

North Korea's Nuclear Programme

A briefing by **BASIC**

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Introduction

North Korea has the smallest, most basic nuclear weapons programme in the world. They may have 13-21 small-yield nuclear weapons with uncertain delivery options.¹ The situation appears intractable. Multilateral sanctions have so far failed to deter weapons development, and fears of instability in the region stymie other options. Supreme Leader Kim Jong-un's colourful language, extravagant propaganda and public field inspections sometimes make him a figure of ridicule, but his country's nuclear policy presents a significant and uncertain threat.



*Missile on parade during 'Victory Day' 26 July 2013
Photo (cc) Stefan Krasowski*

Background

Early ambitions

The Democratic People's Republic of Korea (DPRK) was established in 1948 under the Provisional People's Party leader Kim Il-sung and based on a Stalinist political and ideological structure still evident today.²



North Korea and its neighbours Map (cc) Burmesedays

Occupation by Japan from 1910-1945, and the subsequent Korean War (1950-53), left the new communist state isolated, paranoid and resistant to foreign intervention. North Korea courted both China and the Soviet Union, and discussed assistance in building an independent nuclear arsenal to deter foreign military threats, particularly from South Korea, Japan, and the United States.³ At this point, South Korea also had an early nuclear weapons programme. Construction started on the DPRK's Yongbyon Nuclear Scientific Research Centre in 1953.⁴ North Korea's current nuclear program has enjoyed "only marginal and intermittent foreign assistance."⁵ The state joined the Nuclear Non-Proliferation Treaty in 1985 and agreed to limited IAEA inspections in 1988.

The 1990s

Relations between North and South Korea appeared to be improving in 1991 when they signed an 'Agreement on Reconciliation, Nonaggression, Exchanges and Cooperation' and the 'Joint Declaration on the Denuclearization of the Korean Peninsula,' which prohibited the testing, manufacture, possession or use of nuclear weapons and facilities for nuclear reprocessing and uranium enrichment. Accordingly, President Bush Sr. removed US nuclear weapons from South Korea.

- 1 David Albright and Serena Kelleher-Vergantini, "Plutonium, Tritium, and Highly Enriched Uranium Production at the Yongbyon Nuclear Site," *Institute for Science and International Security* (2016): http://isis-online.org/uploads/isis-reports/documents/Pu_HEU_and_tritium_production_at_Yongbyon_June_14_2016_FINAL.pdf
- 2 The World Factbook, "North Korea," *Central Intelligence Agency* (2016): <https://www.cia.gov/library/publications/the-world-factbook/geos/kn.html>
- 3 David Chance, "Kim Jong-un, North Korean Leader, Calls Nuclear Weapons a 'Reliable War Deterrent,'" *The Huffington Post* (2013). *The World Post*, "Kim Jong un, North Korean Leader, Calls Nuclear Weapons a 'Reliable War Deterrent,'" *The Huffington Post* (2013): www.huffingtonpost.com/2013/04/01/kimjongunnorthkoreanuclearweaponspeech_n_2996212.html
- 4 Hamish Macdonald, "Yongbyon's history marked by accidents and human experimentation," *NK News* (2013): <https://www.nknews.org/2013/09/yongbyons-history-marked-by-accidents-and-human-experimentation/>
- 5 Clemens Jr., Walter C., "North Korea's Quest for Nuclear Weapons: New Historical Evidence," *Journal of East Asian Studies* 10 (2010): www.jstor.org/stable/23418882

By 1993 there were accusations that North Korea was cheating on its commitments. The DPRK denied IAEA access to its facilities and then formally withdrew its IAEA membership. This was partially resolved by the DPRK-US Agreed Framework (1994), a strategic bargain in which the US agreed to replace the DPRK's graphite-reactor with two light water reactors (LWRs), under a new organisation called the Korean Peninsula Energy Development Organisation (KEDO), in exchange for the normalising of relations between the North and South, the DPRK's continued participation in the NPT, and a halt to its nuclear weapons programme. The fragile agreement didn't last, however; the US accused the DPRK of further cheating, while the latter accused the US of unacceptable construction delays for the KEDO project, which was abandoned altogether in 2006.

The 2000s to the Present

South Korea's 'Sunshine Policy' under President Kim Dae-jung helped improve relations and cooperation between the two states after 1998, but this policy was abandoned by his successor Lee Myung-bak in 2007. North Korea's pursuit of nuclear weapons and ballistic missiles (in spite of heavy multilateral sanctions) has caused relations to sour over recent years. George W. Bush's 2002 State of the Union address inflamed tensions by stating that North Korea and other rogue states constituted an "axis of evil." Revealing evidence of North Korea's uranium enrichment programme, the US cut off oil shipments, the DPRK then expelled IAEA inspectors and abrogated from the NPT on the 10 January 2003. North Korea declared its nuclear weapon programme by July, and two years later announced that it had "produced nuclear weapons" for self-defence. In defence of the programme Kim Jong-il referred to the vulnerability of Saddam Hussein and Muammar Gaddafi when they had given up their WMDs.

