robin Emmott and Gabriela Baczynska, "EU defends Iran deal despite Trump, appeals to U.S. Congress", *Reuters*, October 16, 2017. https://in.reuters.com/article/iran-nuclear-eu/eu-defends-iran-deal-despite-trump-appeals-to-u-s-congress-idINKBN1CL161?feedType=RSS&feedName=worldNews
[39] Borger, "Merkel offers German role in Iran-style nuclear talks with North Korea".
[40] Emanuele Scimia, "Will EU be part of new Six-Party Talks on N Korea?", *Asia Times*, July 23, 2017. http://www.atimes.com/will-eu-part-new-six-party-talks-north-korea/
[41] Deutsche Welle, "Sigmar Gabriel calls for 'pressure and dialogue' to deal with North Korea", September 18, 2017. http://www.dw.com/en/sigmar-gabriel-calls-for-pressure-and-dialogue-to-deal-with-north-korea/a-40551777

economy by the means of oil sanctions[42]. Moreover, the EU could increase the pressure on the regime by adopting sanctions in concert with the United States on banks and financial institutions that are engaged in foreign exchange activities related to Pyongyang's nuclear and missile programs[43]. Yet secondary sanctions would mainly be directed at China, the EU's second-largest trade partner. Considering the negative consequences for the relationship with China, the prospects for such sanctions remain unlikely[44].

IS NORTH KOREA A NUCLEAR POWER?

In light of the perceived failure of sanctions on North Korea, many in Europe already regard North Korean denuclearization as a "lost cause[45]". It has become apparent that the regime does not intend to stop short of recognition as a de facto nuclear power, giving it the same status as India, Pakistan, and Israel, which are all outside the Non-Proliferation Treaty (NPT)[46]. Few European observers expect Pyongyang to change its strategic calculus[47].

In Russia's view, regional stability can be achieved by tacit acknowledgment of North Korea as a de facto nuclear power[48]. In the long run, China too might be more willing to accept a North Korean nuclear arsenal than a continued American military presence near its territory. Despite the fact that such recognition would be inconsistent with the NPT, Pyongyang may have been convinced by the cases of India, Pakistan, and Israel that a tacit acknowledgment by the international community could be achievable[49].

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[42] Dempsey, "Judy Asks: Is It Time for Hard Power in North Korea?".
[43] Mason Richey, "EU-South Korea Security Relations: The Current State of Play", *Egmont Royal Institute for International Relations Security Policy Brief*, May 2017. http://www.egmontinstitute.be/content/uploads/2017/05/SPB87.pdf?type=pdf
[44] *Ibid.*
[45] Mathieu Duchâtel, "Nuclear North Korea: Perpetuating the fiction" *European Council on Foreign Relations*, August 31, 2017. http://www.ecfr.eu/article/commentary_nuclear_north_korea_perpetuating_the_fiction_7227
[46] Bassoot, "Ten issues to watch in 2018".
[47] Bentzen, "Europe's challenges in 2018: Ten issues to watch".
[48] Kathrin Hille, Bryan Harris and Demetri Sevastopulo, "Putin says sanctions drive against North Korea is pointless", September 6, 2017. https://www.ft.com/content/b4d37d7e-91d8-11e7-a9e6-11d2f0ebb7f0
[49] Enrico D'Ambrogio, "North Korea: Possible scenarios", *European Parliamentary Research Service*, September 2018, p. 4. http://www.europarl.europa.eu/RegData/etudes/BRIE/2017/608681/EPRS_BRI(2017)608681_EN.pdf

A vital difference between the three de facto nuclear-armed states and North Korea is their declared opponents. Pyongyang has explicitly stated that its development of nuclear weapons is motivated by a need for deterrence against one specific actor: the United States. It has also asserted that it could consider launching a preemptive nuclear attack on the United States, that is, moving beyond a second-strike doctrine[50]. Israel, India, and Pakistan have, of course, made no such threats vis-à-vis the United States.

