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**Research Report**

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SWP Comments, No. 32/2017

**Provided in Cooperation with:**

Stiftung Wissenschaft und Politik (SWP), German Institute for International and Security Affairs, Berlin

*Suggested Citation:* Paul, Michael; Suh, Elisabeth (2017) : North Korea's nuclear-armed missiles: Options for the US and its allies in the Asia-Pacific, SWP Comments, No. 32/2017, Stiftung Wissenschaft und Politik (SWP), Berlin

This Version is available at:

<https://hdl.handle.net/10419/256464>

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# North Korea's Nuclear-Armed Missiles

Options for the US and its Allies in the Asia-Pacific

Michael Paul/Elisabeth Suh

During his presidential campaign, Donald Trump unsettled the governments of Japan and South Korea by suggesting they should develop their own nuclear weapons to defend against the missile threat from North Korea. When Pyongyang announced the launch of four missiles towards the island of Guam, a US territory in the West Pacific, President Trump demanded North Korea stop issuing threats against the US or “they will be met with fire and fury”. Instead of bellicose rhetoric, however, diplomacy is needed to bring about de-escalation and dialogue with North Korean leader Kim Jong-un. Pyongyang has made significant advancements in its nuclear and missile weapons programmes. Washington is now faced with the quandary of how to react to the growing threat both to its allies and to its own territory. None of the policy options available to the US and its allies in the Asia-Pacific region seem promising and can, at best, only be successful in the long term.

Kim Jong-un has adopted a dual strategy that combines the pursuit of nuclear weapons with economic progress. The regime's self-confidence has grown in recent years, mainly due to North Korea's advancements towards nuclear-armed status which it regards as essential to national prestige and its legitimacy. In addition, the city of Pyongyang is experiencing a modest, but evident economic boom.

The regime's primary goal is to preserve and protect the Kim dynasty. For Pyongyang, the fates of Saddam Hussein and Muammar Gaddafi serve as proof that the only guarantee for his own and his regime's survival is its nuclear weapons programme. Furthermore, nuclear weapons could be

seen in Pyongyang to serve as a leveraging tool to possibly even demand the withdrawal of US troops and achieve unification with South Korea according to the Kim regime's terms. In this sense, nuclear-capable long-range missiles could result in driving a wedge between the allies and ultimately decouple the US from its alliance obligations in the Asia-Pacific region.

Due to its alliance policy and its status as a Pacific power, the US, alongside China, is the most important actor in East Asia. Also, from a historical perspective, the US signed the ceasefire agreement with China and North Korea in 1953 in order to end the fighting in Korea. The key to finally ending the Korean War and solving the North

Korean crisis lies, therefore, in Washington. Nevertheless, the US government has only limited options at its disposal to prevent North Korea from further advancing its nuclear-capable missiles, or to even force their complete disarmament. All of these options are neither good nor very promising and all of them require consistent support, particularly from Beijing and Seoul.

### **The Current Status of Weapons Developments in North Korea**

Until recently, the regime in Pyongyang was regarded as a paper tiger and its ability to build nuclear-armed intercontinental missiles was thought to be very unlikely or could happen only in a distant future. However, the regime has made significant progress with regard to nuclear weapons and carrier systems in recent years.

North Korea conducted its first nuclear weapons test on 8 October 2006, and its second on 25 May 2009. Since Kim Jong-un came to power in November 2011, there have been three more tests. The most recent and biggest test took place on 9 September 2016 – with an explosive force of ten kilotons (the atomic bombs used on Hiroshima and Nagasaki in 1945 were between ten and 20 Kt). It was allegedly the test of a miniaturized nuclear warhead that can be mounted onto a missile. The regime is said to already possess more than a dozen nuclear explosive devices and have further weapons grade material at its disposal. In a worst-case scenario, Pyongyang might have more than 100 nuclear weapons by 2020. According to such an assessment, the former paper tiger has become a real threat – which also comes from its growing experience in missile technology.

