



NUCLEAR AGE PEACE FOUNDATION

*Committed to a World Free of Nuclear Weapons*

## **North Korea's Nuclear Program**

By Volha Charnysh, NAPF Intern

September 3, 2009

### **Background**

Liberated from Japan in 1945, Korea was divided into two occupation zones, with the Soviet Union administering the northern half and the United States administering the area south of the 38<sup>th</sup> parallel. The division was meant to be temporary, but by 1948 the politics of the Cold War resulted in the establishment of two separate nations with diametrically opposed political, economic, and social systems – the Republic of Korea (ROK) in the South and the Democratic People's Republic of Korea (DPRK) in the North. On June 25, 1950 North Korea invaded the South and soon full-scale warfare erupted. The United Nations intervened on behalf of South Korea with the United States take the lead, under Security Council resolution 82. China stepped in on behalf of North Korea. Hostilities continued until an armistice agreement was signed on July 27, 1953.<sup>1</sup> Since 1953 the relations between the two Koreas have remained strained and a UN command is still present on the Korean Peninsula today, almost 50 years after the Korean armistice.

The DPRK developed a centralized government system under the control of the communist Korean Workers' Party (KWP). Kim Il-sung ruled North Korea from 1948 until 1994. Following his death in 1994, his son – Kim Jong-il – inherited supreme power, although the President of the Presidium of the Supreme People's Assembly, Kim Yong-nam, serves as the nominal head of state. There are currently speculations about Kim Jong-il's successor, and his youngest son, Kim Jong-un, is expected to be chosen to inherit his father's police state.<sup>2</sup>

It was only in 1991 that the Cold War tensions diminished, and both the Republic of Korea and the Democratic People's Republic of Korea were simultaneously admitted to the United Nations. The attempts to reunify the Korean Peninsula over the past four decades came to a halt because of rising tensions over North Korea's nuclear program.

The DPRK nuclear research program originated in the 1950s, when the country entered into nuclear cooperation agreements with the Soviet Union and China. Under the cooperation agreement concluded between the USSR and the DPRK, a Soviet IRT-2M research reactor was assembled for the emerging nuclear center at Yongbyon in 1965 and for almost ten years 10-percent enriched fuel was supplied to the DPRK for this reactor.

In 1974, the DPRK specialists modernized Soviet IRT-2M research reactor, increasing its capacity and switching to higher enriched fuel, and started building a second reactor.<sup>3</sup> In 1977 the DPRK concluded an agreement with the International Atomic Energy Agency (IAEA), opening its first reactor to inspections. In the 1980s, North Korea began to operate facilities for uranium fabrication and conversion, built a nuclear reactor and nuclear reprocessing facilities in Taechon and Yongbyon, respectively, and conducted high-explosive detonation tests.

Upon building a nuclear reactor fueled with natural uranium, the country was urged to accede to the nuclear Non-Proliferation Treaty (NPT). The DPRK finally joined the treaty in 1985.<sup>4</sup> However, it failed to sign the IAEA safeguards agreement, which permits inspections of all plants using fissile materials, within the 18-month limit stipulated by the NPT. North Korea did not enter into an NPT safeguards agreement with the IAEA until 1992, after South Korea announced that no US nuclear weapons existed on its territory.<sup>5</sup>

Even after a nuclear fuel reprocessing facility appeared at Yongbyon (1989), no alarms sounded because in 1991 the DPRK joined the United Nations (UN) and entered into a denuclearization agreement with South Korea. The agreement prohibited testing, manufacturing, producing, receiving, possessing, storing, deploying, or using nuclear weapons, and operating uranium enrichment or plutonium reprocessing facilities on the Korean peninsula. Inter-Korean inspection was to be organized and a North-South Joint Nuclear Control Commission (JNCC) was mandated with verification of the sides' conformance to the agreement. However, the agreement is still not in effect because negotiations on its implementation and verification stalled.

Tensions reemerged when the IAEA inspections uncovered troublesome information on the North's programs in July 1992. The analysis of the plutonium samples and test results from the North Korean hot cells suggested that the DPRK must have reprocessed on at least three separate occasions in 1989, 1990 and 1991, according to the IAEA.<sup>6</sup> The DPRK denied the allegations.

