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The North Korean Bomb

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We now have the eighth declared nuclear weapons state: the Democratic Peoples Republic of Korea (DPRK). Here is an investigation into what DPRK has, where it has come from, and what next.

In early October 2002, James Kelley, Assistant Secretary of State, informed North Korean officials that the United States was aware North Korea has a program to enrich Uranium for potential use in nuclear weapons. For a while the North Koreans denied this, but later confirmed American suspicions. That Pyongyang has been able to keep its nuclear weapons program secret for so long is no real surprise, since it is one of the world's most recluse countries with a massive, almost Orwellian, capability for controlling information. Now, for the first time, North Korea has formally admitted that it has a nuclear program and "more powerful" weapons, as well. Additionally, North Korea says it has continued work on its nuclear bomb despite a 1994 agreement with the United States that was supposed to see all such efforts come to an end.

The Agreed Framework signed by the United States and North Korea on 21 October 1994 in Geneva agreed that: North Korea would freeze its existing nuclear program and agree to enhanced International Atomic Energy Agency (IAEA) safeguards; Both sides would cooperate to replace the DPRK's graphite-moderated reactors for related facilities with light-water (LWR) power plants; Both countries would move towards full normalization of political and economic relations; Both sides will work together for peace and security on a nuclear-free Korean peninsula; and Both sides would work to strengthen the international nuclear non-proliferation regime.

Korea's Nuclear Assets ? A Factfile

Prior to the establishment of the Agreed Framework, intelligence sources believed that North Korea could have extracted plutonium from their reactors for use in nuclear weapons ? perhaps enough for one or two nuclear weapons. Back in 1992 American intelligence analysts also believed that North Korea had enough nuclear weapon material for six to eight atomic bombs. US intelligence analysts, who had watched a small reactor operate for four years at Yongbyon, 60 miles north of Pyongyang, said that the reactor has produced about two bombs' worth of plutonium.

In 1956, the DPRK and the Soviet Union signed two agreements on cooperation on nuclear research projects. DPRK scientists began to receive training at the Soviet Dubna Nuclear Research Complex. A nuclear research center was also constructed near Yongbyon as a part of these agreements. In August 1965, the Soviet Union delivered a 0.1 megawatt thermal (MWt) critical assembly and a two MWt research reactor ("issledovatelskii reaktor tipa 2000," i.e. IRT 2000) to the DPRK. From 1965 through 1973 fuel elements enriched to 10 percent uranium was supplied to the DPRK for this reactor. In the 1970s the focus was mainly on establishing the nuclear fuel cycle, including refining, conversion and fabrication. In September 1974, the DPRK officially joined the International Atomic Energy Agency (IAEA), although it had not acceded to the nuclear Non-Proliferation Treaty (NPT). In 1984, the DPRK began construction of a 50 MWt power reactor (G-2 gas-graphite type) located south of Yongbyon. This was scheduled to be completed in 1995. In January 1986, a five MWt indigenous experimental nuclear power reactor was commissioned by the Institute of Nuclear Physics in

Yongbyon (gas-graphite design of the 1940s, Calder Hall-type). And in 1987, the DPRK began the construction of a "radio-chemical laboratory" that was designed for research on the separation of uranium and plutonium, waste management, and the training of technicians. This was scheduled to be operational in 1994. Other North Korean nuclear facilities include: one 200 MWt power reactor being built in Taejong, three proposed power reactors (635 MWt each) for a nuclear power plant being planned in Sinp'o, a uranium mining facility designed to dress and smelt uranium ore located in a hill just north of P'yongsan, a uranium purification plant in Kusong, low-level uranium enrichment facilities in Pakch'on, nuclear research facilities in P'yongson, Ch'ongjin, Pakch'on, Hamhung, Kimch'aek, and a subcritical facility at Kim Il-sung University in Pyongyang.1

The Federation of American Scientists (FAS) writes that in 1974 Korean specialists independently modernized a Soviet IRT-2M research reactor in the same way that other reactors operating in the USSR and other countries had been modernized, bringing its capacity up to 8 megawatts and switching to fuel enriched to 80 percent. Subsequently, the degree of fuel enrichment was reduced. In the same period the DPRK began to build a 5 MWt research reactor, which is called the "second reactor." In 1977 the DPRK concluded an agreement with the International Atomic Energy Agency [IAEA], allowing the latter to inspect a research reactor which was built with the assistance of the USSR although it did not sign the NPT then. It eventually signed the NPT in 1985. 2

> DPRK has just demonstrated that it cannot be trusted to fulfil its obligations, so it makes no diplomatic sense for the west to offer more political or economic inducements.

