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Issue Brief

How North Korea was Armed

Prabha Rao

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Summary

China and to a lesser extent Pakistan have helped North Korea with its nuclear and missile development programmes. In return, Pakistan has gained considerably on account of the nuclear and missile cooperation with North Korea, with serious security implications for India. While an uneasy equilibrium currently exists in East Asia, the burgeoning US-China rivalry will ensure that the current standoff in the Korean peninsula will not be resolved anytime soon. Kim Jong-Un will continue to exploit the current situation in the region to consolidate his regime's political power.

The *enfant terrible* of international politics, North Korean President Kim Jong-un, has a talent for generating war clouds and intercontinental nightmares. The Kim dynasty, which has tenaciously held on to power in the face of international condemnation, has two major foreign policy narratives — ‘*Juche*’ (self-reliance), and secure independence. These narratives have led the country into aggressive nuclear and missile sabre-rattling. Such sabre-rattling has intensified since Kim Jong-un assumed power in 2011. While North Korea carried out 15 missile tests under Kim Il-sung and 16 under Kim Jong-Il, it has, as of mid-September 2017, conducted 85 tests under Kim Jong-un.¹

But the most significant development has been North Korea’s development of thermonuclear capability. On January 3, 2016, it carried out a hydrogen bomb test, its fourth nuclear test overall. It has been alleged that Pakistan had assisted North Korea in the development of this capability, which can be discerned from the similarities between the instrumentation bunkers at Punggye-ri and Pakistan’s RasKoh nuclear testing complex.² This was followed by Kim Jong-un’s claim in March 2016 that his country has miniaturised nuclear warheads for fitting onto ballistic missiles. On September 10, 2016, North Korea detonated a nuclear warhead, which the South Korean Meteorological Administration estimated had a yield of 10 kilotons.

While alternately accusing the United States of driving the Korean peninsula towards a nuclear war and threatening a nuclear strike on the ‘heart of the US’, North Korea detonated an advanced, two-stage, hydrogen bomb on September 3, 2017 (the sixth nuclear test since 2006) with an yield of over 120 kilotons at a test site in Sungjibaegam, close to the previous testing site at Punggye-ri. The Korean Central News Agency (KCNA) warned that the test was of a multi-functional thermonuclear weapon which could be detonated at high altitudes to generate a potent Electro-Magnetic Pulse (EMP) that would wipe out electrical grids from Japan to the US.³ The latest test has renewed fears about North Korea’s claimed cache of around 60 nuclear weapons and the considerable progress that it has made towards their miniaturization.

According to a database maintained by the Nuclear Threat Initiative, North Korea tested 26 missiles in 2016; 16 of those tests were successful and 10 were failures.

¹ Debra Killalea, “North Korea: How many missiles has Kim Jong-un launched?,” September 19, 2017, <http://www.news.com.au/technology/innovation/north-korea-how-many-missiles-has-kim-jongun-launched/news-story/c510a3d63ed1ec38ab3b09199b6f5f4e>

² “North Korea claims to have tested hydrogen bomb,” *The Hindu*, January 6, 2016, <http://www.thehindu.com/news/international/North-Korea-claims-to-have-tested-hydrogen-bomb/article13984559.ece>

³ “North Korea Threatens To Blackout Mainland US w/Nuclear Electro-Magnetic Pulse Weapon,” September 6, 2017, <https://therearenosunglasses.wordpress.com/2017/09/06/north-korea-threatens-to-blackout-mainland-us-w-nuclear-electro-magnetic-pulse-weapon/>

There have been 19 tests in 2017 so far, with 13 successes.⁴ The 68 per cent success rate would be commendable in any country. The frequency of the tests suggests that North Korea is confident of its supply of missiles and has the necessary resources and capabilities to make them at will. Such an achievement is not just improbable, but impossible without sustained outside help, indicating thereby that UN sanctions and embargoes against Pyongyang have been violated in fact, spirit and intent.