From then on, a one-step-forward and one-step backward dance became a continued pattern of action between the international community and North Korea. In January 1993, the DPRK refused IAEA access to its two suspected nuclear waste sites. In March 1993, it announced the intent to withdraw from the NPT. The United Nations Security Council (UNSC) passed a resolution in May 1993 calling on North Korea to fully comply with its international nonproliferation obligations and asked all countries to facilitate this solution.<sup>7</sup> The IAEA also intensified its efforts.

Direct talks between the United States and the DPRK during the next two years resulted in a series of agreements on nuclear matters, including the 1994 Agreed Framework. The Korean Energy Development Organization (KEDO) was created in 1994 to coordinate and fund the reactor projects and energy assistance. Over 100 meetings were held with North Korea in the 10 years of its operations.<sup>8</sup> In February 1994, North Korea and the IAEA finalized their agreement to allow the IAEA inspections of North Korea's seven declared facilities. However, when the IAEA inspectors arrived, they were not allowed to inspect the plutonium reprocessing plant as had been agreed. North Korea continued to defy the international community. In June 1994, the country announced its withdrawal from the IAEA. In the next five years the North would issue invitations to the IAEA for safeguards inspections, and then refuse to comply with inspection requirements.

In 2002, the Agreed Framework broke down. North Korea was discovered to be pursuing a uranium enrichment program for military purposes. In April 2002, the DPRK for the first time announced it had a nuclear weapons program. In December 2002, the country asked the IAEA to remove its seals on its frozen facilities and then ordered the IAEA out of the country.<sup>9</sup> In January 2003, the DPRK withdrew from the NPT. In October 2003, North Korea announced that it had completed reprocessing 8,000 spent nuclear fuel rods and was using plutonium to make atomic bombs; the country's officials denied intentions to transfer any elements of their nuclear weapons program to other countries.<sup>10</sup>

Little progress appears to have been made in the ensuing Six-Party talks. In February 2005, North Korea declared it had manufactured a nuclear weapon. Thus, it appears that it was when the DPRK was not engaged in talks with the other five parties (2003-2005) that it was able to push forward with the weapons program. In July 2005, North Korea tested its missiles, angering the international community. On October 9, 2006, Pyongyang made a statement by testing one of its nuclear weapons with a yield of less than 1 kiloton – much less than the design yield, according to the seismologists.<sup>11</sup> While the test did not succeed as planned, it proved that the DPRK was determined to become a nuclear weapons state.

In response, the UNSC unanimously voted to increase sanctions on North Korea, but to no avail. On April 5, 2009, North Korea launched the three-stage Unha-2 rocket. As the UNSC condemned the rocket launch, calling for strengthening the punitive measures under Resolution 1718, Pyongyang withdrew from the six-party talks and said it would no longer be bound by any of its agreements.

North Korea conducted its second underground nuclear test on May 25, 2009, as promised in its April 28, 2009 statement. This test was more successful, and the DPRK announced that “the results of the test helped satisfactorily settle the scientific and technological problems arising in furthering increasing the power of nuclear weapons and steadily developing nuclear technology.”<sup>12</sup> The UNSC convened an emergency meeting and condemned the test as a violation of UNSC resolution 1718. On the next day, South Korea announced participation in the Proliferation Security Initiative. The DPRK denounced this as an act of war and scrapped the 1953 Armistice Agreement, warning of a possible attack on the South.<sup>13</sup> On June 12, the UNSC unanimously passed Resolution 1874, sharpening its weapons import-export ban on the DPRK enacted in resolution 1718 (2006) by calling on states “to inspect, seize and dispose of the items and by denying fuel or supplies to service the vessels carrying them.”<sup>14</sup>

## **Timeline**

**December 12, 1985:** The DPRK signs the NPT, but does not complete a safeguards agreement with the IAEA.

**1989:** A nuclear fuel reprocessing facility appears at Yongbyon nuclear site.

**1991:** The DPRK joins the UN and enters into a denuclearization agreement with South Korea.

**January 1992:** North Korea signs a safeguards agreement with the IAEA.

**1993:** The IAEA requests a special inspection at Yongbyon processing plant, but the DPRK announces that it would withdraw from the NPT rather than endure the IAEA inspections.

