

**U.S.-ROK Nuclear Energy Cooperation from Tutelage to Partnership:  
Nonproliferation Factor<sup>1</sup>**

**Bong-Geun Jun, Ph.D.**

**Institute of Foreign Affairs and National Security (IFANS), Seoul  
Jun2030@gmail.com**

**Presented to the U.S.-ROK Workshop  
On Nuclear Energy and Nonproliferation**

**January 20, 2010  
Washington, D.C.**

**1. The Nonproliferation Factor in the US-ROK Nuclear Cooperation**

On the occasion of renewing the ROK-U.S. nuclear cooperation agreement by 2014, South Korea expresses its desire to upgrade and expand its cooperation with the United States in the peaceful use of nuclear energy beyond what had been afforded by the current 40 years-old bilateral agreement.

During the last 40 years, South Korea's nuclear R&D and industry made a progress by leaps and bounds. South Korea now has the world's sixth largest nuclear power generation program. To cope with the global climate change and rising fossil fuel prices, South Korea decided recently to double the number of nuclear power plants, from 20 to 40, by 2030. South Korea, one of the most energy resource-poor countries in the world, considers the nuclear energy as the only reliable domestic energy resource. Thus running and expanding nuclear power generation without interruption becomes one of the most critical components of South Korea's energy security.

---

<sup>1</sup> This paper is a draft for presentation and shall not be quoted without the author's permission.

South Korea's main export industries, including semiconductor, electronics, steel, shipbuilding, etc, were all greatly benefited by low priced and high quality electricity. The nuclear power generation in Korea, known for its highest levels of operation rates and safety, made that possible. So far the nuclear power generation has been successful in fueling South Korea's fast industrial growth. From now on South Korea wants to make its successful nuclear power plants new major export items. Recently United Arab Emirates became the first customer to purchase the South Korean nuclear power plants worth of USD 20 billion.

As South Korea continuously worked on expanding its peaceful use of nuclear energy in both R&D and industry, the growing needs and demands also arose for nuclear fuel cycle activities which had been prohibited for nonproliferation purposes. As the portion of nuclear power generation among the total power generation is expected to rise from current 40 to 60 percent by 2030, the economic, safe, secure and uninterrupted operation of the nuclear power becomes ever more critical to the South Korean economy and its energy security. In this connection, the economic and stable supply of nuclear fuel and the disposal and recycle of spent nuclear fuel should be dealt with the highest priority.

South Korea also participated in global efforts to develop the future nuclear energy system, comprising the 4<sup>th</sup> generation fast reactor and advanced fuel-cycle system, with an aim to meet the future energy needs.

Demands by South Koreans for nuclear fuel cycle R&D and activities for the current and future nuclear energy needs, however, have been challenged by the U.S. immediately. Korea's presumed proliferation history and low nonproliferation credentials are main reasons for the denial.

For example, recent South Korean efforts to develop pyroprocessing technology, both a part of the future nuclear fuel systems and a remedy for the current nuclear waste problem, were also challenged. In December 11, 2007 South Korea participated as the 19<sup>th</sup> member in the Global Nuclear Energy Partnership (GNEP) program led by the United States. Korea's participation in the GNEP drew criticism from American nonproliferation group.<sup>2</sup> Their basic argument is that South Korea's pyroprocessing

---

<sup>2</sup> Miles A. Pomper, "Concerns Raised as South Korea Joins GNEP", Arms Control Today, Jan/Feb, 2008; Edwin Lyman and Frank von Hippel, "Reprocessing Revisited: The International Dimension of the Global Nuclear Energy Partnership," "South Korea-

technology, once acquired, would increase its nuclear capability and even chances of its going nuclear. At the bottom of this claim lies their distrust toward South Korea's nonproliferation policies and practices.

Therefore the purpose of this paper is to examine existing claims against any forms of nuclear fuel cycle activities in South Korea and to discuss their validity. There are two groups of such claims: South Korea's proliferation tendency and its adverse consequences to the global nonproliferation regime. The paper discusses specific arguments of such cases.

## **2. FAQs on South Korea's Nonproliferation Credentials**

### **(A) History of the Nuclear Development Program in the 70s**

It has been often suggested that the South Korean government had nuclear weapons development program in place during the 1970s. Though no one was able to confirm it, there were evidences supporting such claim. If there really had been a nuclear program in South Korea during that time, however, it might have been at an early planning stage. It is also argued that its purpose was not to actually develop nuclear weapons, but to acquire a nuclear option or to simply pressure the U.S. to keep its forces in South Korea.