In 2016, North Korea conducted 24 missile tests, the highest number ever recorded in one year. These tests reveal the diversity of Pyongyang's launch sites spread across the country and the variety of missile and carrier systems, including intermediate-range missiles with a range of between 3,000 and 5,000 kilometres (Intermediate-

Range Ballistic Missile, IRBM). The Kim regime has also tested the simultaneous launch of several ballistic missiles, missile launches with steep trajectories and missile launches from a platform at sea (Sea-Launched Ballistic Missile, SLBM). These variations could make it more difficult for the THAAD defence system, which is deployed in South Korea, to intercept North Korean missiles. In the long term, the development of indigenous SLBMs is the most dangerous and technically most difficult undertaking. China might become concerned about these developments since the leadership in Beijing attaches great importance to its own second-strike nuclear capability, which is largely achieved with SLBMs. North Korea is now attempting to station its Pukguksong-1 missiles on submarines. The regime is even said to be developing new submarines for this purpose.

Furthermore, Pyongyang is working on missiles with a range of more than 5,500 kilometres (Intercontinental Ballistic Missile, ICBM) that can be launched from fixed or mobile sites on land. The launch of a North Korean satellite in 2012 probably served to develop a nuclear-armed ICBM because space launch vehicles have characteristics similar to those required to lift payload onto intercontinental missiles. Further tests followed to evaluate various components, such as solid and liquid fuel, mobile launch units and flight engines.

Missile tests conducted in May 2017 confirm that further progress was rapidly being made. On 14 May, North Korea tested a medium-range missile (Hwasong-12) with a range of more than 4,000 kilometres, as US experts calculated. A few days later, North Korean media announced that the government had tested a missile propulsion stage, which observers believed to be the element of a new ICBM. Another medium-range missile with a range of 1,000 to 3,000 kilometres (Medium-Range Ballistic Missile, MRBM) was launched on 21 May from a mobile transporter. This solid-fuelled missile (Pukguksong-2) is said to have gone into serial production.

Solid-fuel rockets can be deployed on mobile units, allowing for quick operability and greater survivability. The benefit of solid-fuel engines is that the fuel is extremely stable, thus the missile can be easily stored and the weapon is ready to be fired virtually immediately. As a mobile system the missile is more difficult to detect and neutralize before it is launched. Further tests are likely to show whether or not they are also reliable.

Even though Pyongyang's prototype missiles often appear to be deficient, it would be irresponsible to ignore these developments. South Korea and Japan are already within range of North Korea's short and medium-range missiles. In theory, these missiles can already be equipped with weapons of mass destruction – nuclear, biological or chemical.

### **Strategic Patience à la Trump**

After reviewing its options, in April 2017, the Trump Administration announced it would adopt a policy of “maximum pressure and engagement” in order to force North Korea to end its weapons programmes. The new US government does not yet have a comprehensive China or East Asia strategy, however, and there are still open questions regarding its policies towards Pyongyang. As with previous administrations, Washington's ultimate goal is the complete, verifiable and irreversible denuclearization of North Korea. Moreover, the Trump government insists that China fully and consistently implement the sanctions imposed on Pyongyang. Otherwise, the US is prepared to move forward only with its allies, South Korea and Japan.

To a great extent, Washington's current policy resembles the approach of strategic patience, which was previously adopted by the Obama administration. Both approaches are based on the assumption that North Korea will return to the negotiating table and commit to denuclearization if enough political and economic pressure is applied. This approach as well as the assumption

that the regime will soon collapse both appear to be unlikely. On the contrary, Pyongyang has become even more self-confident as a result of its technological advances. The ICBM launch on 4 July, which according to Trump should not have taken place, illustrates that the administration is unsure how to deal with the situation.

### **“It won't happen!” – And Now?**

In his 2017 New Year's speech, Kim announced that preparations for the test launch of an intercontinental missile were in their final stages. Trump responded the following day with a tweet that “it won't happen!”. Yet, Pyongyang flight-tested an ICBM for the first time on 4 July, making it a surprise “gift” for the US on Independence Day, according to propaganda from North Korea. The Hwasong-14 missile flew for 37 minutes in a lofted trajectory and then landed in the Japanese Sea, 930 kilometres from the launch site.