**May 1993:** UNSC passes a resolution calling on the DPRK to fully comply with its nonproliferation obligations and asks all countries to facilitate this solution.<sup>15</sup>

**June 1993:** The DPRK suspends its NPT withdrawal and agrees to application of the IAEA safeguards.<sup>16</sup>

**May 1994:** The IAEA confirms that the DPRK began to remove spent fuel from its research reactor.

**June 1994:** The DPRK announces withdrawal from the IAEA.

**October 21, 1994:** The United States and the DPRK sign the Agreed Framework. Pyongyang is required to freeze the nuclear reactors suspected of being part of a nuclear weapons program in exchange for two proliferation-resistant reactors. KEDO is formed to implement the agreement.<sup>17</sup>

**1994 – 2000:** The DPRK issues invitations to the IAEA and then refuses to comply.

**April 2002:** The DPRK for the first time announces that it pursues a nuclear weapons program.

**December 2002:** The DPRK asks the IAEA to remove seals on the frozen facilities and then orders the IAEA out the country.<sup>18</sup>

**January 2003:** The DPRK withdraws from the NPT.

**February 2005:** The DPRK declares that it has manufactured nuclear weapons.

**July 2006:** The DPRK tests its missiles. The UNSC unanimously condemns the tests.

**October 9, 2006:** The DPRK tests one of its nuclear weapons.

**October 14, 2006:** The UNSC unanimously votes to increase sanctions on the DPRK.

**March 13-14, 2007:** Director-General of the IAEA, Mohamed ElBaradei, visits the DPRK.

**July 16, 2007:** The IAEA confirms the shutdown of the Yongbyon plutonium nuclear facilities.

**June 26, 2008:** The DPRK delivers a declaration of its nuclear programs to China, the six-party talks chair. The declaration reportedly indicates that North Korea separated a total of about 30 kilograms of plutonium and used about 2 kilograms for its nuclear test in 2006.

**August 2008:** North Korean leader Kim Jong-il reportedly suffers a stroke.

**December 2008:** The United States completes the final shipment of its 200,000 tons of heavy fuel oil pledged to the DPRK bringing the total energy assistance to about 550,000 tons.

**April 5, 2009:** The DPRK launches the three-stage Unha-2 rocket.

**April 2009:** The UNSC condemns the rocket launch, calling for strengthening the punitive measures under Resolution 1718. The DPRK declares withdrawal from the six-party talks and rejects all of the agreements previously concluded. The DPRK expels the IAEA and US monitors from the Yongbyon nuclear complex.

**May 25, 2009:** The DPRK conducts its second underground nuclear test.

## **Current Issues**

In 2009, the second nuclear test and multiple missile launches have increased the price of North Korea's return to the negotiating table. If left unchecked, the DPRK will separate more plutonium and conduct more nuclear tests. The impoverished state may resume selling nuclear technology and its fissile material to third parties, and well-tested warheads will be in much higher demand. Evidence suggests that North Korea has attempted to transfer nuclear weapons technologies to Iran and Syria, and strong concerns exist about the nature of DPRK's relationship with Burma.

The North Korean leader is currently looking for a successor, which may affect the country's behavior in unpredictable ways. Another concern is the possibility that DPRK's neighbors, Japan and South Korea, will rethink their nuclear postures and consider obtaining independent nuclear weapons systems. Finally, there is also a high risk of a military clash on the peninsula as North Korea announced that it would no longer abide by the truce that ended the Korean War in 1953 and recently accused South Korea of making a "declaration of war." As a result, the American and South Korean troops along North Korea's border are currently on high alert.

## **Recommendations**

*Understand the problem in the light of North Korea's internal vulnerability.*

Understanding North Korea is important for choosing the right course of action. The country may be building the dangerous weapons to gain US attention, or it may be seeking to establish an independent deterrent and be recognized as a nuclear weapons state. In the former case, a generous aid package and security guarantees might convince the DPRK to roll back the program. In the latter case, only crippling economic sanctions and military threats will make the DPRK give up its nuclear ambitions. What complicates the situation further is the country's internal vulnerability, which seems to have affected the timing of the second nuclear test and North Korea's subsequent aggressive posturing. Thus, the main task before the international community is to ensure that North Korea is punished for defying the international regime without sabotaging the success of a potential diplomatic effort and to break the pattern of defiance, in which negotiations had only given the regime more time to enhance its nuclear capabilities.