The EU has been clear in its message that it will not acknowledge, let alone accept, a North Korea with nuclear arms. Some European observers have suggested that such an acknowledgment could produce positive results, namely that Pyongyang may be persuaded to agree to a moratorium on nuclear and missile tests. A much more likely scenario, however, is that there will be no such recognition, and that North Korean nuclear and missile tests will continue[51].

EU Concerns over Nuclear Proliferation

North Korea declared in late November 2017 that it had become a nuclear state[52]. It should be noted that its ability to attack the US mainland, or any other target, with a nuclear weapon remains in doubt. Nevertheless, the United States and its allies have already begun to revise their defensive and offensive assets, partly in response to the threat from Pyongyang.

The consequences of a nuclear-armed North Korea is one of the contentious issues in the European debate on Pyongyang's nuclear ambitions. France's 2017 *Security Review* states that the breaking of the status quo on the Korean peninsula could lead to the invoking of the clauses of mutual assistance between the United States and its allies, but also to Japan and South Korea reconsidering their military postures[53].

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[50] Reuters, "North Korea says pre-emptive attack on America is 'imminent' as US bombers conduct show of force", September 24, 2017. http://www.scmp.com/news/asia/east-asia/article/2112571/north-korea-pre-emptive-attack-america-imminent-us-bombers

[51] Bentzen, "Europe's challenges in 2018: Ten issues to watch".; Bassoot, "Ten issues to watch in 2018".

[52] KCNA, "Kim Jong Un Guides Test-fire of ICBM Hwasong-15", November 29, 2017. http://dprk-doc.com/en/archives/1753

[53] *Defence and National Security Review* 2017.

Faced with North Korea's nuclear capabilities, neighboring countries could come to see no other option than to develop their own WMD programs, it said[54].
Malcolm Chalmers of RUSI concludes that with North Korea as "a nuclear, ICBM-armed state", the United States and its Asian allies will need to make significant investments in the strengthening of nuclear defense and deterrent capabilities[55]. Another observer states that North Korea's activities could convince regional actors that they have to "adopt the nuclear option[56]. Yet another scholar sees Northeast Asian escalation and further instability as a potential result of Japan, South Korea, and other regional powers acquiring nuclear capabilities[57].

Meanwhile, NATO members France and Britain have rhetorically linked their own nuclear deterrence to that of North Korea. The French *Security Review* states that it is essential for France to maintain its nuclear deterrence as "some" powers use their nuclear forces for "power demonstration, intimidation, or even blackmailing purpose[58]". The UK *Security Review* of 2015 also lists proliferation of nuclear weapons and North Korea's pursuit of nuclear weapons and ballistic missiles as a serious concern[59]. (In contrast, Germany's 2016 *White Paper on Security Policy and the Future of the Bundeswehr* does not mention North Korea[60]).

Faced with these consequences of North Korea's nuclear deterrence, China and Russia may become increasingly active in their attempts to affect strategic decision-making in Washington but also in allied states and within NATO. One such recent example is China's covert one-year boycott of South Korea, which was aimed at putting an end to its cooperation with the United States on missile defense.

So far, China and Russia have promoted the concept of "double suspension" as a means to lower tensions between North Korea and the United States. According to this concept, which was originally suggested by Pyongyang, the United States and South Korea should suspend joint military exercises in exchange for a North Korean suspension on missile and nuclear tests.