The Six Party Talks between North and South Korea, China, Japan, Russia and the United States attempted to find common ground that would result in the DPRK re-signing the NPT and complying with IAEA standards.⁶ Six rounds of negotiations produced little net progress and have not been resumed since 2009. Following the death of his father two years later, Kim Jong-un assumed leadership, has overseen violent crackdowns and has continued to prioritise North Korea's nuclear weapons and ballistic missile programmes.⁷



Important Dates

North Korea has conducted four underground nuclear weapons tests at Punggye-ri Nuclear Test Site – in 2006, 2009, 2013 and 2016⁸ – and several rounds of ballistic missile tests, with mixed success.⁹ These have included the Scud-type MRBM Rodong-1 and Musudan (Hwasong-10), ICBMs such as the Taepodong-2 and -3, and their new SLBM KN-11, the full range of which is unknown but which tests have shown to be at least 30 km.¹⁰ Each round of testing has provoked condemnation and sometimes sanctions from the UN Security Council, though at best these have only stalled the slow but steady progress of North Korea's nuclear programme. The following is a chronological outline of the country's most significant tests as well as other key dates.

5 July 2006: North Korea was confirmed to have **launched at least seven ballistic missiles** of three varieties: the Nodong-A, Scud-C, and Taepodong-2.¹¹ The UN Security Council condemned the launch, called for the DPRK to reinstate its moratorium on missile launches, and to rejoin the Six Party Talks, NPT, and IAEA.¹²

- 6 "Joint Statement of the Fourth Round of the Six Party Talks," *US Department of State* (2005): <http://www.state.gov/p/eap/regional/c15455.htm>
- 7 Andrew Lankov, "Kim Jong-un: What we know about the North Korean leader," *Al Jazeera* (2016): <http://www.aljazeera.com/indepth/opinion/2016/01/kim-jong-north-korean-leader-160104121310318.html>
- 8 "North Korea nuclear tests: what did they achieve?" *BBC News* (2016): <http://www.bbc.co.uk/news/world-asia-17823706>
- 9 A table of missile characteristics as of July 2014 is available from the Nuclear Threat Initiative, but does not include the new SLBM test in April 2016: http://www.nti.org/media/pdfs/design_characteristics_of_north_korea_ballistic_and_cruise_missiles.pdf?_=1406744044
- 10 Ankit Panda, "North Korea Tests Solid Fuel Submarine Launched Ballistic Missile," *The Diplomat* (2016): <http://thediplomat.com/2016/04/north-korea-tests-solid-fuel-submarine-launched-ballistic-missile/>
- 11 North American Aerospace Defense Command and US Northern Command Public Affairs, "U.S. Northern Command confirms 7th missile launch by DPRK," *U.S. Northern Command* (2006): <http://www.northcom.mil/Newsroom/Article/563299/us-northern-command-confirms-7th-missile-launch-by-dprk/>
- 12 UN Security Council, "Security Council Condemns Democratic People's Republic of Korea's Missile Launches, Unanimously Adopting Resolution 1695 (2006)," *United Nations* (2006): <http://www.un.org/press/en/2006/sc8778.doc.htm>

9 October 2006: First nuclear test

The bomb's yield was estimated to be below 1 kt and to have been made of plutonium.¹³ The test was confirmed nuclear, though suspected to have been a "fizzle" (partial fission). Five days later, the UN Security Council issued UNSCR 1718 (14 October 2006), which enacted an arms embargo, froze assets, placed a travel ban on certain North Korean representatives and promised "serious repercussions" if testing continued.¹⁴

25 May 2009: Second nuclear test

North Korea's second nuclear test had an estimated yield of 2.35 kt, though Pyongyang claimed it was equivalent to Hiroshima (~15 kt).¹⁵ The test violated UNSCR 1718, prompting the unanimous passing of UNSCR 1874 (12 June 2009), strengthening sanctions and vessel inspections on "reasonable grounds."¹⁶

12 February 2013: Third nuclear test

North Korea's third nuclear test demonstrated a marked increase of yield to 6-9 kt. UNSCR 2094 expanded travel bans and financial assets freezes, placed strict limitations on financial services and North Korean banking abroad, and targeted North Korean elites by regulating luxury goods imports.¹⁷

6 January 2016: Fourth nuclear test

The DPRK initially claimed to have successfully tested a hydrogen bomb, though expert analysis suggested it was most likely a boosted fission weapon. UNSCR 2270 (2 March 2016) prohibited the teaching of proliferation-sensitive subjects to North Korean nationals abroad, and instructed member states to conduct cargo inspections and to prohibit the supply and sale of aviation fuel, coal, iron, iron ore and rare minerals.