*Strengthen the Global Nonproliferation Regime.*

A first group of steps to be taken are general measures to strengthen the global nonproliferation regime, namely, the long-due entry into force of the Comprehensive Test Ban Treaty (CTBT) and negotiation of a global fissile material production cutoff. The performance of the CTBT's International Monitoring System (IMS) and increased publicity for the organization may help create positive political momentum for the CTBT ratification.<sup>19</sup>

A second group of steps target North Korea directly. Considering its poor nuclear track record, North Korea's nuclear capabilities remain weak.<sup>20</sup> However, the DPRK seems to be determined to develop a nuclear arsenal and win recognition as a nuclear weapons state.<sup>21</sup>

*Look for Diplomatic Solutions outside the Six-Party talks.*

North Korea has yet again agreed to talk, but insists on communicating with the United States directly and renounces the Six-Party Talks. The US administration, on the other hand, has made bilateral talks contingent on North Korea's concurrent return to table with the five other negotiating parties.<sup>22</sup> It is time to look for diplomatic solutions outside of the Six-Party framework, conceding to both official and non-official direct talks, if necessary. Taking into consideration current vulnerability of North Korea, it is important to assure the DPRK that as long as no new violations of the nonproliferation regime occur, the transition of power from Kim Jong-il will suffer no interferences, as Paul B. Stares, director of the Center for Preventive Action at CFR, recommends.<sup>23</sup>

*Expand the scope of sanctions without aggravating the suffering of the population*

However, diplomatic efforts must be combined with other measures. So far, the sanctions imposed on the regime have been half-hearted. To punish the DPRK for its defiance, a new Security Council resolution "with teeth" is necessary. Because North Korea's nuclear abilities remain not fully reliable, they can still be successfully contained by means of financial restrictions and tightened arms embargoes on critical items and technologies. China is especially capable of exerting political and economic pressure on the DPRK as trade with Beijing accounts for 73 percent of North Korea's international trade. An important consideration here is expanding the scope of sanctions without aggravating the suffering of the North Korean population.

*Prevent North Korea from transferring critical materials and technologies to others (Resolution 1874).*

An even larger priority is to prevent North Korea from transferring critical materials and technologies to others. The latest mandates contained in Resolution 1874 and the declared mission of the Proliferation Security Initiative (PSI) can serve to this end only if China and many others can be persuaded to join the PSI. Better international cooperation within various frameworks provides for better and timely intelligence sharing and allows efficient policy coordination, which could reduce the likelihood of nuclear technologies spreading from North Korea to other nuclear aspirants.

The Security Council must provide the UN member states with the means of enforcing the new restrictions. For example, Resolution 1874 allows inspecting North Korean ships on the high seas only with North Korean consent. If North Korea denies access, a member state can direct a vessel to "an appropriate and convenient port" for inspection by local officials. If North Korea refuses to divert the ship, a report to a UN committee can be filed. However, additional paperwork will hardly succeed in halting North Korea's illegal activities. It has been overlooked that the DPRK's renunciation of 1953 armistice that ended fighting in the Korean War has opened the door for the use force against North Korea's vessels by the United States, a combatant in the conflict as the leader of the UN Command.<sup>24</sup> So far, the stern warnings issued by the United States and the UN have not been actualized.

*Normalize DPRK's relations with the outside world.*

Most important, the DPRK's moves toward irreversible nuclear disarmament should be rewarded with tangible incentives like the full normalization of relationships with the outside world,

assistance with developing non-nuclear energy sources and modernizing agriculture with Western technologies and equipment. If the gap between the isolated and technologically inferior North Korea and its better faring neighbors is bridged, a permanent peace regime on the peninsula will be easier to achieve.

---

<sup>1</sup> "The Korean War, 1950–1953," an extract from American Military History, Volume 2—revised 2005. <http://www.army.mil/cmh-pg/books/AMH-V2/AMH%20V2/chapter8.htm>. Accessed July 31, 2009.

<sup>2</sup> Peter Cassata, "Kim Jong-il's Successor Named," *Atlantic Council*, Feb. 20, 2009, [http://www.acus.org/new\\_atlanticist/kim-jong-ils-successor-named](http://www.acus.org/new_atlanticist/kim-jong-ils-successor-named). Accessed July 31, 2009.

