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North Korea's Nuclear Weapons Program

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SUMMARY

North Korea's decisions to restart nuclear installations at Yongbyon that were shut down under the U.S.-North Korean Agreed Framework of 1994 and withdraw from the Nuclear Non-Proliferation Treaty create an acute foreign policy problem for the United States. North Korea's major motive appears to be to escalate pressure on the Bush Administration to negotiate over Pyongyang's proposed non-aggression pact and/or a new nuclear agreement that would provide new U.S. benefits to North Korea. However, re-starting the Yongbyon facilities opens up a possible North Korean intent to stage a "nuclear breakout" of its nuclear program and openly produce nuclear weapons within six months. North Korea's actions follow the reported disclosure in October 2002 that North Korea is operating a secret nuclear program based on uranium enrichment and the decision by the Korean Peninsula Energy Development Organization (KEDO) in November 2002 to suspend shipments of heavy oil to North Korea. North Korea claims that it has nuclear weapons and that it has completed reprocessing of 8,000 nuclear fuel rods. U.S. intelligence agencies are uncertain of the status of the reprocessing.

The main objective of the Bush Administration is to secure the dismantling of North Korea's plutonium and uranium-based nuclear programs. Its strategy has been: (1) terminating the Agreed Framework; (2) withholding any U.S. reciprocal measures until North Korea takes visible steps to dismantle its nuclear programs and makes concessions on other military issues; (3) assembling an international coalition to apply diplomatic and economic pressure on North Korea; and (4) planning for future economic sanctions and military interdiction against North Korea through a Proliferation Security Initiative. China, South Korea, and Russia have criticized the Bush Administration for not negotiating directly with North Korea, and they voice opposition to economic sanctions and to the use of force against Pyongyang.

The crisis is the culmination of eight years of implementation of the 1994 Agreed Framework, which provides for the shutdown of North Korea's nuclear facilities in return for the annual delivery to North Korea of 500,000 tons of heavy oil and the construction in North Korea of two light water nuclear reactors. The United States pledged to issue a nuclear security guarantee to North Korea as North Korea complied with its 1992 safeguards agreement with the International Atomic Energy Agency.

MOST RECENT DEVELOPMENTS

At the APEC summit in Bangkok on October 20, 2003, President Bush offered North Korea a written multilateral security guarantee that the United States would not attack North Korea if North Korea agreed to end its nuclear programs, but he continued to reject North Korea's proposal of a U.S.-North Korean non-aggression pact. North Korea replied that it would "consider" Bush's offer if the United States "confirmed" that it would settle the nuclear issue "on the principle of simultaneous actions." It announced on October 30, 2003, that it would participate in another six-party meeting. North Korea asserted that it invited a U.S. congressional delegation to "watch on the spot the completed reprocessing" of 8,000 nuclear fuel rods into weapons-grade plutonium. The visit of the delegation was canceled because of opposition from the Bush Administration to the visit.

BACKGROUND AND ANALYSIS

Implications of North Korea's Actions Since October 2002

The Bush Administration disclosed on October 16, 2002, that North Korea had revealed to U.S. Assistant Secretary of State James Kelly in Pyongyang on October 5, 2002, that it had a secret nuclear weapons program based on uranium enrichment. North Korea admitted the program in response to U.S. evidence presented by Kelly. The program is based on the process of uranium enrichment, in contrast to North Korea's pre-1995 nuclear program based on plutonium reprocessing. North Korea began a secret uranium enrichment program after 1995 reportedly with the assistance of Pakistan. North Korea provided Pakistan with intermediate range ballistic missiles in the late 1990s. The Central Intelligence Agency issued a statement in December 2002 that North Korea likely could produce two or more uranium-based atomic bombs after 2004. *U.S. News and World Report*, September 1, 2003, reported that the C.I.A. moved up this estimate to the second half of 2004.

In admitting to the secret program, Vice Foreign Minister Kang Sok-ju proposed a new U.S.-North Korean negotiation of a bilateral non-aggression pact and an agreement for the United States to cease "stifling" North Korea's economy. The North Korean proposal, which Pyongyang reiterated at the Beijing talks in April and August 2003, asserts that these agreements would open the way for resolving the nuclear issue. Some U.S. experts, however, believe that the non-aggression pact proposal is a "smokescreen" for North Korea's long-standing proposal (since 1974) of a U.S.-North Korean bilateral peace treaty. As stated, both proposed pacts would replace the 1953 Korean armistice, and neither would include South Korea as a participant. North Korea has long stated that a negotiation of a bilateral peace treaty would include provisions for the withdrawal of U.S. military forces from South Korea. The United States and South Korea have rejected consistently the bilateral peace agreement proposal. Some experts also believe that North Korea's demand for the cessation of U.S. "stifling" of its economy is a subterfuge for Pyongyang's demand since 1999 that the United States remove North Korea from the U.S. list of terrorist countries, thus, in effect,

making North Korea eligible for financial assistance from the World Bank, the International Monetary Fund, and the Asian Development Bank.