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[54] *Defence and National Security Review* 2017, p. 41.
[55] Dempsey, "Judy Asks: Is It Time for Hard Power in North Korea?".
[56] Bassoot, "Ten issues to watch in 2018".
[57] D'Ambrogio, "North Korea: Possible scenarios".
[58] *Defence and National Security Review* 2017, p. 70.
[59] UK Government, "National Security Strategy and Strategic Defence and Security Review", pp. 19 and 34.
[60] *White Paper on Security Policy and the Future of the Bundeswehr.*

If put into effect, the Sino-Russian proposal could indeed contribute to the promotion of a key EU interest in the region, namely the reduction of tensions. That said, the concept of "double suspension" does not involve the issue of denuclearization, nor does it clearly rule out that North Korea is accepted as a nuclear state. The concept rather suggests a weakening of American military engagement in East Asia, which is a core strategic interest of both Moscow and Beijing. The EU does not yet have a position on "double suspension[61]". Brussels should, however, not be expected to support the concept if it leads to undermining the US strategic role in East Asia.

A resolution of the North Korean nuclear issue is currently not in the cards. We are likely to witness a period of buildup of defensive and offensive capabilities both in East Asia and elsewhere, motivated by North Korea's threats. This is a chain reaction that may well stretch into Europe.

[61] Duchâtel, "Nuclear North Korea: Perpetuating the fiction".

SEMINAR PROGRAM

The 2nd NDA-FOI Joint Seminar
North Korea's Security Threats Reexamined

February 7th, 2018

At the Conference Room No.2 at the Head Quarter Building of National Defense Academy, 1‐10‐20 Hashirimizu, Yokosukashi, Kanagawa 239-8686 JAPAN

10:20 Opening Remarks

Yasuhiro Takeda (Director and Professor, Center for Global Security, National Defense Academy NDA)

10:30-12:00 Session I: North Korea's Nuclear Posture and Technological Development

Hideya Kurata (Professor, NDA)

North Korea's Nuclear Deterrence Posture

Anders Lennartsson (Deputy Research Director, Swedish Defence Research Agency: FOI)

North Korea's WMD Development: Technological Aspects

Sangmin Lee (Active-Duty Researcher, Korea Institute for Defense Analyses: KIDA)

North Korea's WMD Development: Technological Aspects

12:00 Lunch Speech

Ryosei Kokubun (President of NDA)

13:30-15:00 Session II: Developments and Prospects of US-DPRK-ROK Standoff

Jonathan Miller (Senior Visiting Fellow, Japan Institute of International Affairs: JIIA)

US Position

Hiroyasu Akutsu (Senior Fellow, National Institute of Defense Studies: NIDS)

DPRK Position

Kyengho Son (Professor, Korea National Defense University: KNDU)

ROK Position

15:30-18:00 Session III: Japan and Sweden in North Korea's Nuclear Challenge

Sugio Takahashi (Chief and Fellow, NIDS)

Japan's Defense Policies

Takeshi Watanabe (Senior Fellow, NIDS)

Japan-US-ROK Relations

Jerker Hellström (Project Leader, FOI)

European Perspective

18:00 Closing Remarks Jerker Hellström (FOI)

*Each of presenter is requested to make presentation within 15-20 min

*No discussant is designated

Dr. Hiroyasu Akutsu　阿久津　博康

Dr. AKUTSU Hiroyasu is a Senior Fellow and Professor at the Policy Simulation Division at the National Institute for Defense Studies (NIDS). He specializes in political and military affairs on and around the Korean Peninsula and also works on security issues in the Asia-Pacific with focus on Japan-US-ROK security cooperation, Japan-Australia security cooperation, and the Japan-US alliance. His studies also include scenario planning, policy simulation/strategic gaming and operations research (OR). Before joining NIDS in 2008, he had been a director of research at a Tokyo-based research institution and lecturer at several universities in Canberra and Tokyo. After joining NIDS, he was also a visiting fellow at the Royal United Services Institute (RUSI) in London (2010-2011) and a Japan Chair visiting scholar at the Center for Strategic and International Studies (CSIS) in Washington D.C. (2014). He received his Bachelor of Law and LL.M. from Keio University and his Ph.D. in political science and international relations from the Australian National University (ANU).