<sup>3</sup> Paul Leventhal & Steven Dolley, "The North Korean Nuclear Crisis," *Nuclear Control Institute*, June 16, 1994, <http://www.nci.org/index.htm>. Accessed July 31, 2009.

<sup>4</sup> Ibid.

<sup>5</sup> Daniel Poneman, "The History of the 1994 Agreed Framework," Information Brief The Forum for International Policy, March 7, 2003.

<sup>6</sup> Leventhal, et. al.

<sup>7</sup> Ibid.

<sup>8</sup> Charles Kartman, Remarks at the U.S. Institute for Peace, 2004.

<sup>9</sup> Arms Control Association, "Chronology of U.S.-North Korean Nuclear and Missile Diplomacy," Fact Sheet, June 2003, <http://www.armscontrol.org/factsheets/dprkchron>. Accessed July 31, 2009.

<sup>10</sup> James Brooke, "North Korea Says It Is Using Plutonium to Make A-Bombs," *New York Times*, October 2, 2003.

<sup>11</sup> "From the seismic data alone, the source might have been an explosion of a mixture of ammonium nitrate and fuel oil, ANFO, an inexpensive explosive used in mining all over the world." Richard L. Garwin and Frank N. von Hippel, "A Technical Analysis of North Korea's Oct. 9 Nuclear Test," *Arms Control Today*, November 2006.

<sup>12</sup> Arms Control Association.

<sup>13</sup> Choe Sang-Hun, "South Korea and U.S. Raise Alert Level," *New York Times*, May 29, 2009.

<sup>14</sup> "Security Council, Acting Unanimously, Condemns In Strongest Terms Democratic People's Republic Of Korea Nuclear Test, Toughens Sanctions," United Nations, Security Council, 6141st Meeting, <http://www.un.org/News/Press/docs/2009/sc9679.doc.htm>. Accessed July 31, 2009.

<sup>15</sup> Daniel Poneman, "The History of the 1994 Agreed Framework," Information Brief The Forum for International Policy, March 7, 2003.

<sup>16</sup> U.S. Arms Control Association, Chronology of U.S.-North Korean Nuclear and Missile Diplomacy, Fact Sheet, June 2003.

<sup>17</sup> Jonathan D. Pollack, "The United States, North Korea, and the End of the Agreed Framework," *Naval War College Review* LVI, No. 3 (Summer 2003): 7.

<sup>18</sup> Arms Control Association, "Chronology of U.S.-North Korean Nuclear and Missile Diplomacy," Fact Sheet, June 2003.

<sup>19</sup> After North Korea threatened to test again in April 2009, the CTBTO's International Data Center (IDC) prepared for the possibility of test, detected the explosion when it came and alerted the international community. The CTBTO's contributions to strengthening international nuclear nonproliferation and security are now more widely appreciated. The extent to which the IMS was able to detect this test appears to have increased its credibility and exemplified the difficulty conducting nuclear test without being detected.

[http://www.nti.org/e\\_research/e3\\_north\\_korea\\_nuclear\\_test.html](http://www.nti.org/e_research/e3_north_korea_nuclear_test.html)

<sup>20</sup> Discarding tired assumptions about North Korea. By Jacques E. C. Hymans | 28 May 2009.

<http://www.thebulletin.org/web-edition/op-eds/discarding-tired-assumptions-about-north-korea>

<sup>21</sup> Victor Cha, "Up Close and Personal, Here Is What I Learned," *Washington Post*, June 14, 2009,

<http://www.washingtonpost.com/wp-dyn/content/article/2009/06/12/AR2009061202685.html>

<sup>22</sup> Choe Sang-Hun, "N. Korea Says It's Open to Dialogue," *New York Times*, July 27, 2009.

<sup>23</sup> Jayshree Bajoria and Carin Zissis, "The Six-Party Talks on North Korea's Nuclear Program," Council on Foreign Relations, July 1, 2009. <http://www.cfr.org/publication/13593/> Accessed August 11, 2009.

<sup>24</sup> Gordon G. Chang, "How to Stop North Korea's Weapons Proliferation," *The Wall Street Journal*, July 1, 2009.