By their own admission, Bush Administration officials were surprised by the intensity of North Korea's moves in late December 2002 to re-start nuclear facilities at Yongbyon and expel officials of the International Atomic Energy Agency placed there under the U.S.-North Korean Agreed Framework of 1994 to monitor the shutdown. North Korea began these measures after the Korean Peninsula Energy Development Organization (KEDO) voted in November to end shipments of heavy oil to North Korea, which had been carried out under the U.S.-North Korean 1994 Agreed Framework. North Korea re-started the five megawatt nuclear reactor shut down under the Agreed Framework and resumed construction of two larger reactors that was frozen under the agreement. North Korea also announced that it would re-start the plutonium reprocessing plant that operated up to 1994, and it later asserted that it had reprocessed 8,000 nuclear fuel rods, which had been in storage since 1994, into nuclear weapons grade plutonium (but U.S. intelligence reportedly has been unable to verify the exact state of reprocessing). North Korea asserted that it possessed nuclear weapons. However, North Korea denied that it has a uranium enrichment program. It withdrew from the Nuclear Non-Proliferation Treaty (NPT) in January 2003. It justified its action by citing the U.S.-initiated cutoff of heavy oil shipments in December 2002 and by charging that the Bush Administration planned a "pre-emptive nuclear attack" on North Korea. It escalated this by accusing the Bush Administration of using the U.S. position on the nuclear issue as a mask for a U.S. Iraq-like strategy to attack North Korea.

North Korea's strategy and tactics, including its positions in the Beijing talks, appear intended to escalate pressure on the Bush Administration to negotiate over Pyongyang's proposed non-aggression pact and/or a new nuclear agreement that would provide new U.S. benefits to North Korea. Pyongyang long has emphasized "intimidation tactics" in its diplomacy; and since October 2002 it has issued other threats including a resumption of long-range missile tests and stepped-up proliferation of weapons to other countries. At the Beijing talks in April 2003, North Korea threatened to proliferate nuclear materials. In Beijing in April and August 2003, North Korea threatened to test a nuclear weapon; but it stated in October 2003 that it would not proliferate nuclear materials.

North Korea's detailed proposal at the Beijing meetings was based on restoring major elements of the 1994 Agreed Framework. It called for U.S. commitments that go beyond the Agreed Framework, including U.S. accession to a number of North Korean demands since 1994. North Korea described it as based on "the principle of simultaneous actions;" but it places key U.S. obligations in the early stages of a settlement process and defers and makes vague North Korea obligations. In a first phase, North Korea would declare that it will end its plutonium nuclear program and the United States would resume the supply of heavy oil and increase food aid. In a second phase, the United States would conclude a written, legal non-aggression treaty and provide North Korea with electricity. North Korea would respond by refreezing the Yongbyon nuclear facilities and would allow renewed IAEA monitoring of the freeze but not full-scope inspections. North Korea would "settle the missile issue" when the United States and Japan open diplomatic relations with it and Japan extends several billion dollars to North Korea. The United States would remove North Korea from the U.S. list of terrorist countries. The final step would be for North Korea to dismantle its plutonium nuclear program when the two light water reactors are completed; given the state of construction of the reactors, this would mean a gap of at least seven years between a

settlement agreement and dismantlement. North Korea's proposal referred only to its plutonium-based nuclear program; at the August 2003 Beijing meeting, it denied the existence of a uranium-based program.

However, re-starting the Yongbyon facilities opens up a possible North Korean intent or option to stage a "breakout" of its nuclear program in 2003 by openly producing nuclear weapons. The most dangerous follow-up North Korean move would be to move 8,000 stored nuclear fuel rods at Yongbyon into the plutonium reprocessing plant for the production of nuclear weapons-grade plutonium. According to estimates by nuclear experts and reportedly by U.S. intelligence agencies, if North Korea reprocesses the fuel rods, as it claimed in the Beijing talks, it would take about four months to produce weapons grade plutonium and another one or two months to produce four to six atomic bombs. Such a nuclear breakout would diminish considerably any prospect of ending North Korea's nuclear program diplomatically. Production of weapons-grade plutonium also would add substance to North Korea's threat at Beijing to export nuclear materials. U.S. and South Korean officials estimated in July 2003 that North Korea had reprocessed a small number of the fuel rods. (See CRS Report RS21391, *North Korea's Nuclear Weapons: How Soon an Arsenal?)*

Bush Administration Policy

The Bush Administration's policy response to North Korean actions since October 2002 is based on two factors within the Administration. First, President Bush has voiced profound distrust of North Korea and its leader, Kim Jong-il. Second, there are divisions over policy toward North Korea among factions within the Bush Administration. An influential coalition consists of Pentagon officials and advisers around Secretary of Defense Rumsfeld, officials of Vice President Cheney's office, and proliferation experts in the State Department and White House led by Undersecretary of State John Bolton. They reportedly oppose negotiations with North Korea, favor the issuance of demands for unilateral North Korean concessions on nuclear and other military issues, and advocate an overall U.S. strategy of isolating North Korea diplomatically and through economic sanctions and bringing about a collapse of the North Korean regime. A second faction, mainly in the State Department, is led by Secretary of State Powell and is composed of officials with experience on East Asian and Korean issues. This faction believes that the Administration should attempt negotiations before adopting more coercive measures, and they reportedly doubt the effectiveness of a strategy to bring about a North Korean collapse.

