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Issue Brief

North Korea's Nuclear Programme and Ballistic Missile Capabilities: An Assessment

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Following its last nuclear tests in 2016, North Korea has since carried out a string of ground and air launch tests of new rocket engines and ballistic missiles over the Sea of Japan and the Pacific Ocean. According to Troy Stangarone, senior director at the Korea Economic Institute, North Korea has "averaged 10.8 missile tests per year on the 2012-2016 period."¹

North Korea's nuclear programme has been a source of concern for the international community ever since it withdrew from the Nuclear-Non Proliferation Treaty in 2003 and took the path to nuclear weapons development. Despite concerted efforts to curtail its nuclear programme, Pyongyang has conducted five underground nuclear test on October 2006, May 2009, February 2013, January 2016 and September 2016.² It also has an advanced ballistic missile programme ranging from short to medium range ballistic missiles and there are reports that it has intercontinental ballistic missiles also under development.

North Korea has pursued a national security strategy based on asymmetric capabilities and weapons of mass destruction. Consequently, it has invested heavily in the development of increasingly longer range ballistic missiles, and the miniaturisation of its nuclear weapons stockpile. Relations have been hostile between North Korea and South Korea for decades.

Also, the US sees North Korea and its nuclear and missile programme as a threat to its interests and allies in the region - namely South Korea and Japan, as well as thousands of US troops stationed in the two countries. Relations between the US and North Korea reached an all time low since March 2017 when US-South Korea conducted a joint military exercise which Pyongyang sees as a threat. The US has gone as far as saying that all options including war are on the table to deal with North Korean nuclear and missile threat. North Korea has also used increasingly belligerent threats and rhetoric, bringing the peninsula under immense tensions.

This issue brief examines North Korean nuclear and ballistic missile capabilities, and whether its claims of having ballistic missiles that can strike US mainland hold true.

In order to launch a nuclear attack on its neighbours, North Korea needs to be able to make a nuclear warhead small enough to fit on to a missile. Although North Korea claims it has successfully miniaturised

¹ Troy Stangarone, "By the Numbers: The Frequency of North Korean Missile Tests Under Kim Jong-un", *The Peninsula*, Korea Economic Institute, June 9, 2017.

² "North Korea's nuclear programme: How advanced is it?", *BBC News*, January 6, 2017.

nuclear warheads, it has never been independently verified. Some experts have also cast doubts on its claims. However, it is reasonable to surmise that even if North Korea has not already achieved miniaturisation, it is working to achieve it and may successfully attain the capability in the next few years. Any threat of a nuclear strike is pretty much empty without the technology to mount a warhead on a missile. North Korea already has the ability to arm short and medium range ballistic missiles. However, miniaturisation is important for longer range missiles. Also, North Korea is estimated to have 50 kilograms of plutonium which would be enough for approximately 10 nuclear explosive devices. International Atomic Energy Agency Director-General Yukiya Amano said in March 2017 that North Korea has doubled its capacity to produce highly enriched uranium. By some estimates, this means that North Korea may have enough fissile material for 100 warheads by 2020.³