9 March 2016: North Korea claimed to have created a "miniature" nuclear warhead, small enough to fit on a ballistic missile, although this is difficult to verify with the pictures available alone.¹⁸

April-June 2016: Musudan missile tests

North Korea conducted numerous failed ballistic tests in April and May 2016.¹⁹ The first successful Musudan test launch may have been achieved on 21 June, flying 400 km on a high trajectory to avoid Japanese airspace. This poses a new threat to South Korea, Japan, the Philippines, China and the US Pacific territory of Guam.²⁰

23 April 2016: KN-11 SLBM test launch

North Korea's submarine-launch ballistic missile test apparently flew 30 km.²¹ According to Schilling, this suggests that DPRK scientists may have moved to a more stable solid-propellant based system and that North Korea's SLBM may be deployed in 2020; however, North Korea's submarines are relatively easy to detect and are vulnerable, so are unlikely to venture far out of territorial waters.²²

"Nuclear development does not offer the path to survival but will merely hasten the regime's collapse."

- Park Geun-hye, President of South Korea, 16 February 2016²³

13 Lian-Feng Zhao, Xiao-Bi Xie, Wei-Min Wang, and Zhen-Xing Yao, "Regional Seismic Characteristics of the 9 October 2006 North Korean Nuclear Test, Bulletin of the Seismological Society of America, December 2008 98:2571-2589, <http://www.bssaonline.org/content/98/6/2571.short>

14 UN Security Council, "Resolution 1718," *United Nations* (2006): [http://www.un.org/en/ga/search/view_doc.asp?symbol=S/RES/1718\(2006\)](http://www.un.org/en/ga/search/view_doc.asp?symbol=S/RES/1718(2006))

15 Lian-Feng Zhao, Xiao-Bi Xie, Wei-Min Wang and Zhen-Xing Yao, "Yield Estimation of the 25 May 2009 North Korean Nuclear Explosion," *Seismological Society of America* (2009): <http://www.bssaonline.org/content/102/2/467.abstract?sid=7c76920-2dfc-45b2-96d7-73fef9aa8d48>. Justin McCurry and Tania Branigan, "North Korea tests nuclear weapon 'as powerful as Hiroshima bomb,'" *The Guardian* (2009): <https://www.theguardian.com/world/2009/may/25/north-korea-hiroshima-nuclear-test>

16 UN Security Council, "Resolution 1874," *United Nations* (2009): [http://www.un.org/en/ga/search/view_doc.asp?symbol=S/RES/1874\(2009\)](http://www.un.org/en/ga/search/view_doc.asp?symbol=S/RES/1874(2009))

17 UN Security Council, "Resolution 2094," *United Nations* (2013): [http://www.un.org/en/ga/search/view_doc.asp?symbol=S/RES/2094\(2013\)](http://www.un.org/en/ga/search/view_doc.asp?symbol=S/RES/2094(2013))

18 "North Korea 'has miniature nuclear warhead,' says Kim Jong-un," *BBC News* (2016): <http://www.bbc.co.uk/news/world-asia-35760797>

19 Julian Ryall, "North Korean missile launch 'fails' as country marks key anniversary," *The Telegraph* (2016): <http://www.telegraph.co.uk/news/2016/04/15/north-korean-missile-blew-up-on-launch-as-country-marks-key-anni/>

20 Justin McCurry, "North Korea: UN security council 'to meet' after missile tests," *The Guardian* (2016): <https://www.theguardian.com/world/2016/jun/21/north-korea-launches-missile-but-test-appears-to-have-failed>

21 Don Melvin, Jim Sciotto and Will Ripley, "North Korea launches missile from submarine," *CNN* (2016): <http://edition.cnn.com/2016/04/23/asia/north-korea-launches-missile-from-submarine/>

22 John Schilling, "A New Submarine-Launched Ballistic Missile for North Korea," *US Korea Institute at SAIS* (2016): <http://38north.org/2016/04/jschilling042516/>

23 President Park Geunhye, "2016 Address by President Park Geunhye to the National Assembly on State Affairs," *The National Committee on North Korea* (2016): <http://www.ncnk.org/resources/publications/2016-address-by-president-park-geun-hye-to-the-national-assembly-on-state-affairs/>

International Relations

Republic of Korea (ROK or South Korea)

Since the Korean Peninsula officially split along the 38th parallel after WWII, both Koreas have typically acted in strong opposition to one another, each hoping for unification under their respective leadership. A state of war continues to exist officially between the two states.