These factors have impacted on policy in several ways. North Korea became a principal target in the war on terrorism because of its weapons of mass destruction and proliferation activities. The Bush Administration has shown a consistent reluctance/aversion to negotiating with North Korea. Much of its public positions on North Korea has been demands for unilateral North Korean military concessions, including dismantlement of nuclear and missile programs, withdrawal of conventional forces from the demilitarized zone separating North and South Korea, and dismantlement of chemical and biological weapons. Some within the Administration view North Korea as weak with the potential for collapse. Administration officials of both factions express the view that other governments should endorse the U.S. position fully. Officials, apparently from the Pentagon-Cheney office-Bolton coalition, assert that North Korean provocations will escalate to a point at which other governments will join the United States in isolating North Korea through economic

sanctions. Since the Beijing meeting in April, the Bush Administration has warned of and has proposed coercive measures against North Korea. President Bush reportedly reacted strongly to North Korea's threat at Beijing to export nuclear materials. Until Bush's offer of a U.S. security guarantee in October 2003, Administration officials reportedly indicated that they believed that the Administration does not have to offer reciprocal measures for North Korean concessions.

Major elements of the Administration's strategy are:

(1) Progressive suspension of the Agreed Framework: Administration officials have stated that the Agreed Framework will be terminated. In November 2002, the Administration's initiative led the Korean Peninsula Development Organization (KEDO, the international body administering the 1994 Agreed Framework) to suspend heavy oil shipments to North Korea — a key component of the Agreed Framework — beginning in December 2002. North Korea cited this as justification for re-starting the Yongbyon nuclear facilities. In the summer of 2003, the Administration pressed other KEDO members to terminate the construction of the light water nuclear reactors promised to North Korea in the Agreed Framework. Administration officials stated in August 2003 that the reactor construction would be terminated or suspended long term by October 2003. In January 2003, the Administration decided to request of Congress $3 million dollars for the continuance of KEDO in FY2003. Congress approved $5 million.

(2) Diplomatic strategy: Following North Korea's reported disclosure of a secret uranium enrichment program, the Bush Administration adopted the position that North Korea must dismantle its nuclear programs before the United States would negotiate over other issues, including U.S. reciprocal measures. The Administration rejected North Korea's proposal for bilateral negotiations. On January 7, 2003, the Administration proposed a dialogue with North Korea that would not be the negotiation of a new agreement. In a communique of January 7, 2003, with Japan and South Korea, the proposal stated that "the United States is willing to talk to North Korea about how it will meet its obligations to the international community" but that "the United States will not provide quid pro quos to North Korea to live up to its existing obligations." In February 2003, the Administration began to promote a multilateral forum to include South Korea, Japan, China, and Russia. However, the Administration agreed to China's proposal for a three party meeting (China, North Korea, and the United States) in Beijing in April 2003. President Bush reportedly restricted what the chief U.S. official at Beijing could say to only re-stating the Administration's public position that North Korea must dismantle its nuclear programs before the United States would discuss with it ways to improve U.S.-North Korean relations. Administration diplomacy achieved six-party talks in Beijing in August 2003, and the Administration shifted its position on negotiations. The Administration indicated that it would specify the steps that North Korea must take to dismantle its nuclear programs, discuss U.S. reciprocal measures after North Korea "begins" steps to dismantle, develop a proposal for a written multilateral security guarantee to North Korea (Bush's offer of October 20, 2003), consider proposing a peace treaty or "peace mechanism," and offer North Korea a normalization of relations with the United States at the end of a settlement process.

(3) Forming an international coalition to pressure North Korea to end its nuclear program: The Administration's multilateral forum proposal and offer of a multilateral security guarantee are moves in this strategy. Administration diplomacy has aimed at

securing support from other governments for a regime of economic sanctions against North Korea. Japan is imposing restrictions on North Korean economic activity in Japan. South Korea states that it will suspend cooperative projects with North Korea if North Korea does not end its nuclear programs, but South Korean officials also indicate a deep reluctance to terminate such projects. The Administration has placed emphasis on China as a source of pressure on North Korea, citing China's stated support for a non-nuclear Korean peninsula. China has a mutual defense treaty with North Korea and supplies North Korea with an estimated 90% of its oil and 40% of its food. China, South Korea, and Russia have withheld full support from the U.S. position, causing frustration within the Administration. Their governments criticize the Bush Administration for not negotiating with North Korea. They all advocate that the United States offer North Korea a security guarantee and economic assistance in any agreement on nuclear weapons. They stated opposition to the U.S. attempt to have the U.N. Security Council formally take up the issue in early April 2003, and China blocked Security Council action. China reportedly pressured North Korea to adopt greater flexibility regarding its demand for bilateral talks with the United States and refrain from provocations, leading to the three-party and six-party Beijing meetings. However, China apparently made diplomatic commitments to North Korea, including support for North Korean opposition to U.N. Security Council consideration and North Korea's proposal of a security guarantee from the United States. There reportedly is debate within the Chinese government over policy toward North Korea. There are influential parties who advocate that China cut or end support of North Korea, but influential elements of the China military reportedly oppose breaking China's traditional ties to North Korea. However, the Chinese government's official position remains opposed to economic sanctions and asserts that the United States should offer a comprehensive negotiating proposal including security guarantees and economic aid for North Korea. Russia, which borders on North Korea, shares the Chinese position.