Missile Programme on a Very Fast Track

North Korea's missile programme has made unprecedented advances since Kim Jong-un's ascendance to power. It has progressed from short-range missiles like the *Nu-Dong* (some of which were bought with hard cash by Pakistan according to former President Pervez Musharraf and were rechristened as the *Ghauri* missiles), to the intermediate-range ballistic missiles (IRBM) *Musudan* (which repeatedly failed flight tests) and the *Hwasong-12*, and ultimately, the intercontinental ballistic missile (ICBM) *Hwasong-14*. The latter two missiles use a powerful liquid-propellant engine (LPE).⁵

On May 14, 2017, North Korea launched the *Hwasong-12*, which flew on a steep trajectory, reaching a peak altitude of over 2,000 kilometres. If the *Hwasong-12* had used a normal flight path, it would have travelled between 4,000 and 4,500 kilometres, thus placing Guam (3,400 kilometres away) within range. On July 4, to coincide with the US Independence Day, the two-stage *Hwasong-14* was launched, reaching an apogee of 2,700 kilometres. A second *Hwasong-14* was tested on July 28 reaching an apogee of about 3,800 kilometres.⁶ Had these missiles been flown on trajectories, which privileged distance rather than height, they would have reached about 7,000 kilometres and 9,000 kilometres, respectively, well above the 5,500 kilometres minimum distance for a system to be categorised as an ICBM. At these distances, major US cities fall within range of these missiles.

On August 28, 2017, North Korea launched a second *Hwasong 12* from close to the Sunan Airport in Pyongyang. The missile overflew Cape Erimo in Hokkaido, Japan, before impacting in the Pacific Ocean. Significantly, three different objects splashed down in the Pacific Ocean.⁷ A *Hwasong 14* missile was *test-fired on September 14, 2017, which again traversed Japanese airspace and caused multiple splashes in the*

⁴ Nuclear Threat Initiative, "North Korea," (last updated September 2017), <http://www.nti.org/learn/countries/north-korea/>

⁵ Michael Elleman, "The secret to North Korea's ICBM success," *IISS Voices*, August 14, 2017, <http://www.iiss.org/en/iiss%20voices/blogsections/iiss-voices-2017-adeb/august-2b48/north-korea-icbm-success-3abb>

⁶ *Ibid.*

⁷ "North Korea: ballistic missile launched over Japan – as it happened," *The Guardian*, September 16, 2017, <https://www.theguardian.com/world/live/2017/sep/15/north-korea-launches-missile-over-japan-live-updates>

Pacific. It was clear from the multiple splashes during these tests that the *Hwasongs* are capable of carrying multiple payloads, that is, they could carry multiple independently targetable re-entry vehicles (MIRVs).

The Smuggling Network

How did Pyongyang get a LPE? There is no evidence to suggest indigenous production. A study of the missile's structure, which has two stages with a lift-off mass of about 75 tonnes and special fuel — Kerosene and AK 27 (a mixture of Red Fuming Nitric Acid and Nitrogen Tetroxide)⁸ — has led to the conclusion that the *Hwasong* engines are a variant of the RD-250 turbo pump, which is manufactured at Russia's Energomashconcern and Ukraine's KB Yuzhnoye. The original RD-250 has a dual combustion chamber, which has been modified into a single chamber in the *Hwasong*. The needle of suspicion points towards KB Yuzhnoye as, according to witnesses, a single chamber RD-50 model was on display at KB Yuzhnoye in 2016.⁹

How was the RD 250 proto-type engines transported from Ukraine, when stringent international sanctions were in place? The answer lies with smuggling networks in China and Pakistan, which have with impunity violated non-proliferation rules and regimes. A total of 5233 Chinese companies have traded (including in dual-use technology) with North Korea between 2013 and 2016. One example of an actual smuggling initiative is the case of the Chinese company Dandong Dongyuan Industrial Co. Ltd., which exported US \$28.5 million worth of material to North Korea during 2013-2016, including a shipment of \$790,000 worth of 'radio navigational aid apparatus' in June 2016. According to experts at the James Martin Centre for Non-proliferation Studies, the goods probably included guidance devices for ballistic missiles. The Hong Kong business registry states that the firm's owner is Sun Sidong, a Chinese national. A ship that was owned by Sun Sidong — Jie Shun — was seized last year by Egyptian authorities. It was carrying 30,000 North Korean-made rocket propelled grenades concealed under a cargo of iron ore.¹⁰ It was found that the ownership of the vessel had recently changed and the present registered owner was one Sun Sihong, who listed her residential address as an apartment in the same complex as Sun Sidong!

China has also supplied six transporter-erector-launcher (TEL) trucks, which are designed to move and fire ballistic missiles. Such a mobile system makes satellite

⁸ S. Chandrashekar, Rajaram Nagappa, N. Ramani, "The Hwasong 12- A MIRV Missile to Counter US BMD Systems," September 2017, <http://issp.in/wp-content/uploads/2017/09/The-Hwasong-12%E2%80%93A-MIRV-Missile-to-Counter-US-BMD-Systems.pdf>

⁹ Ibid, n. 5.