In January 1992, under enormous pressure from the international community, particularly from the Soviet Union, the DPRK finally agreed to sign a nuclear safeguards agreement (INFCIRC/403) with the IAEA. The first international inspection team arrived in Yongbyon in May 1992. A series of nuclear inspections took place. Every time international inspectors went there (six times in a row), they found additional evidence of the DPRK's noncompliance with its NPT obligations.3 No matter how earnestly the North Korean scientists tried to prove that they were in compliance with international norms and sincere about their lack of knowledge and understanding of certain technological processes, they were greeted with profound suspicion and accusations of past and present misdeeds.4 This led to a confrontation between the DPRK and the IAEA over the issue of conducting special inspections, and resulted in DPRK's decision to withdraw from the NPT in March 1993. This standoff quickly drew the US into the peninsula once again and led to the 1994 agreement after hectic bargaining. In the agreed framework, both sides agreed to take carefully orchestrated steps that would result in dismantling of DPRK's proliferation-prone fuel cycle, based on graphite-moderated reactors.5 In return the DPRK would receive modern light-water reactors, compensation for lost energy in the form of heavy oil, and US diplomatic recognition.6

Pakistan: The Silent Partner

The New York Times has recently reported that Pakistan assisted the DPRK nuclear weapons program. The military and political relationship between Pakistan and DPRK goes back to the early 1970s. After the dismemberment of Pakistan and in its quest for security Pakistan established formal diplomatic relations with the DPRK. This was to reciprocate the military assistance that DPRK provided during September-December 1971. 7 This military assistance continued through the seventies with DPRK providing artillery ammunition, multiple rocket launchers and spares. The July 1977 coup by Zia-ul-Haq, however, saw military co-operation being allowed to lapse.

In the eighties, the Iran-Iraq war became the reason for renewed Pakistan-DPRK missile cooperation. Both Pakistan and DPRK provided military and political assistance to Iran. The DPRK provided Iran 160 Scud B (known as Hwasong 5 in DPRK) missiles as well as other components. "It was during the war that the first known ballistic missile contacts between Pakistan and DPRK occurred as engineers and advisors from both countries worked on Iran's missile program."8 Examples of this cooperation include: the DPRK sale of milling and drilling equipment to Pakistan; cooperative

covert programs to acquire nuclear and missile technologies from Germany; and, Pakistani provision of nuclear technology to the DPRK.9

With Benazir Bhutto coming to power in 1988, official support for the Sino-Pak missile and nuclear co-operation, and Pak-DPRK missile cooperation was renewed. This led to a visit by Pakistani officials to the Sanum-dong missile development centre to examine the No-dong.10 Indian intelligence analysts believe that the Pakistan-DPRK trade had its origins in early 1990s, with AQ Khan visiting North Korea 13 times during 1992-94. By the late 1990s, Pakistan had begun supplying gas centrifuges and other nuclear technology. In August 1992, DPRK Deputy Premier-Foreign Minister Kim Yong-Nam travelled to Syria, Iran and Pakistan to discuss areas of mutual interest and co-operation. The Ghauri program is believed to have started in late 1993 or early 1994. In December 1994 Benazir Bhutto travelled to China and DPRK, but publicly denied seeking cooperation for missile development.

With increasing US pressure on China, Pakistan was looking for alternate sources of missile cooperation. "The DPRK would serve as a conduit for a portion of PRC assistance and provide hardware and components from its No-dong and Taep-o-dong programs."11 In April 1994 a delegation of the DPRK Foreign Ministry headed by Pak Chung-kuk, deputy to the Supreme People's Assembly travelled to Iran and Pakistan.12 In November 1995, a DPRK military delegation led by Choe Kwang, Vice Chairman of the National Defence Commission, and Minister of the People's Armed Forces travelled to Pakistan. This delegation had meetings with Pakistan's President Sardar Leghari, Defence Minister Aftab Shaban Mirani, Chairman Joint Chiefs of Staff and various other defence personnel. Choe is believed to have visited the missile related production facility in Faisalabad and Jhelum (the area from where Ghauri was subsequently launched.)13 Choe is believed to have finalised deals to provide Pakistan either with major components or a modified No-dong missile.14

On 25 June 1999, Indian customs officials detained a North Korean freighter allegedly bound for Malta. The ship, Ku Wol-San, was carrying precision machine tools used in missile production. According to Indian sources, the machinery was intended for the construction of a missile production facility at Fatehjung in Pakistan.15 The ship declared that after off-loading 13,000 metric tons of sugar at Kandla, India, it was scheduled to carry 177 tons of machinery to Malta. However, the actual cargo included:16

- Heavy duty press and lathe for flattening and milling sheets of metal.
- Heavy plate bending machine capable of shaping 16mm thick sheets of metal into 700mm diameter rocket motor casings. The bending machine can also be used to manufacture rocket nozzle cones and body structures.
- "Torroidal" air bottles used for guidance corrections once the warhead has separated from the missile.
- Two sets of "theodolides" ? devices used to align a missile with its launch pad.
- Sensitive electronic weighing machines and soldering devices.
- 1.5 mm-thick forged steel bars common in missile construction.
- Water purification machinery used to produce water capable of washing missile cones.