(4) Planning economic sanctions and military interdiction if North Korea does not end its nuclear program: The Administration reportedly has drafted plans for economic sanctions, including cutting off financial flows to North Korea from Japan and other sources and interdicting North Korean weapons shipments to the Middle East and South Asia. President Bush proposed a Proliferation Security Initiative aimed at interdicting exports of weapons of mass destructions and illegal drugs by proliferator countries, especially North Korea. The United States and ten other countries are planning measures to interdict North Korean sea and air traffic. Japan has begun to restrict financial flows to North Korea. Taiwan detained a North Korean ship in August 2003 and removed chemicals that could be used in weapons of mass destruction; the CIA reportedly advised Taiwan authorities on the contents of the ship.

(5) Ambivalence concerning U.S. military options if North Korea fully activates its nuclear program: The Administration has stressed that the United States would not attack North Korea; this was in response to North Korea's repeated charge that the United States planned a pre-emptive attack and to concerns voiced by China, Russia, and South Korea. In February 2003, Administration statements on military options focused on the growing belief that North Korea would attempt to reprocess the 8,000 spent nuclear fuel rods at Yongbyon into weapons-grade plutonium and produce five or six atomic bombs. In late 2002, Clinton Administration officials disclosed that in 1994, the Administration had approved a Pentagon plan to bomb Yongbyon to prevent reprocessing of the fuel rods. However, recent press reports and statements by Bush Administration officials claim that the United States has only

limited intelligence capabilities to learn whether or not North Korea has reprocessed and that the Administration is uncertain of the situation. Recent statements by Pentagon officials indicate that plans for direct military action against North Korea envisage strikes against multiple targets, including North Korean artillery on the demilitarized zone, rather than a strike solely against North Korea's nuclear installations. However, the extensive commitment of U.S. ground forces to Iraq, Afghanistan, and other locations limits the ability of the United States to commit sizeable ground forces to any Korean contingency.

North Korea's Nuclear Program

Most of North Korea's plutonium-based nuclear installations are located at Yongbyon, 60 miles of the North Korean capital of Pyongyang. They are the facilities covered by the 1994 U.S.-North Korean Agreed Framework The key installations are:

- **An atomic reactor, with a capacity of about 5 megawatts that began operating by 1987:** it is capable of expending enough uranium fuel to produce about 7 kilograms of plutonium annually — enough for the manufacture of a single atomic bomb annually. North Korea in 1989 shut down the reactor for about 70 days; U.S. intelligence agencies believe that North Korea removed fuel rods from the reactor at that time for reprocessing into plutonium suitable for nuclear weapons. In May 1994, North Korea shut down the reactor and removed about 8,000 fuel rods, which could be reprocessed into enough plutonium for 4-6 nuclear weapons. North Korea started operating the reactor again in February 2003.

- **Two larger (estimated 50 megawatts and 200 electrical megawatts) atomic reactors under construction at Yongbyon and Taechon since 1984:** According to U.S. Ambassador Robert Gallucci, these plants, if completed, would be capable of producing enough spent fuel annually for 200 kilograms of plutonium, sufficient to manufacture nearly 30 atomic bombs per year.

- **A plutonium reprocessing plant about 600 feet long and several stories high:** The plant would separate weapons grade Plutonium-239 from spent nuclear fuel rods for insertion into the structure of atomic bombs or warheads. U.S. intelligence agencies reportedly detected North Korean preparations to restart the plutonium reprocessing plant in February and March 2003. According to press reports, the CIA estimated in July 2003 that North Korea had reprocessed several hundred of the 8,000 fuel rods.

Satellite photographs reportedly also show that the atomic reactors have no attached power lines, which they would have if used for electric power generation.

Persons interviewed for this study believe that North Korea developed the two reactors and the apparent reprocessing plant with its own resources and technology. It is believed that Kim Jong-il, the son and successor of President Kim Il-sung who died in July 1994, directs the program, and that the military and the Ministry of Public Security (North Korea's version of the KGB) implement it. North Korea reportedly has about 3,000 scientists and research

personnel devoted to the Yongbyon program. Many have studied nuclear technology (though not necessarily nuclear weapons production) in the Soviet Union and China and reportedly Pakistan. North Korea has uranium deposits, estimated at 26 million tons. North Korea is believed to have one uranium producing mine.

North Korea's secret uranium enrichment program appears to date from at least 1996. Hwang Jang-yop, a Communist Party secretary who defected in 1997, has testified that North Korea and Pakistan agreed in the summer of 1996 to trade North Korean long-range missile technology for Pakistani uranium enrichment technology. The Clinton Administration reportedly learned of it in 1998 or 1999, and a Department of Energy report of 1999 cited evidence of the program. In March 2000, President Clinton notified Congress that he was waiving certification that "North Korea is not seeking to develop or acquire the capability to enrich uranium." The Japanese newspaper, *Sankei Shimbun*, reported on June 9, 2000, the contents of a "detailed report" from Chinese government sources on a secret North Korean uranium enrichment facility inside North Korea's Mount Chonma. Reportedly, according to a CIA report to Congress, North Korea attempted in late 2001 to acquire "centrifuge-related materials in large quantities to support a uranium enrichment program." The CIA estimated publicly in December 2002 that North Korea could produce two atomic bombs annually through uranium enrichment beginning in 2005; according to *U.S. News and World Report*, September 1, 2003, the CIA advanced its projected date to mid to late 2004. Administration officials have stated that they do not know the locations of North Korea's uranium enrichment program, but U.S. intelligence agencies reportedly have extensive information on North Korea's accelerated overseas purchases of equipment and materials for the uranium enrichment program since early 1999.

