IAEA Probes Seoul's Nuclear Program

Inspectors from the International Atomic Energy Agency (IAEA) have been investigating South Korea’s nuclear-related facilities after learning that its government secretly produced small quantities of nuclear material, apparently in violation of its IAEA safeguards agreement. The experiments involved uranium and plutonium, both used as explosive materials in a nuclear weapon.

IAEA Director-General Mohamed ElBaradei told the agency’s Board of Governors Sept. 13 that South Korea had conducted “laboratory-scale experiments” in 2000 to enrich uranium “using the atomic vapour laser isotope separation method.” This technology separates lighter uranium-235, the necessary uranium isotope for fissile material, from heavier uranium-238.

ElBaradei said the laser-enrichment experiments utilized a “small amount” of natural uranium metal, which had been converted from a less-processed form of uranium. South Korea produced 150 kilograms of the material in the 1980s, ElBaradei said. Seoul also informed the IAEA that in 1982 it had separated a small amount of plutonium from 2.5 kilograms of irradiated depleted uranium.

Plutonium separation and uranium enrichment can each produce fissile material for nuclear weapons. But South Korean officials say neither the plutonium nor uranium activities have produced nearly enough material sufficient for making a weapon. ElBaradei stated that, according to South Korea, the laser experiments produced only 200 milligrams of enriched uranium.

Calling it “a matter of serious concern,” ElBaradei said Seoul did not report these activities to the IAEA when they were conducted, although South Korea’s safeguards agreement required it to do so.

The revelations came as South Korea submitted an expanded declaration of its nuclear activities, as required by its newly ratified additional protocol to its safeguards agreement. Safeguards agreements require states-parties to the nuclear Nonproliferation Treaty (NPT) to allow the IAEA to monitor their declared civilian nuclear activities to ensure that they are not diverted to military use. The protocol, which South Korea ratified in February, requires NPT members to declare a significantly broader range of their nuclear-related activities than required by safeguards agreements alone. The protocol also provides the IAEA with expanded authority to investigate states-parties’ nuclear facilities, be they declared or undeclared.

South Korea acceded to the NPT in 1975. Seoul had a nuclear weapons program before then but discontinued it under U.S. pressure later that decade (see page 34). That program included attempts to obtain a reprocessing facility to separate plutonium from spent fuel. South Korea has had a substantial civilian nuclear power industry for decades, but obtains its fresh nuclear fuel from other countries and does not reprocess its spent fuel.

South Korean officials insist that the newly disclosed experiments are not related to weapons research. Not only does its status as an NPT member state forbid South Korea from developing nuclear weapons, but Seoul also signed a joint declaration with North Korea in 1991 stating that both countries will refrain from possessing nuclear reprocessing and uranium-enrichment facilities.

Next Steps, Remaining Questions

According to ElBaradei, the IAEA is continuing to investigate South Korea’s nuclear activities and will issue a report in November.
One of several remaining questions about Seoul's nuclear program is the precise concentration of U-235 that the enriched uranium contained. ElBaradei told reporters Sept. 13 that “the average [uranium] enrichment” was 10 percent U-235, but added that “there could be some higher peak” of enrichment. Chang In-soon, president of the Korean Atomic Energy Research Institute, told The Washington Post Sept. 8 that none of the enriched uranium contained much more than the average level of U-235.

In a Sept. 16 interview, however, a diplomatic source in Vienna close to the IAEA confirmed a Sept. 12 Washington Post report that South Korea had enriched uranium to 77 percent, a level theoretically sufficient for a nuclear weapon. Uranium enriched to 20 percent concentration or less of U-235 is used to fuel civilian nuclear weapons plants, not build nuclear weapons.

The extent of high-level government involvement in the experiments is also unclear at this stage. South Korean officials told the IAEA that scientists acting “without the knowledge or authorization of the...government” initiated and carried out the experiments for research purposes.

However, the Vienna source told Arms Control Today that that there are serious questions as to whether this claim is accurate, pointing out that the experiments were conducted in government facilities.

Additionally, Seoul’s cooperation with the IAEA appears to be an issue. The source confirmed a Sept. 12 Washington Post report that South Korea had refused more than one IAEA attempt to inspect facilities associated with its laser-enrichment program. A South Korean embassy official interviewed Sept. 23 said that Seoul was not obligated to allow such inspections because it had not yet ratified its additional protocol.

As for the plutonium experiments, the Vienna source said the IAEA took samples at a site in South Korea in 1997 and 2003 and found evidence of separated plutonium, adding that South Korean officials disregarded the IAEA’s concerns during discussions last December.

The South Korean official said Seoul began “consultations” with the agency after the samples were taken but had trouble providing the necessary information. The government had no records of the experiment and the relevant scientists had either died or left the country, the official said.