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Chief of Staff, 5th Brigade, Northern Army
Director, General Affairs Department, Eastern Army

Commander

Commander, 340th Engineering Company, Northern Army
Commander, 4th Engineering Group, Eastern Army
Commander, Engineering Depot, Eastern Army
Commander, Middle Army Combined Brigade, Middle Army

Foreign Affairs

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Most of his research-related work is on projects for the Swedish Ministry of Defence. Mr Hellström previously held a position as Deputy Director at the Office for Strategic Analysis of Sweden's Ministry for Foreign Affairs, where he conducted China-related research.

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Hideya Kurata is a Professor at Department of International Relations and the Graduate School of Security Studies, National Defense Academy (NDA). Before joining the NDA, he worked at Tokoha-Gakuen Fuji Junior College (1990-2001) and Kyorin University (2001-2008). His majors are International Security, Korean Politics and Foreign Policies. His publications include "A Conceptual Analysis of the Six-Party Talks: Building Peace through Security Assurances" *Asian Security*, Vol.3, No.1 (2007, in English), *The US-China Relations: the Structures and the Evolutions,* Nihon Kokusai Mondai Kenkyuusyo (JIIA) (co-authored, 2007, in Japanese), "Six-Party Talks and the Establishment of the Peace System at the Korean Peninsula," *North Korean Studies (Dongguk University, The Institute for North Korean Studies)*, Vol. 1(2005), (in Korean). He also co-edited, *Korean Peninsula and International Politics*, Keio University Press, 2005 (in Japanese). He learned at Graduate School of Keio University in Tokyo and Yonsei University in Seoul and finished the Doctoral program at Keio University.

Dr. Sangmin Lee

Lee, Sang Min(November 8, 1974) is an Active-duty researcher at the Korea Institute for Defense Analyses(KIDA) in Seoul, Korea. Dr. Lee received his Ph.D. in Material science and engineering from Tohoku University, Japan. He was an expert from the Ministry of National Defense at the South Korean Foreign Ministry. His main research focuses on North Korea's Weapons of Mass Destruction. Dr. Lee recently published numerous articles and reports including *Kim Jong Un's Gains and Losses from the Second Launch of Hwasong-14(2017); The Technological Assessment of the Fourth North Korean Nuclear Test and the Prospect of Future Tests(2017).*

Dr. Anders Lennartsson

Dr Anders Lennartsson is a Deputy Research Director at the Swedish Defence Research Agency, FOI, where he has been working since 1999. His main areas of work are missile related questions, including cruise missiles, air to air missiles, ballistic missiles and missile defence. Areas of interest include dynamics and control, in particular of missiles and aircraft, and navigation.

Most of his research related work is on projects for the Swedish Armed Forces, but for more than a decade he has been covering missile and missile defence related questions for the Swedish Ministry for Foreign Affairs, who need such expertise in several multilateral fora. Part of these duties include work within the Missile Technology Control Regime. Between 2011 and 2017 he was the Chair of the Technical Experts Meeting, the working group where the MTCR Technical Annex is maintained and updated based on technical developments in the area of missile technology. He has also been involved with EU working groups in the area of export control and sanctions. International contacts is a main theme in Lennartsson's work, and in parallel with research tasks he has been an international coordinator at FOI responsible for bilateral contacts with defence research organizations in Canada, the Netherlands and the United Kingdom.

Lennartsson has also been deputy head and acting head of the department of Systems Technology, who work mainly with modelling and analysis of weapon systems. He is currently a project leader for a large research project covering military aircraft technology.

Lennartsson received a Master of Science in aerospace engineering from the Royal Institute of Technology, KTH, in 1991 and a PhD in theoretical and applied mechanics, focusing on dynamical systems, also from KTH, in 1999.

Mr. Jonathan Miller

Jonathan is an international affairs professional with expertise on security, defense and intelligence issues in Northeast Asia. He has held a variety of positions in the private and public sector. Currently, he is a senior visiting fellow with the Japan Institute of International Affairs (JIIA) based in Tokyo, Japan. He is also a Distinguished Fellow with the Asia-Pacific Foundation of Canada. Additionally, he is the Director and co-founder of the Ottawa-based Council on International Policy. Miller is also a Senior Fellow on East Asia for the Asian Forum Japan, based in Tokyo.