International Assistance

Knowledgeable individuals believe that the Soviet Union did not assist directly in the development of Yongbyon in the 1980s. The U.S.S.R. provided North Korea with a small research reactor in the 1960s, which also is at Yongbyon. However, North Korean nuclear scientists continued to receive training in the U.S.S.R. up to the demise of the Soviet Union in December 1991. East German and Russian nuclear and missile scientists reportedly were in North Korea throughout the 1990s. Since 1999, reports have appeared that U.S. intelligence agencies had information that Chinese enterprises were supplying important components and raw materials for North Korea's missile program.

North Korea's Delivery Systems

North Korea succeeded by 1998 in developing a "Nodong" missile with a range estimated at up to 900 miles, capable of covering South Korea and most of Japan. North Korea reportedly deployed nearly 100 Nodong missiles by 2003. On August 31, 1998, North Korea test fired a three stage rocket, apparently the prototype of the Taepo Dong-1 missile; the third stage apparently was an attempt to launch a satellite. U.S. intelligence estimates reportedly concluded that such a missile would have the range to reach Alaska, Guam, and the Northern Marianas Commonwealth. Media reports in early 2000 cited U.S. intelligence findings that, without further flight tests, North Korea could deploy an intercontinental ballistic missile that would be capable of striking Alaska, Hawaii, and the U.S. west coast. Japan's *Sankei Shimbun* newspaper reported on August 6, 2003, that North Korea and Iran were negotiating a deal for the export of the long-range Taepodong-2 missile

to Iran and the joint development of nuclear warheads. U.S. officials reportedly told Japanese counterparts in July 2003 that North Korea was close to developing nuclear warheads for its missiles. They claimed in September 2003 that North Korea had developed a more accurate, longer-range intermediate ballistic missile that could reach Okinawa and Guam (site of major U.S. military bases) and that there was evidence that North Korea had produced the Taepo-dong 2 that could reach Alaska, Hawaii, and the U.S. west coast.

These projections led the Clinton Administration to press North Korea for new talks over North Korea's missile program. In talks held in 1999 and 2000, North Korea demanded $1 billion annually in exchange for a promise not to export missiles. U.S. negotiators rejected North Korea's demand for $1 billion but offered a lifting of U.S. economic sanctions. This laid the ground for the Berlin agreement of September 1999 in which North Korea agreed to defer further missile tests in return for the lifting of major U.S. economic sanctions. President Clinton formalized the lifting of key economic sanctions against North Korea in June 2000. North Korea continued the moratorium, but it in effect used Pakistan and Iran as surrogates in testing intermediate range missiles based on North Korean technology. (See CRS Report RS21473, *North Korean Ballistic Missile Threat to the United States.*)

State of Nuclear Weapons Development

Until December 2001, U.S. intelligence agencies had disclosed an estimate that North Korea had extracted enough plutonium from its nuclear reactor to produce one or two nuclear weapons. However, in that month, the U.S. National Intelligence Council issued a revised finding that "North Korea has produced one, possibly two, nuclear weapons." North Korea's approximately 70 day shutdown of the five megawatt reactor in 1989 gave it the opportunity to remove nuclear fuel rods, from which plutonium is reprocessed. The U.S. Central Intelligence Agency and the Defense Intelligence Agency reportedly estimated in late 1993 that North Korea extracted enough fuel rods for about 12 kilograms of plutonium — sufficient for one or two atomic bombs. The CIA and DIA apparently based their estimate on the 1989 shutdown of the five megawatt reactor.

South Korean and Japanese intelligence estimates reportedly are higher: 16-24 kilograms (Japan) and 7-22 kilograms (South Korea). These estimates reportedly are based on the view that North Korea could have acquired a higher volume of plutonium from the 1989 reactor shutdown and the view of a higher possibility that North Korea removed fuel rods during the 1990 and 1991 reactor slowdowns. Russian Defense Ministry analyses of late 1993 reportedly came to a similar estimate of about 20 kilograms of plutonium, enough for 2 or 3 atomic bombs.

There also is a body of analysis suggesting that North Korea could produce more nuclear weapons from a given amount of plutonium than standard intelligence estimates have believed. State Department and U.S. intelligence estimates of the plutonium/bomb production ratio are close to the IAEA standard that a non-nuclear state would need about eight kilograms of plutonium to produce a nuclear bomb. However, IAEA spokesman, David Kyd, stated in August 1994 that Agency officials have known for some time that the eight kilogram standard was too high. He said that the IAEA retained it because of the wishes of member governments.

A report of the National Resources Defense Council used North Korea as a standard non-nuclear state and concluded that a non-nuclear state with "low technology" could produce a one kiloton bomb (a small atomic bomb "with the potential to kill tens of thousands of people") with three kilograms of plutonium. A non-nuclear state with "medium technology" could produce a one kiloton bomb with 1.5 kilograms of plutonium.

Before the Natural Resources Defense Council released the report, the U.S. Department of Energy in January 1994 lowered its mean estimate of plutonium required for a small atomic bomb from eight to four kilograms. Secretary of Defense Perry suggested in July 1994 that, with a higher level of technology, North Korea could produce more nuclear weapons with a given amount of plutonium: "If they had a very advanced technology, they could make five bombs out of the amount of plutonium we estimate they have."