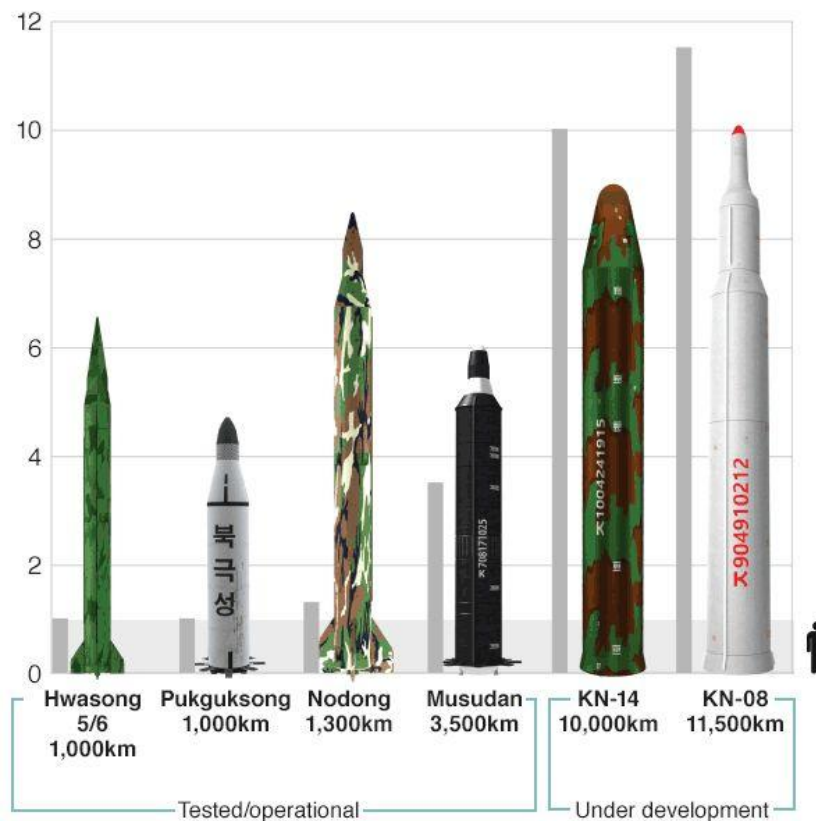
North Korea has also been working and investing in developing an array of missiles. North Korea's short- and medium-range systems include artillery and short-range rockets, including Scud missiles, No-Dong systems, and a newer mobile solid-fueled SS-21 variant called the KN-02 with 120-170 km. It also has the 1200 km range KN-11 submarine launched ballistic missile (SLBM) under development. North Korea has also made some progress towards long-range missile technology under its Unha (Taepo-Dong 2) space launch programme. It has, thus, demonstrated an ability to put crude satellites into orbit. North Korea is also developing two other intercontinental ballistic missiles (ICBM), the KN-08 and KN-14, which it claims have the ability to deliver nuclear weapons to US territory.⁴ However, these ICBMs have not been flight tested and North Korea is still years away from having operational missiles with warhead technology that can target the US mainland.

³ Daryl Kimball, "Curbing the North Korean Nuclear Threat," *Arms Control Today*, Vol. 47, April 2017

⁴ "Missiles of North Korea," <https://missilethreat.csis.org/country/dprk/>

What missiles does North Korea have?

Maximum range in km (000's)



Source: James Martin Center for Nonproliferation Studies / NTI

BBC

At present, the only operational missiles that North Korea have are the 1000 km range Hwasong and Pukguksong and the 1300 km range Nodong. Both South Korea and Japan fall within the striking range of these missiles. Pyongyang has also tested the Musudan with 3,500 km range. Its KN-14 with 10,000 km range and KN-8 with 11,500 km range are under development. These ICBMs, once operational, would be able to target most of the US mainland.

North Korean missile ranges



In sum, North Korean ballistic missiles can already target South Korea, Japan and the thousands of US troops stationed there. However, its ability to target US mainland is still years away. If North Korea keeps developing its missiles, it will achieve the ability to target the US in perhaps a decade or two. In the meantime, it would be prudent to engage North Korea in talks in order to halt and eventually reverse its nuclear programme. The current US hardening of stance against North Korea and threatening war does not seem to have worked. It has only escalated tensions on the Korean peninsula, whereby war could become a distinct possibility. A war with nuclear-capable North Korea would be counterproductive. The dozens of missile tests that North Korea has conducted over the last few years have been aimed at improving its missile technology on the one hand, and on the other are also used as signals to the US and its allies that North Korea is not afraid and is willing to use its array of weaponry, even against the US.

North Korea has indeed made tremendous strides in its missile technology. Tensions on the Korean peninsula can only be de-escalated through diplomacy and an improvement of relations between North Korea and the US on one hand, and South Korea and Japan on the other. Perhaps a starting point could be halting the annual US-South Korea military exercises that threaten North Korea. Instead of pursuing a spiral of threats and hostilities, a string of diplomacy and engagement might yield better outcomes with North Korea.