China

Over 70% of the DPRK's trade is with China.²⁴ China's primary goal is to prevent the DPRK from complete state collapse, which would result in massive migration. China has recently released a statement strongly condemning the 2016 tests, indicating a shared interest in limiting, or at least containing, North Korea's nuclear capabilities.

United States

Relations between the DPRK and the US have been tense, if not hostile, since the latter's support for South Korea in the Korean War. The Obama Administration has adopted a policy of "strategic patience," which levies strict economic sanctions against the political establishment and elites in an attempt to pressure the regime to enter peaceful talks with South Korea and to rejoin the Six-Party Talks.²⁵ 'According to a 2014 Defense Department report to Congress the US is very concerned about North Korea's aggressive tests as well as its "demonstrated willingness to proliferate nuclear technology" to states of concern.'²⁶

24 Eleanor Albert and Beina Xu, "The China-North Korea Relationship," *Council on Foreign Relations* (2016). <http://www.cfr.org/china/china-north-korea-relationship/p11097>

25 Emma ChanlettAvery, Ian E. Rinehart and Mary Beth D. Nikitin, "North Korea: U.S. Relations, Nuclear Diplomacy, and Internal Situation," *Congressional Research Service* (2016): <https://www.fas.org/sgp/crs/nuke/R41259.pdf>

26 Daniel Wertz and Matthew McGrath, "North Korea's Nuclear Weapons Program," *The National Committee on North Korea* (2016): <http://www.ncnk.org/resources/publications/DPRK-Nuclear-Weapons-Issue-Brief>

27 Mark E. Manyin, "Japan North Korea Relations: Selected Issues," *Congressional Research Service* (2003): <http://fpc.state.gov/documents/organization/27531.pdf>

28 Glyn Davies, "U.S. Policy Towards North Korea," *Subcommittee on Asia and the Pacific, House Committee on Public Affairs, U.S. Department of State* (2014): <http://www.state.gov/p/eap/rls/rm/2014/07/229936.htm#>

29 Daniel R. Russel, "North Korea: How to Approach the Nuclear Threat," *U.S. Department of State* (2016): <http://www.state.gov/p/eap/rls/rm/2016/04/255492.htm>

30 Joseph S. Bermudez Jr., "New Possible Indication of North Korean Nuclear Test Preparations," *38 North* (2016): <http://38north.org/2016/05/punggye050616/>

Russia

The collapse of the Soviet Union in 1991 damaged the DPRK's confidence and pushed the country to pursue nuclear weapons development independently. Today, the two countries retain strong ties despite a history of mixed relations.

Japan

The legacy of Japan's occupation of the DPRK from 1910-45 looms heavily in North Korea public memory, and the countries have not had official relations since liberation. The US considers Japan a strong ally in deterring North Korea's nuclear ambitions. There were hopes of improved relations in 2002, when Japanese Prime Minister Junichiro Koizumi and DPRK leader Kim Jong-Il met for a one-day summit. This concluded with the Pyongyang Declaration, in which North Korea promised to indefinitely extend its moratorium on missile testing and Japan formally apologised for its occupation. Both countries share a sense of distrust but continue to trade, with Japan serving as the DPRK's third-largest trading partner.²⁷

United Kingdom

The United Kingdom was not a member of the six party talks and does not play a weighty role, but works closely with the US and allies in North Korean counter-proliferation with the goal of the denuclearisation of the Korean Peninsula. Unlike the US, however, Britain does hold official relations with the DPRK.

The Future

The US, South Korea, and their allies continue to reaffirm their commitment to re-opening the Six-Party Talks on the condition that the DPRK displays its commitment for denuclearisation and peace on the Korean Peninsula. Therefore direct negotiations are extremely unlikely, with the US stating that it will not "engage in talks for the sake of talks."²⁸

Critics of the Obama Administration's "strategic patience" argue that the policy is too passive and effectively gives the DPRK control over negotiations, but alternative approaches look very difficult. A State Department official has recently observed that Russia and China appear "no longer interested or willing to defend this increasingly erratic" regime.²⁹

The Security Council, the US, and its allies have imposed increasingly tight economic sanctions against the DPRK, heavily damaging its economy and may have actually strengthened the country's resolve to achieve full nuclear capabilities. Satellite imagery of Punggye-ri Nuclear Test Site indicates that a fifth nuclear test may occur in the near future.³⁰