Based on Korea's suspected nuclear program in the 1970s, some claim that South Koreans still keeps a desire to go nuclear. In this case, they face the danger of being lured into confusing the present with the past. Why is that so?

First of all, South Korea in the 1970s was struggling to confront militarily and economically superior North Korea which persistently claimed the communization of the entire Korean peninsula. There were also frequent military attacks by North Korea, including, for example, its attack on the Blue House in 1968 by North Korean special forces.

In addition, the United States withdrawal of its forces from Vietnam and the latter's communization (1975) were a shock to all South Koreans. Security conditions were severely aggravated by the reduction of US forces in Korea and frequent claims for their withdrawal from Korea. Despite South Korea's strong opposition, President

---

U.S. Cooperation: Is Pyroprocessing Reprocessing?," Arms Control Today, April 2008.

Nixon withdrew 20,000 out of 60,000 U.S. troops from South Korea in 1971. President Carter's plan to withdraw U.S. troops also greatly contributed to strengthening President Park Jung Hee's will for self-defense.

Moreover, there was a global fad for nuclear bombs in the 1970s. In 1974, India tested nuclear explosion. South Africa, Argentina, Brazil pursued nuclear programs, and Swiss, Taiwan and many others had a nuclear development plan. In the 70s, unlike the present days, most normal countries, as many as 30 countries, considered, at least once, joining the nuclear bandwagon.

Except the three de facto nuclear powers, however, not a single 'normal' country dares to challenge the international non-proliferation regime and global market economy. South Korea as a global trading state benefits greatly by choosing not to challenge the international society and nonproliferation regime, while joining and further strengthening them. Then, how can an open and vulnerable country like South Korea with such a high global trading stake imagine going nuclear at the risk of losing all its trading and diplomatic benefits?

South Korea is by nature a trading country whose economic dependence on overseas trade reaches over 75%, an exceptionally high number among countries of similar or larger sizes. South Korea's critical national interests lie in exporting more Samsung and Hyundai products, and importing more energy and foods, never in nuclear armament that would result in instant sanctions against Korea. The lesson drawn from the North Korean case eliminated any remaining, if any, modicum of desire for nuclear armament among South. Korea is now a full-grown democratic society with an open government and active media, and is also a constitutional society that honors and abides by national and international laws of nonproliferation.

Under the current situation, the question arises as to whether it is possible for the Korean government to develop a nuclear program secretly. In the countries like Korea where the power of the press and its constituents are strongly in place along with transparent budget and the stable government structure, it is impossible to carry out a weapons program secretly.

In conclusion, we may suspect that the 'old' South Korea in the 70s with a closed and poor economy, security-first policy, fragile national security and military dictatorship might have attempted a nuclear development program. But now we have a 'new' Korea with a vibrant democracy, welfare- and trade-first policy. As if reborn as the new country, Korea now presents itself as 'global' and 'responsible' country, and

makes best efforts to contribute to international society for its peace and prosperity. If we recognize those changes in South Korea over the last four decades, the notion that Koreans might still embed its tradition and can't all together abandon its ambition of developing nuclear program must be discarded.

**[Table: Old Korea vs. New Korea]**

	Old Korea(1970s)	New Korea(2000s)
Governing Principle	Secret operation Military Dictatorship	Transparency Democracy
National Goals	National security-first "Rich state and strong military"	Welfare Economic growth Trade
Korean Economy	Poor and closed economy	Very high dependence rate Global economy
Nuclear Policy	Dual-use(nuclear development and energy)	Peaceful use of nuclear energy only Participation in and contribution to international non-proliferation regime

**(B) The 2004 Unreported Nuclear Material Separation Incident**

It was disclosed in August 2004, when the Korean government submitted to the IAEA the initial report in compliance with the newly ratified Additional Protocol, that a few scientists had conducted unreported nuclear research experiments on several occasions in a national nuclear research lab. As South Korea signed the IAEA Additional Protocol in 1999 and ratified it on February 2004, it was required to submit its initial report within six months after ratification.

While the government went ahead with fact-finding investigation, it found a few accounts of unreported nuclear research activities using undeclared nuclear materials in 1982 and 2000 respectively. The investigation also revealed that related tools were destroyed and nuclear research activities terminated after the experiments. Soon after the initial report, the IAEA sent fact-finding teams to Korea in the late August and launched the process of verifying the reported findings.