That the disclosure of the DPRK nuclear program is a challenge to the NPT, the 1994 Agreement, and to the recently released Bush Doctrine would be an understatement. There is growing concern that Pakistan is supplying nuclear weapons technology to North Korea in exchange for missile technology.17 This belief has been strengthened by a recent New York Times report. Lacking the necessary financial resources, it is feared that Pakistan is trading nuclear weapons material and technology for missile technology with North Korea.

What is likely to be the response of the non-proliferation community? One of the alternatives, a military option, a surgical strike, would be a very risky operation with Seoul being within artillery firing distance from DPRK, besides a well-equipped army at Kim Jong Il's disposal. The other alternative is to give into this nuclear blackmail and negotiate a price for DPRK not weaponizing and deploying its nuclear capabilities. But DPRK has just demonstrated that it cannot be trusted to

fulfil its obligations, so it makes no diplomatic sense for the west to offer more political or economic inducements. What remains to be seen is how the West, especially the US, will send the message that it is serious about pursuing its non-proliferation goals.

Notes:

1. Alexandre Y. Mansourov, "The Origins, Evolution, and Current Politics of the North Korean Nu-clear Program," The Non-Proliferation Review, Spring-Summer 1995, Vol 2, No 3. pp. 25-38.
2. See http://www.fas.org, accessed on 20 October 2002.
3. IAEA Press Release, "The Board of Governors' Report on the Implementation of the Agreement between the Agency and the DPRK for the Application of Safeguards in connection with the Treaty on the Non-Proliferation of Nuclear Weapons," PR 93/5 25 February 1993. Cited in Alexandre Y. Mansourov, "The Origins, Evolution and Current Politics of the North Korean Nuclear Program," The Non-Proliferation Review, Spring-Summer 1995, Vol 2, No 3.
4. Sometime between 1989 and 1991, the DPRK shut down its 5 MWt experimental power reactor three times, extracted and, possibly reprocessed, some plutonium without the IAEA inspectors be-ing present. According to the DPRK initial accounting report submitted to the IAEA in 1992, the reactor was shut down for "technical reasons" in order to "remove damaged fuel rods". See The New York Times, 7 May 1992, cited in Alexandre Y. Mansourov, "The Origins, Evolution and Current Politics of the North Korean Nuclear Program," The Non-Proliferation Review, Spring-Summer 1995, Vol 2, No 3. pp. 25-38.
5. Matthias Dembinski, "North Korea, IAEA Special Inspections, and the Future of the Nonprolifera-tion Regime," The Non Proliferation Review, Winter 1995, Vol 2, No 2. pp. 25-38.
6. Ibid.
7. Benjamin Welles, "Pakistan said to have received North Korean Arms", The New York Times, 15 October 1971.
8. Joseph S. Bermudez Jr. "DPRK-Pakistan Ghauri Missile Co-operation," Paper available at http://www.fas.org/news/Pakistan/1998/05/ghauri2.htm, accessed on 12 May 2000.
9. Gary Milhollin, "Asia's Nuclear Nightmare: The German connection," The Washington Post, 10 June 1990
10. Joseph S. Bermudaz, op. cit.
11. Ibid.
12. "Foreign Ministry Group leaves for Iran, Pakistan," Korea Central News Agency (KCNA), 31 March 1994 as cited in FBIS-94-063, 1 April 1994, p.13.
13. "Choe-Kwang-Led Delegation Arrives in Pakistan," Pyongyang Korean Central Broadcasting Net-work, 20 November 1995, as cited in FBIS-EAS-95-224, and "Military Delegation Leaves for Paki-stan" Pyongyang Korean Central Television Network, 19 November 1995, as cited in FBIS-EAS-95- 223.
14. Joseph S Bermudez Jr. op. cit.
15. Shishir Gupta, "India Detains Ship Carrying Tools for Missile Production", Hindustan Times, 4 July 1999.
16. From the online database of the Centre for Non-Proliferation Studies, available at http://www.cns.miis.edu, citing the Hindustan Times, The Hindu , The Indian Express, South China Morning Post and Korea Times (Seoul). 1
17. C. Raja Mohan, "Pak. Nuclear Exports to N. Korea?" The Hindu, 11 July 1999.

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