According to a Sept. 9 Chosun Ilbo article, South Korea’s Ministry of Science and Technology stated that the government reported the experiments to the IAEA in 1983, but the report contained an error which caused confusion.

The United States has downplayed the IAEA’s revelations and seems content to let the agency deal with the matter for the time being. Department of State spokesperson Richard Boucher told reporters Sept. 10 that the United States does not view South Korea’s experiments as “nuclear weapons activities,” adding that it is “premature” to speculate on whether South Korea’s activities will be referred to the UN Security Council until the IAEA completes its investigation.

The IAEA Board of Governors is required to report findings of a country’s noncompliance with its safeguards agreement to the Security Council, which then has the option of taking action against the offending government. The United States has been pushing for such a referral in the case of Iran, who has conducted extensive clandestine nuclear activities, including both laser- and gas centrifuge-based uranium-enrichment programs. Undersecretary of State for Arms Control and International Security John Bolton told reporters Sept. 10 that the United States will not “apply a double standard” to South Korea.

As for South Korea’s neighbor to the north, the revelations about Seoul’s nuclear activities may have already impacted the ongoing six-party talks designed to resolve the crisis caused by North Korea’s nuclear weapons program. In a Sept. 16 statement, a North Korean Foreign Ministry spokesperson linked the issue to its participation in the next round of talks, saying Pyongyang “can never sit at the table to negotiate its nuclear weapon program unless truth about the secret nuclear experiments in South Korea is fully probed.”
The spokesperson did not explicitly say that Pyongyang will not participate in future talks, but talks slated for September did not take place.

Déjà Vu? Seoul's Past Nuclear Program

Paul Kerr

The recent revelations about South Korea’s nuclear experiments recall a little-known chapter of three-decade-old history: Seoul began a nuclear weapons program in 1974, which it formally ended under U.S. pressure in late 1976.

There are indications that South Korean President Pak Chong-hui discussed developing nuclear weapons with other cabinet members as early as 1969, ultimately deciding five years later to go forward. According to a 1978 CIA assessment, Pak wanted to develop “nuclear weapons technology” but postponed deciding whether actually to build such weapons.

Because it had already begun an extensive civilian nuclear power program, South Korea sought to use such facilities to shield its effort to develop a plutonium-based nuclear weapon. The most worrisome elements of this effort at the time were Seoul’s attempts to obtain a spent-nuclear-fuel reprocessing facility from France, a heavy-water research reactor from Canada, and a fuel-fabrication facility from Belgium. Reprocessing spent nuclear reactor fuel allows a country to separate plutonium for nuclear weapons, and doing so is particularly easy with heavy-water reactors of the type South Korea wanted to purchase.

The CIA estimated that the reprocessing facility South Korea sought could have separated enough plutonium for one nuclear weapon per year. Moreover, after acquiring these plants, the CIA said, South Korea would have been better positioned to construct its own nuclear facilities and produce even more weapons.

South Korea also had a nuclear weapons design team, but it “employed no more than a few dozen scientists,” the CIA assessed. Various intelligence reports from the mid-1970s estimated South Korea would need 3-10 years to acquire a nuclear weapons production capability.

The status of the U.S.-South Korean security alliance appears to have played a major role in Seoul’s decisions regarding its nuclear weapons program. According to the CIA, Pak questioned the U.S. commitment to defend South Korea after events such as President Richard Nixon’s decision to reduce the number of U.S. troops in South Korea. These concerns motivated Pak to begin the weapons program, the CIA said.

According to the 1978 assessment, Pak believed that the United States would eventually tolerate a nuclear-armed South Korea. He arrived at this conclusion after observing Washington’s continued bilateral assistance to Israel even after it became known that the latter had nuclear weapons.

Pak decided to end the program after determining that it was a “major irritant” in U.S.-South Korean relations. However, South Korea showed signs after 1976 that it was keeping open its nuclear weapons options. These signs included the then-authoritarian regime’s tolerance of public discussions favoring nuclear weapons, as well as research and development of high explosives, which are used in implosion-type nuclear weapons.

The CIA identified Seoul’s confidence in the “reliability of the U.S. security commitment” to the country as “the most important factor” in restraining South Korea from resuming its nuclear weapons program. One of Seoul’s aims was likely to deter the United States from withdrawing its troops from South Korea, a measure President Jimmy Carter considered.

The CIA also noted in 1978 that South Korea’s purchases of laser systems suggested that the country had a “limited” laser isotope-separation program. Such a program can produce highly enriched uranium, another explosive material for nuclear weapons.
South Korea recently revealed that it enriched very small amounts of uranium with lasers in 2000. In its 1978 report, however, the CIA said it had “no evidence” that South Korea was conducting any uranium experiments.

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