Seoul, during that time, offered the full explanation on undeclared nuclear activities through diplomatic channels to the IAEA Secretariat, Board of Governors and the

United States. Seoul also provided full cooperation to the IAEA fact-finding team. Seoul's undeclared experiment drew keen attention from the international community out of a concern that it might be the first-ever case of noncompliance to nuclear nonproliferation obligations among developed countries.

The Korean government explained the following points. First, the undeclared nuclear activities have nothing to do with systematic efforts to develop nuclear weapons, but were conducted by a few scientists out of 'scientific curiosity.' Second, related activities were terminated after the experiment and all related equipment were destroyed. Third, the activities in question were not serious enough to be called 'violation' of nonproliferation obligations. Fourth, the government would cooperate fully with the IAEA's inspection and took measures to prevent similar incidents from recurring.

The IAEA Secretariat sent fact-finding teams twice, late September and again in early November to inspect and investigate, and published a statement on November 11. The statement contained the results from the inspection and additional verification requirements on undeclared activities including isotope separation, uranium conversion and plutonium separation. The report stated that "the quantities of nuclear material involved have not been significant" and "the ROK has actively cooperated with the Agency," but said "given the nature of the activities, the failure of the ROK to report these activities on uranium enrichment and plutonium separation is a matter of serious concern."

Finally the IAEA Board of Governors decided not to refer the incident to the UN Security Council, and adopted Chairman's Conclusion instead. The Chairman's Conclusion stated that, though ROK's undeclared activities were a serious concern, the Agency praised Seoul's full cooperation with the Agency's inspection and its correction measures, and demanded that the Director General report it to the Board in an appropriate manner. With this, the incident came to an end without being referred to the UN Security Council.

The Board of Governors again approved annual safeguard implementation reports on June 2008. According to this report, the Agency verified all details over the ROK's undeclared activities and said that questions over these activities including uranium conversion and enrichment and plutonium separation were all solved. In addition, the report adopted 'Broader Conclusion,' agreeing that all nuclear materials are used for peaceful purposes in 47 member nations including South Korea. With this conclusion, South Korea's undeclared activities were settled on legal terms as well.

This 2004 incident was a wake-up call to the South Korean government and its nonproliferation policy community. Immediately after the incident, the Korean government announced ‘Four Principles on the Peaceful Uses of Nuclear Energy.’

First, the nation does not have any intention to develop or possess nuclear weapons. The government has never possessed or pursued nuclear development programs for military uses and these policies will never change.

Second, Korea will firmly maintain its principle of nuclear transparency, and it will strengthen its cooperation with the international community. The government will faithfully adhere to and implement international treaties as a signatory including the IAEA Safeguards Agreement and the Additional Protocol.

Third, Korea will faithfully abide by international agreements on nuclear nonproliferation. The government will fully comply with international nuclear nonproliferation regulations such as the NPT and Joint Declaration on the Denuclearization of the Korean Peninsula, and actively participate in international efforts, in condition that it will come up with its own measures to take strict control of nuclear materials.

Fourth, based on the trust of the international community, Korea will expand its peaceful uses of nuclear energy. Korea wants to emphasize that it is one of the top priorities for the government to use nuclear energy solely for peaceful purposes, as a country heavily dependent on the nuclear energy. The government takes the incident as an opportunity to secure greater stability for the nuclear energy and expand its peaceful uses, while trying to gain trust from the international community and enhancing transparency.

Also in order to strengthen the nuclear safeguards and control regime, the Korean government established the Korea Institute of Nuclear Nonproliferation and Control (KINAC) in July 2006.

After acquiring a ‘Broader Conclusion’ through which the IAEA guarantees full nuclear accounting and transparency in South Korea, the Korean government was well positioned to start the ‘Integrated Safeguards’ system in July 2009.

In 2004, the Korean government overhauled and strengthened its nonproliferation intuitions and practices. The UN Security Council Resolution 1540 adopted in April

2004 that called for national WMD nonproliferation and export control legislation also helped to strengthen Korea's domestic nonproliferation regime and awareness. Now South Korea is one of leading member countries among all known nonproliferation regimes, including NSG, NPT, IAEA, CTBT, PSI, etc.

On the other hand, the 2004 incident left us another policy issue for further consideration. How long can we put a lid on South Korea's current needs for nuclear fuel-cycle research? During the last forty years, South Korea's nuclear R&D and industry grew from virtually nothing to the very top level. South Korea also grew from war-impooverished country to a model democratic country with one of the most vibrant economies in the world.