¹⁰ Reuters, "North Korea's Complex Sanctions-Evading Network Could Be Defeated by 'Targeting a Few Chinese Firms'," *Fortune*, June 13, 2017, <http://fortune.com/2017/06/13/north-korea-sanctions-evasion-china-trade/>

surveillance difficult. The trucks were made by China's Hubei Sanjiang Space Wanshan Special Vehicle Company, which is a subsidiary of China Aerospace Science and Industry Corp, a state-owned company that makes the Shenzhou rocket as well as missiles.¹¹ When questioned about the sale, China mendaciously gave a written submission to the UN with a copy of the end-user certificate provided by North Korea that the vehicles had been imported for the purpose of transporting timber! This year, North Korea has used another Chinese truck model, made by Sinotruk, to tow a submarine-launched ballistic missile (SLBM).¹²

North Korea-Pakistan Nexus

A cause for serious disquiet is that the bi-conic warhead design of the *Hwasong* missiles appears similar to the warhead on Pakistan's Ababeel missile, which has MIRV compatibility. The warhead has reportedly been made with Chinese help, and designs or the warhead itself has been supplied to Pyongyang from Pakistan.¹³ Cooperation between Pakistan and North Korea is long standing, and there is evidence that Benazir Bhutto, former prime minister of Pakistan, visited Pyongyang in 1993 and procured several computer disks containing blueprints for the No-Dong missile, which she delivered to A.Q. Khan.¹⁴ This missile, which was smuggled to Iran, re-appeared as Shabab-3 and in Pakistan as Hatf-V. North Korean design features are also visible in the Hatf-IX missiles, which are being used by Pakistan as tactical weapons to be deployed along the Indian border (especially in Gujranwala).

Missile-related developments in Pakistan are especially worrying but not as worrying as the illicit nuclear network between Pyongyang and Islamabad, with Beijing serving as the pivot. Galaxy Corporation Pvt Ltd, a Pakistani front company affiliated with the Pakistan Energy Commission (PAEC), has supplied to North Korea two specialised nickel-alloy metals — Inconel and Monel – which are corrosion-resistant and have applications in uranium enrichment and chemical weapons production. Another questionable export is that of vacuum induction melting (VIM) furnaces used in forging uranium or plutonium metal into hemispheres for the fissile pit and is hence controlled by the Nuclear Suppliers Group (NSG) due to their utility for nuclear weapons manufacturing.

¹¹ Anders Corr, "Chinese Involvement In North Korea's Nuclear Missile Program: From Trucks To Warheads," *Forbes*, July 5, 2017, <https://www.forbes.com/sites/anderscorr/2017/07/05/chinese-involvement-in-north-koreas-nuclear-missile-program-from-warheads-to-trucks/#719bc29e6f2f>

¹² Ibid.

¹³ Bill Gertz, "North Korea's ICBM warhead," *Washington Times*, July 5, 2017, <http://m.washingtontimes.com/news/2017/jul/5/inside-the-ring-north-koreas-icbm-warhead/>

¹⁴ Douglas Frantz, Catherine Collins, "A tale of two Bhuttos," *Foreign Policy*, November 19, 2007, <http://foreignpolicy.com/2007/11/19/a-tale-of-two-bhuttos/>

These had been procured from Suntech Technologies, a Beijing-based company, which is a primary producer of these items. A complaint lodged by the International Atomic Energy Agency (IAEA) was officially received (June 2016) by the China Atomic Energy Authority (CAEA) on this matter. Galaxy Corporation's imports from other Chinese companies include thyratrons (used as triggering devices in nuclear weapons) and radiation monitors with the end-user certificate being shown as PAEC. These items are an integral part of the hydrogen bomb test conducted by Pyongyang on September 3, 2017.¹⁵

Further, two North Korean diplomats, Kim Yong Choi and Jang Yong Son, posted in the North Korean Embassy in Tehran till 2016, and affiliated to Korea Mining Development Trading Corporation (KOMID) — a UN Security Council-designated North Korean weapons trading firm – were frequent visitors to Pakistan between 2012 and 2015. They met with Pakistani officers involved in the country's nuclear programme.¹⁶

According to international observers, the North Korea-Pakistan nexus is being sustained by transportation networks, using cargo ships in the ports of Dalian in China, Wonsan in North Korea and Qasim in Pakistan. Indian intelligence also has satellite imagery to show that the Karakoram Highway has been used to supply illicit nuclear material and dual-use items for missiles.