Russian intelligence agencies also reportedly have learned of significant technological advances by North Korea towards nuclear weapons production. On March 10, 1992, the Russian newspaper Argumenty I Fakty (Arguments and Facts) published the text of a 1990 Soviet KGB report to the Soviet Central Committee on North Korea's nuclear program. It was published again by Izvestiya of June 24, 1994. The KGB report asserted that "According to available data, development of the first nuclear device has been completed at the DPRK nuclear research center in Yongbyon." The North Korean Government, the report stated, had decided not to test the device in order to avoid international detection.

Additionally, there are a number of reports and evidence that point to at least a middle range likelihood that North Korea may have smuggled plutonium from Russia. In June 1994, the head of Russia's Counterintelligence Service (successor to the KGB) said at a press conference that North Korea's attempts to smuggle "components of nuclear arms production" from Russia caused his agency "special anxiety." U.S. executive branch officials have expressed concern in background briefings over the possibility that North Korea has smuggled plutonium from Russia. One U.S. official, quoted in the Washington Times, July 5, 1994, asserted that "There is the possibility that things having gotten over the [Russia-North Korea] border without anybody being aware of it." The most specific claim came in the German news magazine *Stern* in March 1993, which cited Russian Counterintelligence Service reports that North Korea had smuggled 56 kilograms of plutonium (enough for 7-9 atomic bombs) from Russia.

According to press reports in late 2002, the CIA concluded that North Korea accelerated its uranium enrichment program in the 1999, 2000, and 2001. According to *U.S. News and World Report*, September 1, 2003, the CIA estimated that North Korea could produce a uranium-based atomic weapon by the second half of 2004.

Diplomatic Background to the Agreed Framework and Amending Agreements

North Korea had signed the Nuclear Non-Proliferation Treaty (NPT) in 1985. In a denuclearization agreement signed in December 1991, North Korea and South Korea pledged not to possess nuclear weapons, not to possess plutonium reprocessing or uranium enrichment facilities, and to negotiate a mutual nuclear inspection system. In January 1992, North Korea signed a safeguards agreement with the International Atomic Energy Agency (IAEA), which requires North Korea to report all nuclear programs to the IAEA and gives

the IAEA the right to conduct a range of inspections of North Korean nuclear installations and programs. In 1992, North Korea rebuffed South Korea regarding implementation of the denuclearization agreement, but it did allow the IAEA to conduct six inspections during June 1992-February 1993.

In late 1992, the IAEA found evidence that North Korea had reprocessed more plutonium than the 80 grams it had disclosed to the Agency. In February 1993, the IAEA invoked a provision in the safeguards agreement and called for a "special inspection" of two concealed but apparent nuclear waste sites at Yongbyon. The IAEA believed that a special inspection would uncover information on the amount of plutonium which North Korea had produced since 1989. North Korea rejected the IAEA request and announced on March 12, 1993, an intention to withdraw from the NPT.

The NPT withdrawal threat led to low and higher level diplomatic talks between North Korea and the Clinton Administration. North Korea "suspended" its withdrawal from the NPT when the Clinton Administration agreed to a high-level meeting in June 1993. However, North Korea continued to refuse both special inspections and IAEA regular inspections of facilities designated under the safeguards agreement. In May 1994, North Korea refused to allow the IAEA to inspect the 8,000 fuel rods, which it had removed from the five megawatt reactor. In June 1994, North Korea's President Kim Il-sung reactivated a longstanding invitation to former U.S. President Jimmy Carter to visit Pyongyang. Kim offered Carter a freeze of North Korea's nuclear facilities and operations. Kim took this initiative after China reportedly informed him that it would not veto a first round of economic sanctions, which the Clinton Administration had proposed to members of the U.N. Security Council. According to former Defense Secretary William Perry, the Pentagon also developed a contingency plan to bomb the Yongbyon nuclear facilities if North Korea began to reprocess the 8,000 fuel rods into weapons-grade plutonium. The Clinton Administration reacted to Kim's proposal by dropping its sanctions proposal and entering into a new round of high-level negotiations with North. This negotiation led to the Agreed Framework of October 21, 1994.

The Agreed Framework: Provisions, Implementation, Costs, Future Issues

U.S. Objectives: Primacy to the Freeze of North Korea's Nuclear Program

The heart of the Agreed Framework was a U.S. commitment to provide North Korea with a package of nuclear, energy, economic, and diplomatic benefits; in return North Korea would halt the operations and infrastructure development of its nuclear program. The Agreed Framework committed North Korea to "freeze its graphite-moderated reactors and related facilities" with the freeze monitored by the IAEA. Ambassador Robert Gallucci, who negotiated for the United States, stated that "related facilities" include the plutonium reprocessing plant and stored fuel rods. According to Gallucci, the freeze includes a halt to construction of the 50 and 200 megawatt reactors and a North Korean promise not to refuel the five megawatt reactor. The Agreed Framework also committed North Korea to store the 8,000 fuel rods removed from the five megawatt reactor in May 1994 "in a safe manner that

does not involve reprocessing in the DPRK [North Korea]." Clinton Administration officials reportedly said that a secret "confidential minute" to the Agreed Framework prohibits North Korea from construction of new nuclear facilities elsewhere in North Korea.