According to estimates by the Pentagon, this missile has an intercontinental range of 6,700 kilometres. Russia, on the other hand, designated it as a medium-range missile. On 28 July, Pyongyang tested yet another missile (according to Seoul: “a more advanced ICBM class”) which clearly had an intercontinental range of up to 10,000 kilometres. These types of missiles allow North Korea to threaten cities in the US.

The progress in developing missiles is significant. It remains doubtful, however, whether the missiles and their components would work under realistic conditions. Also, it is not clear whether North Korean engineers have mastered the mechanically and thermally demanding technology for re-entry vehicles. After all, besides transporting the warhead, delivering the weapon reliably to the target is the most important purpose of a missile and there are a number of possible sources of error here. Still, technologically simple explosive devices can be directed at a target area and projection data can be improved with further testing.

North Korea has demonstrated that it has an ICBM capability. It is, therefore, only a matter of time before the country is able to arm it with nuclear weapons. As an illegitimate but de facto nuclear-armed state, North Korea's behaviour threatens to further undermine the non-proliferation treaty (NPT) and to promote the proliferation of nuclear weapons and missile technology.

Since Kim firmly believes that nuclear-capable missiles are the only guarantee of survival for him and his regime, Pyongyang's technological developments will be continued and, without appropriate incentives or pressure not to do so, even intensified. Is there, however, potentially a red line that should not be crossed? If Kim continues to launch long-range missiles, possibly aimed at Guam, Seoul and Washington might respond by attempting to intercept them. A sixth, perhaps even atmospheric, nuclear weapons test, which would serve to improve warhead designs and increase explosive yields, would present an even greater provocation. Testing a hydrogen bomb, as the regime supposedly did in January 2016, would be similarly provocative. However, the current administration has refrained from officially defining a red line. The US government is under increasing pressure since, to date, it has only been reactive and not proactive – contrary to what Trump himself had promised.

### **Bad and Less Bad Options**

In general terms, there are four categories of options available to the US and its allies in order to initiate negotiations and prevent North Korea from further advancing its nuclear capabilities. These options can be sequenced and applied in combination. Yet, none of these options appear only by themselves as promising, each would be effective only to a limited extent and all would cost a lot.

### **1. Military intervention**

US Secretary of Defense, James Mattis, spoke of a "clear and present danger" with regard to North Korea, but avoided threatening pre-emptive strikes. The US has ample capacities in the Pacific to credibly increase the pressure on Pyongyang and, if necessary, to intervene militarily. The U.S. Pacific Command has sufficient military capabilities at its disposal and Washington can also send additional carrier strike groups and attack submarines. During his visit to South Korea in April 2017, Vice President Mike Pence recalled the US military attacks within Syria and Afghanistan, warning not to underestimate President Trump's determination as well as the strength of US forces. Nevertheless, weapons deployment remains the most dangerous and least promising option.

Potential targets in North Korea, such as command and control facilities, missile launch bases and nuclear weapons' sites are widely spread across the country. Many facilities and depots are buried deep underground; and a number of locations are even unknown due to the lack of intelligence (US satellites can only monitor one third of the country). It would thus be virtually impossible to destroy all these sites simultaneously with air strikes or special forces.

Any military intervention would, therefore, entail a great degree of uncertainty and risks. Even if limited strikes by the US focus on missile bases only, the conflict could quickly escalate and lead to hundreds of thousands of casualties. Around half of South Korea's population and many US soldiers and their families live in the metropolitan area of Seoul, which is within range of North Korean artillery. Furthermore, North Korean missiles can reach Tokyo and US bases in Japan. And finally, even an extensive military intervention would only delay, but not completely stop, Pyongyang's development of nuclear-capable, long-range missiles.

This outcome would be different in the case of a preventive war that includes a large-scale invasion of the country. But this

would require a massive contingency of US and allied forces. Such a new Korea war would be expected to last for weeks or even months and would have unforeseeable consequences. A war scenario employing only conventional weapons would likely claim at least one million lives (this number would dramatically increase should nuclear weapons be used).