This brings us to India's threat perceptions regarding Pakistan's nuclear capability. Recently, Pakistan's Prime Minister Shahid Khaqan Abbasi claimed that his country has short-range nuclear weapons to counter the 'Cold Start' doctrine 'adopted' by the Indian Army. This would indicate that Rawalpindi has successfully miniaturized nuclear warheads. This needs to be assessed in tandem with Kim Jong-Un's claims that North Korea has miniaturized nuclear warheads, and also has adequate knowledge of programming and controlling thermonuclear/hydrogen fission bombs. This is a matter for serious disquiet, given Pakistan's long-standing nuclear and missile-related trade with North Korea.

Should Pyongyang be Worried?

North Korea has learnt to weather multilateral UNSC as well as unilateral US sanctions. President Trump has come out with a new set of sanctions with the

¹⁵ Stephen Blancke, "Examining allegations that Pakistan diverted Chinese-origin goods to the DPRK," *Proliferation Case Study Series*, August 2, 2016, <http://projectalpha.eu/wp-content/uploads/sites/21/2016/11/20160803 - DPRK Pak allegation case study - Project Alpha.pdf>

¹⁶ United Nations Security Council, "Report of the Panel of Experts established pursuant to resolution 1874 (2009)," February 24, 2016, http://www.securitycouncilreport.org/atf/cf/%7B65BFCF9B-6D27-4E9C-8CD3-CF6E4FF96FF9%7D/s_2016_157.pdf

objective of denying access to the US financial system to any country that trades with or finances trade with North Korea. China has promised both at the UN Security Council and General Assembly to give effect to the sanctions against North Korea. Beijing claims to have stopped the import of textiles and condensate hydrocarbons — measures which can pinch but certainly not cause the collapse of the Kim regime. Beijing has not as yet made any significant attempts to rein in Pyongyang, which would necessitate a clampdown on several Chinese nationals and entities engendering illicit trade.

China's links with North Korea go beyond the standard parameters of global commerce. The most apposite illustration in this regard is the case of Dandong Hongxiang Industrial Development Co (DHID), which became a front for the Korea Kwangson Banking Corp, a North Korean financial institution sanctioned in 2009 for its role in financing North Korea's weapons proliferation. DHID used layers of obfuscation with a complex network of front companies based in the British Virgin Islands, the Seychelles, England, Wales and Hong Kong, apart from mainland China, to establish an intricate shipping network involving over 147 ships, 167 individuals, and 248 corporate entities.¹⁷

To give an example, the ship, MV Light (IMO: 8415433) was formerly owned by a DHID subsidiary, Korea Buyon Shipping, a North Korea-based entity which had been designated under Executive Order 13722 by the US Department of the Treasury on March 16, 2016. The ship changed its name to Victory 3 after UNSC sanctions, though its IMO number remains the same. The USS McCampbell intercepted MV Light, moving from North Korea to Myanmar carrying missile components for alleged re-export to Pakistan. A Chinese company, Dalian Sea Glory Shipping, owned the above ship and, according to the UN Panel of Experts' report of March 2016, the company's directors were Chinese nationals Lu Tiehe, Fan Mintian and Dong Changqing. These individuals owned several shipping companies, including V Star Company based in Hong Kong. This company owned another ship 'Chong Chon Gang', which was seized in 2015 for smuggling weapons for a North Korean company, Ocean Maritime Management (OMM). Lu Tiehe is the sole shareholder and director of the Hong Kong-based company Sea Star Ship Co Ltd, which owns the ship Baoshan Rich (IMO: 9128843), which has been involved in smuggling weapons, and had come to adverse notice for sailing from Dalian (PRC) to DPRK to Iraq and UAE¹⁸ with weapons for Syria and Iraq.