Previously, he was an international affairs fellow with the Council on Foreign Relations, based in Tokyo. Jonathan also held a senior fellowship (2014-2017) with the East West Institute and a fellowship on Japan with the Pacific Forum CSIS from 2013-16. At the Pacific Forum CSIS, he chaired a ten-member group focused on Japan-Korea relations, in the context of the US "rebalance" to Asia. Miller has also held a number of other visiting fellowships on Asian security matters, including at JIIA and the National Institute of Defense Studies (Ministry of Defense - Japan).

In addition, Miller previously spent nearly a decade working on economic and security issues related to Asia with the Canadian federal government and worked both with the foreign ministry and the security community. He regularly attends track 1.5 and track 2 dialogues in the region and lectures to universities, corporations and others across the Asia-Pacific region on security and defense issues. He also regularly provides advice and presents to multilateral organizations and foreign governments on regional geopolitics.

Jonathan is a regular contributor to several journals, magazines and newspapers on Asia-Pacific security issues including *The Economist Intelligence Unit, Foreign Affairs, Forbes* and *Newsweek Japan.* He has also published widely in other outlets including *Foreign Policy, the World Affairs Journal, the Nikkei Asian Review, the Japan Times, the Mainichi Shimbun, the ASAN Forum, Jane's Intelligence Review* and *Global Asia*. Miller has been interviewed and quoted on regional security issues across a wide range of media including *the New York Times, the Washington Post, Reuters, CNN, CNBC, the*

Wall Street Journal, Le Monde, the Japan Times, Asahi Shimbun, the Voice of America and *ABC news.*

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- 2012.2 - 2013.2: Director of Center for Terrorism and International Conflicts of RINSA
- 2013.3 - 2014.1: Director of Center for North Korean Affairs of RINSA
- 2015.1 - 2015.12: Visiting Scholar: Mershon Center, The Ohio State University
- 2016.1 - 2017.5: Chief Secretary of KNDU
- 2018.1 – 2018.12: Director of Center for Military Strategy of RINSA
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- "The Establishment and the Role of the State-Joint Chiefs of Staff Meeting during the Korean War," *War in History*, December 2018, https://doi.org/10.1177/0968344518782712.
- *Dongbuga Gukaduri 6.25jeongjaengjeongchekgwa Jeonryak* [The Policies and Strategies of Northeast Asian Countries in the Korean War], Seoul: Jimundang, 2015.

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Selected Publications

English

- "The Japanese Perception of the Information Technology- Revolution in Military Affairs: Toward a Defensive Information-Based Transformation," in Emily O. Goldman and Thomas G. Mahnken., eds., The Information Revolution in Military Affairs in Asia (NY: Palgrave Macmillan, 2004).

Japanese

- "RMA to Nihon no Bouei Seisaku [The Impact of Revolution in Military Affairs on Japan's Defense Policy]," in Tomoyuki Ishizu ed., Sensou no Honshitsu to Gunjiryoku no Shosou [The Nature of Warfare and Forms of Military Power], (Tokyo: Sairyusha, 2004)
- "America no Misairu Bouei to Post-MAD Jidai no Kokusai Anzen Hoshou [American Missile Defense and International Security in the Post-MAD Era]," Kokusai Anzen Hoshou [The Journal of International Security], Vol.29, No.4 (March 2002).
- "Jouhou RMA to Bush Seiken no Kokubou Henkaku Kousou [Information-based RMA and Defense Transformation of Bush Administration]," in Shigekatsu Kondo and Tetsuya Umemoto, eds., Bush Seiken no Kokubou Seisaku [The Defense Policy of the Bush Administration], (Tokyo: Japan Institute for International Affairs, 2002).

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