## 2. Strengthening deterrence and defence

This option suggests that the US and its allies in the Asian Pacific region strengthen their capabilities to deter and defend against North Korea. This allows for increasing military pressure on North Korea, while avoiding the direct use of force. The US is already carrying out manoeuvres with South Korea's armed forces and has deployed additional fighters and bombers in the region. Additionally, the Trump administration is continuing cyber operations (the effectiveness of which remains unclear) to manipulate Pyongyang's missile launches which were intensified in 2014 under Obama. Also South Korea is planning to develop long-range ballistic missiles with explosive devices designed to hit underground targets. Some South Korean parliamentarians from the conservative opposition party are even calling for US tactical nuclear weapons to be re-deployed in the country.

The preferred choice of action is to strengthen missile defence systems within the trilateral alliance of the US, South Korea and Japan. This approach would also foster national US missile defences and is likely to be taken into account in the Pentagon's ongoing Ballistic Missile Defense Review (BMDR). North Korea's missile test on 28 July 2017 led Seoul to accelerate the deployment of THAAD. Japan is working to improve its BMD technology (Aegis and Standard Missile, SM) in order to provide its navy with new interceptor missiles in cooperation with the US company Raytheon (SM-3 Block IIa). Tokyo may also want to deploy land-based systems (Aegis Ashore).

The current US BMD systems have so far not been particularly successful against long-range ballistic missiles. Should US or Japanese Aegis BMD ships be used against a North Korean missile, this might reveal current deficits within the missile defence systems – or even trigger unintended reactions by actually fuelling an escalation instead of preventing it.

## 3. Implementing sanctions

The United Nations Security Council has by now established a complex sanctions regime against North Korea. However, it seems to be failing due to the lack of collective implementation as well as to Pyongyang's actions to circumvent these sanctions. As an example, North Korea was able to obtain foreign currency over a long period of time by running a hostel and convention centre in its embassy's compound in Berlin.

The consistent implementation of sanctions by China is crucial. However, its trade with North Korea did not decrease in the first quarter of 2017, but instead rose by 40 percent. Trump has consequently rated the statements made by Chinese President Xi Jinping in April 2017 at their joint meeting in Florida as unsatisfactory. However, ahead of the important National Congress of the Chinese Communist Party to be held in autumn 2017, Beijing will likely be unwilling to implement far-reaching sanctions against Pyongyang that might seriously jeopardize the Kim regime and, as a result, cause regional instability.

The US could, as it did in the case of Iran, increase pressure itself and impose unilateral secondary sanctions against Chinese banks and companies. Since 2009, international banks are said to have conducted business worth of 700 million dollars with companies connected to North Korea. Deutsche Bank and some major US banks have been targeted by the US Justice Department for conducting business with North Korean companies. In early July, the US Treasury Department imposed its own punitive measures against, among others, the

Bank of Dandong as well as a Chinese shipping company because both had traded with North Korea. By the end of August 2017, the US had imposed additional secondary sanctions on a number of Chinese and Russian firms trading with North Korean counterparts.

On 5 August, the UN Security Council unanimously imposed a new set of multi-lateral sanctions. These are intended to decimate an income worth one billion US dollars, which would be equivalent to one third of the value of North Korea's total exports. However, there is little hope that sanctions alone can change the behaviour of the North Korean regime.

#### **4. Take a chance on diplomacy**

Diplomacy with Pyongyang poses a normative dilemma: North Korea has undermined the international nuclear non-proliferation regime by controversially withdrawing from the Non-Proliferation Treaty (NPT) in 2003 while further developing its nuclear weapons programme. If the US administration would start negotiations with Pyongyang, that would be a de facto recognition of North Korea as a nuclear-armed state and honour its breach of international norms, which in turn could send the wrong signal to other rogue states.