¹⁷ Bill Powell, "Will Trump Stop the 10 Chinese Companies Supplying North Korea's Nuclear Program?," *Newsweek*, July 13, 2017, <http://www.newsweek.com/2017/07/21/trump-stop-chinese-companies-supplying-north-koreas-nuclear-weapons-635538.html>

¹⁸ *In China's Shadow: Exposing North Korean Overseas Networks* (The Asian Institute of Policy Studies, C4ADS, August 2016), <https://static1.squarespace.com/static/566ef8b4d8af107232d5358a/t/57dfe74acd0f68d629357306/1474291539480/In+China%27s+Shadow.pdf>

The DHID came under the purview of US sanctions in October 2016, but its role has been seamlessly taken over by its subsidiary, the Liaoning Hongxiang trading conglomerate, which is headed by Chinese national Ma Xiaohong. This conglomerate is North Korea's largest trading partner and claims to be a bridge between North Korea and the world. The conglomerate works out of Dandong, a small city in the north eastern province of Liaoning, and has a number of verticals, including trading houses, shipping lines, currency exchanges, etc.¹⁹ It is, however, yet to come under US sanctions. Unsurprisingly, the Liaoning Hongxiang Group inaugurated the newest China-North Korea shipping route, from Longkou to Nampo, in late September 2015. This route has seen significant traffic despite existing international sanctions against North Korea.

The Liaoning Haongxiang Group also has significant connections with Myanmar. The conglomerate's vice president is a Myanmar business tycoon TayZa, who has been designated by the US Treasury Department as "an arms and narcotics dealer".²⁰ He has extensive interests around Myanmar, especially in the areas of aviation, military equipment, and fuel. He also owns a football club, one of Myanmar's largest banks, and a company responsible for cargo clearing in the country's international airports. He is reported to have been instrumental in organizing nuclear contracts with Russia and North Korea.

Given the above backdrop, North Korea is expected to be able to withstand the sanctions, as help from China and Chinese conglomerates is unlikely to be shut down. North Korea has been and will be a strategic asset for China. The Chinese leadership has traditionally felt that a unified Korea with American troops in the Korean peninsula, close to the Chinese border, is a major security concern. The US, on its part, cannot afford to take an excessively belligerent stance with China, which could affect its US \$ 650 billion trade with the country, notwithstanding Trump's claim that "all options are on the table".²¹

During a recent trip to China, Secretary of State Rex Tillerson claimed that Washington had "direct channels of communication" with North Korea, and was exploring the possibilities of a dialogue with Pyongyang. Despite Tillerson's differences with Trump over dialogue with North Korea, it is likely that back channels have been activated.²² This would not be a surprising development as North Korea has demonstrated that it has in its arsenal nuclear-capable ICBMs. Hence, Washington, despite sending B-1B long range bombers and F-15 jets close to North

¹⁹ David Thompson, "Risky Business: A System-Level Analysis of the North Korean Proliferation Financing System," <https://c4ads.org/risky-business/>

²⁰ <https://www.forbes.com/sites/forbesasia/2014/07/23/burmese-tycoon-tay-za.../2/>

²¹ <http://www.defenseone.com/threats/2017/04/what-are-americas-options-north-korea/136827/>

²² "Jim Mattis plays down split between Trump, Tillerson on North Korea," *Japan Times*, October 4, 2017, <https://www.japantimes.co.jp/news/2017/10/04/asia-pacific/mattis-plays-split-trump-tillerson-north-korea/#.Wddvs2iCzIU>

Korea's east coast, is unlikely to up the ante by initiating actual hostilities, given Pyongyang's demonstrated nuclear prowess.

On his part, Ri Yong-ho, North Korea's Foreign Minister, sounded suitably bellicose about US threats. Although he warned that US jets could be shot down, no action was taken when they actually overflew North Korean airspace.²³ There is an uneasy equilibrium, which indicates that negotiations with Beijing over myriad issues are underway, including possibly the issue of the presence of theatre high altitude area defence (THAAD) missiles in South Korea. The burgeoning US-China rivalry will ensure that the current standoff in the Korean peninsula will not be resolved anytime soon. Kim Jong-Un will continue to exploit the current situation in the region to consolidate his regime's political power.

While India is a bystander on this issue, it needs to be on the alert. Pakistan's links with North Korea are evident, and nuclear shadow boxing by Islamabad is only to be expected. The potential and overwhelming danger it presents cannot be underestimated. Continued caution to prevent any adventurist attempt by the Pakistan military needs to be at the top of India's agenda.

²³ Jared Ferrie, "Burmese Tycoon Tay Za Under Scrutiny," *Forbes*, July 23, 2014, <https://www.forbes.com/sites/forbesasia/2014/07/23/burmese-tycoon-tay-za-under-scrutiny/#5569fafd6a7a>

About the Authors

Prabha Rao is a Senior Fellow at the Institute for Defence Studies & Analyses, New Delhi.

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