Gallucci and other officials emphasized that the key policy objective of the Clinton Administration was to secure a freeze of North Korea's nuclear program in order to prevent North Korea from producing large quantities of nuclear weapons grade plutonium through the operations of the 50 and 200 megawatt reactors and the plutonium reprocessing plant at Yongbyon. Gallucci referred to the prospect of North Korea producing enough plutonium annually for nearly 30 nuclear weapons if the 50 and 200 megawatt reactors went into operation. The Administration's fear was that North Korea would have the means to export atomic bombs to other states and possess a nuclear missile capability that would threaten Japan and U.S. territories in the Pacific Ocean.

Benefits to North Korea

Light Water Nuclear Reactors. North Korea was to receive two light water reactors (LWRs) with a generating capacity of approximately 2,000 megawatts. The Agreed Framework set a "target date" of 2003. The United States was obligated to organize an international consortium arrangement for the acquisition and financing of the reactors. The Clinton Administration and the governments of South Korea, Japan, and other countries established in March 1995 the Korean Peninsula Energy Development Organization (KEDO) to coordinate the provision of the LWRs. After the groundbreaking at the reactor site in August 1997, KEDO officials changed the estimated completion date from 2003 to 2007; other experts predicted a much later date. North Korean obstructionism and provocative military acts toward South Korea and bureaucratic problems resulted in some of the delay; but U.S. officials have acknowledged off the record that the Clinton Administration was in no hurry to move the project along. The laying of the foundation for the LWRs occurred in August 2002.

Oil at No Cost. Prior to the construction of light water reactors, the Agreed Framework committed the United States to provide North Korea 500,000 metric tons of heavy oil to North Korea annually until the first of the two light water reactors becomes operational. The oil shipments continued until KEDO's decision in November 2002 to cancel future shipments because of North Korea's secret uranium enrichment program.

Diplomatic Representation. The United States and North Korea announced in the Agreed Framework an intention to open liaison offices in each other's capital and establish full diplomatic relations if the two governments make progress "on issues of concern to each side." By April 1995, most technical arrangements for liaison offices were completed. However, North Korea displayed reluctance to finalize arrangements, and talks over liaison offices waned. Ambassador Gallucci asserted that a full normalization of diplomatic relations would depend on a successful resolution of non-nuclear military issues, especially the heavy deployment of North Korean conventional military forces along the demilitarized zone separating North and South Korea and North Korea's program to develop and sell to other governments longer range missiles. In October 1999, William Perry, the Administration's Special Adviser on North Korea, cited normalization of diplomatic relations as one of the benefits which the United States could offer North Korea for new agreements on nuclear and missile issues.

Lifting the U.S. Economic Embargo. The Agreed Framework specifies that within three months from October 21, 1994, the two sides will reduce barriers to trade and investment, including restrictions on telecommunications services and financial transactions. This required the Clinton Administration to relax the U.S. economic embargo on North Korea, which the Truman Administration and Congress put in place during the Korean War. On January 20, 1995, the Administration announced initial measures, including permission for telecommunications links with North Korea, permission for U.S. citizens to use credit cards in North Korea, permission for American media organizations to open offices in North Korea, permission for North Korea to use U.S. banks in financial transactions with third countries, and permission for U.S. steel companies to import magnesite from North Korea. North Korea pressed the Clinton Administration to end all economic sanctions. North Korea complained loudly that these measures failed to meet the commitment stated in the Agreed Framework. In U.S.-North Korean talks in September 1999, the United States agreed to end a broader range of economic sanctions in exchange for a North Korean moratorium on future missile testing. President Clinton ordered the end of most economic sanctions in June 2000. Since then, North Korea has not met with a single American firm to talk about trade and/or investment opportunities and has rejected an offer from the American Chamber of Commerce in Seoul to send a business delegation to Pyongyang.

U.S. Nuclear Security Guarantee. Article III of the Agreed Framework states that "Both sides will work together for peace and security on a nuclear-free Korean peninsula." Under that heading, it states, "The U.S. will provide formal assurances to the DPRK against the threat or use of nuclear weapons by the U.S." While the language is not totally clear on the timing of the U.S. delivery of a formal nuclear security guarantee, it seems to imply that this would come when North Korea had dismantled its nuclear program or at least had advanced dismantlement to a considerable degree.

North Korean Obligations Beyond the Freeze of the Nuclear Program

North Korea's immediate obligation was to freeze its existing nuclear installations. The Agreed Framework alluded to certain other obligations for Pyongyang. Ambassador Gallucci and other Clinton Administration officials were more specific in describing these. They disclosed the existence of a secret minute that the Administration and North Korea concluded in conjunction with completion of the Agreed Framework. North Korea, however, has not acknowledged such a secret minute.

Inspections and Broader Nuclear Obligations. The Agreed Framework contained a clause which the Administration claims constitutes a North Korean obligation to allow the IAEA to conduct the special inspection of the two suspected nuclear waste sites at Yongbyon in conjunction with the delivery of equipment for the light water reactors. The Agreed Framework stated: "When a significant portion of the LWR [light water reactor] project is completed, but before delivery of key nuclear components, the DPRK will come into full compliance with its safeguards agreement with the IAEA, including taking all steps that may be deemed necessary by the IAEA, following consultations with the Agency, with regard to verifying the accuracy and completeness of the DPRK's initial report on all nuclear material in the DPRK." Ambassador Gallucci contended that North Korea must accept a special inspection before the key nuclear components of the first light water reactor are

delivered to North Korea, if the IAEA still wishes to conduct a special inspection. However, North Korean descriptions of its obligations omitted reference to special inspections.