As a result of this dilemma, no US administration has yet pursued a negotiating goal less ambitious than the complete, verifiable and irreversible denuclearization. The concern is that if North Korea's de facto nuclear weapons status were to be recognized, Japan or South Korea might consider producing nuclear weapons by themselves, which would further promote nuclear proliferation. As the Trump administration is also following this line, Washington does not consider a mere arms control regime with Pyongyang worthwhile.

Yet, pragmatic arms control measures, instead of disarmament, could result in a freeze of North Korea's nuclear weapons and missile advancements at the current level. This 'frozen' status, however, needs to

be verifiable. However, Pyongyang had last expelled inspectors from the International Atomic Energy Agency (IAEA) in 2002; to date, the regime continues to refuse international inspections or other verification measures. Even if a 'freeze' were enforceable, the risk of proliferating missile and nuclear weapons technology would remain.

In any scenario of negotiations, Pyongyang would certainly demand more and different concessions than it has in the past. Humanitarian aid and economic support were sufficient to convince North Korea to agree to a missile moratorium in 2012. Due to the regime's increased self-confidence, however, Pyongyang now considers direct, bilateral negotiations with Washington and an end of US-South Korean joint military exercises as equitable counter-offers. Although Washington and Seoul have rejected a halt of their bilateral manoeuvres, they might be willing to change the parameters of those exercises.

Pyongyang is no longer seeking bilateral security guarantees, since those were last given to North Korea by the US in the joint statement of the six-party talks in 2005. Instead, a potential, alternative option would be to formally end the Korean War. A peace treaty would replace the ceasefire agreement signed in 1953 by representatives of the US, China and North Korea. However, political resistance in Washington and Seoul would pose considerable obstacles to such efforts. The South Korean constitution would also need to be amended so that it recognizes the existence of two Korean states, which were simultaneously recognized by the United Nations in 1991. That North Korea's propaganda machine would likely portray the peace treaty as a victory over US imperialism would be the least of the downsides. Most importantly, a peace treaty would deprive Pyongyang of any reason to continue its nuclear weapons programme. At the same time, however, the alliance between Washington and Seoul as well as the deployment of US troops to South Korea would lose their legitimate justification.

Would the US be ready for such far-reaching concessions, which could weaken its dominant role in the Asia-Pacific region? So far, there is no indication that Washington wants to scale down its commitments in the Asia-Pacific region. In the South China Sea, for example, it continues to conduct Freedom of Navigation operations which are contesting China's claim to territorial waters surrounding its newly created outposts. Concerning the Taiwan issue, Washington is also not showing any willingness to make concessions, let alone agree to a transactional 'deal'. As a consequence, there is little reason to expect any fundamental changes within the Sino-US relationship, nor any bilateral progress on the Korean issue.

### **Pathways to Dialogue**

Like the Obama administration, the Trump administration will need some strategic patience against North Korea since military actions seem highly risky and successful negotiations will be tedious. Building up or rather continuing international pressure on Pyongyang is thus a first step to take. Here, China's attitude and cooperation is paramount. The question remains, however, whether Beijing – in the absence of major concessions from the US – will prefer to maintain the fragile status quo in which North Korea acts as a geopolitical buffer against the US presence in East Asia. The Chinese leadership will certainly not want to exert any great pressure and, ultimately, experience a re-unified Korea with US troops at the Yalu river. The North Korean regime knows about these fundamental geopolitical dissonances and understands how to skilfully push the limits of its weapons development.

Meanwhile, the focus is shifting towards the newly elected South Korean government. The US and China both support Seoul's leadership role with regard to North Korea. President Moon Jae-in made it clear in his Berlin speech on 6 July that he wants to build upon the 'Sunshine Policy' of his

predecessors Kim Dae-jung (1998–2003) and Roh Moo-hyun (2003–2008). The main focus of this approach to inter-Korean reconciliation is on humanitarian and economic issues. Moon expands this approach by aiming for a peace treaty with a nuclear weapon-free North Korea by 2020. He has announced a negotiating plan and other initiatives for achieving this goal. Furthermore, he has also promised to change South Korean law in order to incorporate the documents of previous and future inter-Korean summits, making them survive the change of presidential office-holders in Seoul every five years. The most recent high-level inter-Korean talks took place in August 2015 after a border incident and family reunions occurred in October 2015. After a fourth nuclear test in 2016, all military communication channels between Pyongyang and Seoul were cut off; the Kaesong industrial complex, one of the most important cooperation projects between North and South Korea, was shut down. Although President Moon wants to reopen Kaesong, the South Korean parliament is still debating whether this would be a responsible step – for years, there had been suspicions that the salaries of North Korean workers at Kaesong were, in fact, channelled to the North Korean Communist Party.

