IX. North Korea's military nuclear capabilities

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The Democratic People's Republic of Korea (DPRK, or North Korea) demonstrated a military nuclear capability by carrying out underground nuclear test explosions in October 2006 (with an estimated yield of less than 1 kiloton) and May 2009 (estimated yield of about 2–3 kt).[1] In both tests the estimated yield of the explosions was much lower than the yields of the initial nuclear tests conducted by other states. The US intelligence community called the 2006 test a failure and considered that the 2009 test 'was apparently more successful than the 2006 test'.[2] One expert has hypothesized, based on radionuclide signatures that were collected by monitoring stations in Japan, South Korea and Russia in May 2010, that North Korea may have carried out two very low yield nuclear test explosions during that month.[3]

At the end of 2010 North Korea was estimated to have roughly 30 kilograms of plutonium separated from the spent fuel of its 5-megawatt-electric graphite-moderated research reactor at Yongbyon (see section X below).[4] This would be sufficient to construct up to eight nuclear weapons, assuming that each weapon used 4–5 kg of plutonium and depending on North Korea's design and engineering skills. North Korea may have obtained weapon design assistance from the A. Q. Khan network.[5]

According to a leaked report prepared in 2011 by the United Nations Security Council's panel of experts on North Korea, the country has pursued a uranium enrichment programme 'for several years or even decades'.[6] In November 2010 a visiting delegation of US scientists was shown a previously undisclosed centrifuge enrichment facility, located in a former metal fuel rod fabrication building at Yongbyon.[7] According to the

[1] See Fedchenko, V., 'North Korea's nuclear test explosion, 2009', SIPRI Fact sheet, Dec. 2009, <http://books.sipri.org/product_info?c_product_id=397>.

[2] 'Annual threat assessment of the US intelligence community for House Permanent Select Committee on Intelligence: Dennis C. Blair, Director of National Intelligence', Statement for the record, 3 Feb. 2010, <http://dni.gov/testimonies_2010.htm>, p. 14.

[3] The analysis suggested that North Korea may have tested materials and techniques intended to boost the yield of its fission devices. De Geer, L.-E., 'Radionuclide evidence for low-yield nuclear testing in North Korea in April/May 2010', *Science & Global Security*, vol. 20, no. 1 (2012).

[4] Hecker, S. S., 'A return trip to North Korea's Yongbyon nuclear complex', Center for International Security and Cooperation, 20 Nov. 2010, <http://cisac.stanford.edu/publications/north_koreas_yongbyon_nuclear_complex_a_report_by_siegfried_s_hecker/>.

[5] On the Khan network, led by Pakistani scientist Abdul Qadeer Khan, see Fitzpatrick, M. (ed.), *Nuclear Black Markets: Pakistan, A. Q. Khan and the Rise of Proliferation Networks*, International Institute for Strategic Studies (IISS) Strategic Dossier (Routledge: Abingdon, 2007).

[6] Panel of experts established pursuant to Resolution 1874 (2009), Report, p. 20. The leaked report is available at <http://www.scribd.com/doc/55808872/UN-Panel-of-Experts-NORK-Report-May-2011>.

[7] Hecker (note 4).

UN panel of experts' report, it was 'highly likely that one or more parallel covert facilities capable of LEU [low-enriched uranium] or HEU [highly enriched uranium] production exist elsewhere' in the country.[8] The panel also judged that North Korea was likely to possess other covert facilities for processing and converting uranium feedstock to a form usable in gas centrifuges as well as for manufacturing the centrifuges. It is not known whether North Korea has produced HEU for use in nuclear weapons.

[8] Panel of experts established pursuant to Resolution 1874 (note 6), p. 20.