The Agreed Framework stated, "The DPRK will remain a party to the Treaty on the Non-Proliferation of Nuclear Weapons (NPT) and will allow implementation of its [1992] safeguards agreement under the Treaty." Gallucci stated in congressional testimony that the Agreed Framework did not restrict the right of the IAEA to invoke special inspections if it discovered any new North Korean nuclear activities. Gallucci said that the Agreed Framework only restricted the IAEA with respect to the two suspected nuclear waste sites and the nuclear installations and the stored fuel rods at Yongbyon and Taechon. He stressed that any new North Korean nuclear program would fall immediately under the IAEA-North Korea safeguards agreement and that North Korea must place it under IAEA safeguards. Failure to do so, he said, would constitute a violation of the Agreed Framework. Thus, North Korea's secret uranium enrichment program violated this clause of the Agreed Framework.

In the Agreed Framework, North Korea pledged to "consistently take steps to implement the [1991] North-South Joint Declaration on the Denuclearization of the Korean Peninsula." North Korea thus extended its obligations to South Korea in the North-South denuclearization agreement to the United States. This clause of the Agreed Framework also is relevant to North Korea's secret uranium enrichment program, since the North-South denuclearization agreement specifically prohibits uranium enrichment.

Disposition of Fuel Rods from the Five Megawatt Reactor. Following Kim Il-sung's offer of a nuclear freeze to former President Carter, Administration officials stressed the importance of securing North Korean agreement to the removal to a third country of the 8,000 fuel rods which North Korea removed from the five megawatt reactor in May 1994. However, the Administration abandoned the objective of securing an immediate removal of the rods after the negotiations started in September 1994. It also gave up support for the IAEA's attempts to inspect the fuel rods in order to gain information on the amount of weapons grade plutonium that North Korea secured from the five megawatt reactor prior to 1994. The Agreed Framework provided for the storage of the rods in North Korea under IAEA monitoring and a North Korean promise not to reprocess plutonium from the rods. It also provided for subsequent talks on the "ultimate disposition" of the rods.

Dismantlement of Nuclear Installations. The Agreed Framework states that "Dismantlement of the DPRK's graphite-moderated reactors and related facilities will be completed when the LWR project is completed." North Korea's proposal at the 2003 Beijing talks in effect would continue the linkage between dismantlement and completion of the light water reactors. The Bush Administration wants dismantlement much earlier in a settlement process.

Role of Congress

Congress has voiced much skepticism regarding the Agreed Framework, but its actions have given the Administration flexibility in implementing U.S. obligations. Congress has played three roles. First, there have been numerous oversight hearings. Second, Congress included in the Omnibus Appropriations bill for FY1999 (H.R. 4328) the requirement that the President certify progress in negotiations with North Korea over the nuclear, missile, and

other issues before the Administration could allocate money to KEDO operations. President Clinton issued two such certifications in 1999 and 2000; in 2000, he said that he could not certify that North Korea was not engaged in uranium enrichment. President Bush notified Congress in March 2002 that he could not certify that North Korea was abiding by the Agreed Framework, but he waived restricting money for KEDO. H.R. 4328 also called on the President to name "a very senior presidential envoy" as "North Korea Policy Coordinator" to conduct a review of U.S. policy and direct negotiations with North Korea. This resulted in President Clinton's appointment of William Perry as a special adviser and the issuance of the Perry report in October 1999. The Bush Administration, however, terminated the senior envoy position. Third, Congress considered and approved Administration requests for funds to finance implementation, including the heavy oil shipments.

On October 20, 1994, President Clinton sent a letter to North Korean leader, Kim Jong-il, stating that he "will use the full powers of my office" to carry out U.S. obligations related to light water reactors and alternative energy (oil). President Clinton added that if contemplated arrangements for light water reactors and alternative energy were not completed, he would use the powers of his office to provide light water reactors and alternative energy from the United States "subject to the approval of the U.S. Congress."

In early 2003, Congress accepted the Bush Administration's proposal to continue funding the administrative costs of KEDO. The Consolidated Appropriations Act for FY2003 (H.J.Res. 2) appropriated $5 million for KEDO. In April 2003, the House of Representatives passed amendments to the Energy bill (H.R. 6) that effectively would end U.S. involvement in the construction of the light water reactors in North Korea. H.R. 6 prohibits the transfer of U.S. nuclear materials and technology to North Korea, bars other countries from transferring U.S.-based nuclear technology to North Korea, requires the U.S. delegate to KEDO to vote against approval of any foreign reactor design for North Korea, and prohibits U.S. government indemnity insurance for any U.S. company seeking to participate in the LWR project.

FOR ADDITIONAL READING

CRS Issue Brief IB98045. *Korea: U.S.-South Korean Relations — Issues for Congress.*

CRS Report RS21391. *North Korea's Nuclear Weapons: How Soon an Arsenal?*

CRS Report RS21473. *North Korean Ballistic Missile Threat to the United States.*

CRS Report RL31696. *North Korea: Economic Sanctions.*

CRS Report RL31785. *U.S. Assistance to North Korea.*