Like the US administration, Moon also believes in a dual-track policy towards Pyongyang, combining the offer of talks with increased pressure. With Trump's administration focusing merely on implementing and expanding sanctions, it seems to focus on the "maximum pressure" part of the dual-track policy. Moon's government, on the other hand, seems to try the engagement-part of the policy.

However, South Korean initiatives, such as the offer of inter-Korean military dialogue in mid-July, have not received any positive replies from their Northern counterparts. In fact, North Korea's official newspaper, Rodong Sinmun, mocked the South's offer and portrayed it as hypocritical. In doing so, Pyongyang is not only ignoring the real balance of power, but is also underestimat-



ing the escalating effect of its repeated and decades-old threats against Seoul and Washington – if the Kim regime really were to implement them, this would mean its own end.

Finally, it is also conceivable that the Trump administration will not officially accept the status quo, but come to terms with it over the course of time. In this case, the allies would increase their resources for regional deterrence and defence. In contrast to the Cold War, North Korea can expect asymmetric nuclear retaliation and annihilation if it ever launched a nuclear-equipped missile against the US. At the same time, this covert recognition of Pyongyang's nuclear-armed status would contradict the US's official commitments to South Korea and Japan, while fitting with Trump's 'America first' mantra. In theory, a commitment to extended nuclear deterrence becomes more credible, the less the need for its implementation – meaning, the fewer strategic resources North Korea has or the better equipped South Korea's armed forces are. Washington cannot ignore Pyongyang's already achieved and continuously improving capabilities; otherwise its security guarantees to Seoul and Tokyo lose credibility.

In the absence of persuasive alternatives on the part of the US, rapprochement between North and South Korea may act as a 'door-opener' to the nuclear issue between Washington and Pyongyang. North Korea, however, does not regard South Korea as an equal actor with regard to security politics. From the North Korean perspective, the US is the only partner with which it will discuss nuclear issues. Pyongyang denounces Seoul as a puppet regime of the US and considers itself the only independent Korean government entitled to bilateral talks with Washington. Therefore, a whole series of diplomatic steps is needed to ensure that, firstly, provocations cease, that inter-Korean rapprochement becomes viable and that, ultimately, dialogue with the US can take place. Close coordination between allies, on the one hand, and cooperation with China, on the other, will be crucial.

In any case, only a confidence-building policy of small steps over the next years can remove barriers and thereby promote rapprochement and, finally, peace. Moon seems to be on the right track to enabling the Trump administration to begin a dialogue "under the right circumstances". In doing so, it will be vital for him to keep the US on his side and also overcome any domestic controversies over exchanges with North Korea. South Korea's Sunshine Policy is still often criticized as a spending hole for Seoul and a source of funding for Pyongyang's arms. Also, the alliance between the US, South Korea and Japan is likely to be put under renewed stress.

Presumably, new formats are needed for possible negotiations between the US, North Korea and South Korea in order to involve China, to reassure Japan and to prevent Russia from carrying out disruptive action. Ideally, Beijing should not only be involved in sanctions, but also in any new security guarantees.

Germany will support a policy of reconciliation and non-proliferation. Although Pyongyang has none of its nuclear missiles aimed at Europe, it is in Berlin's interests that peace in Northeast Asia is maintained, that the NPT is bolstered and that the transfer of nuclear and missile technology is prevented.

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ISSN 1861-1761

*Translation by Martin Haynes*

(English version of  
SWP-Aktuell 58/2017)