### **(C) “Nuclear Sovereignty” Argument**

After the second nuclear test by North Korea in May 2009, a group of conservative politicians and media claimed the so-called “nuclear sovereignty.” The main argument for “nuclear sovereignty” was that South Korea should acquire potential for nuclear capability by pursuing enrichment and reprocessing technology. It was also argued that “nuclear sovereignty” was necessary to exert greater pressure on the US and China to denuclearize North Korea.

By the way, what do people mean by the ‘nuclear sovereignty’? First, very few, if any, argue for nuclear armament, therefore making their influence relatively limited. North Korea's decades-long nuclear development programs and its new nuclear test didn't lead to the mobilization of any serious and organized voices in South Korea for nuclear armaments. Recognizing that North Korea cannot be a match to South Korea in all respects, South Koreans are less concerned about North Korea's military attack. South Koreans, as a result, tend to leave the issue of North Korean nuclear threats to the hands of the U.S., Six-party talks and the international society.

On the other hand, there are consistent voices for owning nuclear fuel cycle technologies. Decades ago, nuclear program with nuclear fuel cycle technologies was once considered as a symbol of national prestige. “Nuclear sovereignty” argument seems to present some appeal to those who still considers the nuclear technology as national pride.

Then, there were heated debates among South Koreans about whether we need the nuclear sovereignty. The conclusion was that “nuclear sovereignty” argument was not

only incorrect but also misleading. The Korean government made its best efforts to educate the people about the global nonproliferation regime and its obligations. Now “nuclear sovereignty” argument is not heard loudly any more.

Under the NPT, South Korea does not have “nuclear sovereignty” but has “inalienable right to the peaceful use of nuclear energy.” In addition, the right to the peaceful use of nuclear energy doesn’t mean that a country can wield it unconditionally. The exercise of such right should be implemented with prudence as well as with limits for the security and welfare of mankind. The nuclear sovereignty argument, unless checked, may undermine South Korea’s sincere efforts to exercise its rights afforded by the NPT and other agreements.

It also becomes clear to all South Koreans that nuclear programs and weapons in the Korean peninsula are greater obstacles to our national goal of unification. In that regard, “nuclear sovereignty” argument would present another hindrance to our efforts to unification.

In summary, “nuclear sovereignty” fails to serve its acclaimed purposes—to strengthen national security as well as expanding peaceful uses of nuclear power. South Korea must address the North Korea’s nuclear threats by collaborating with the international community in restraining and searching for ways to roll back the latter’s nuclear program. The rationale for South Korea’s efforts to expand peaceful uses of nuclear power should not be based on the “nuclear sovereignty” argument, but on the ROK-US nuclear cooperation framework and other international nonproliferation regime.

### **3. ‘Fairness’ in the Global Nonproliferation Regime**

Since the 70s, the U.S. tried to achieve its global nonproliferation goal by preventing the further spread of the nuclear fuel cycle technology that could be diverted to producing nuclear weapons materials. When South Korea began pursuing the pyroprocessing research, the U.S. was concerned whether the Korean case would open the door for the spread of the nuclear fuel cycle technology beyond those countries that had already acquired such technology.

Is this principle of “first-come, first served” best serving to sustain the global nonproliferation? The current global nonproliferation was only a half success. In order to maintain the sustainability of and strong supports for the regime, we need to add the idea of “fairness” to the regime.

Regarding the peaceful use of nuclear energy surrounding the nuclear fuel cycle, there are two major contrasting views. First, the U.S. government's position is that this sensitive technology should not be transferred to those countries that do not possess commercial uranium enrichment and reprocessing facilities yet. This U.S. proposition is in conflict with the article IV of the NPT that guarantees the right to peaceful use of nuclear energy.

The second stance, therefore, according to the NPT article IV, considers that each state has an inalienable right to use nuclear energy peacefully, including enrichment and reprocessing.

A third midline stance sees that a more sustainable and acceptable policy for peaceful use of nuclear energy lies somewhere between those two. Even if the state has an inalienable right to peaceful use of nuclear energy, its exercise should meet international nonproliferation qualifications and conditions.

It is inevitable to regulate this right since countries like North Korea or Iran make an improper use of this article and, thus, posing nuclear and proliferation threats to international society. Thus, differential application of this right for the purpose of achieving world peace and international security must be promoted. To warrant the application of discriminatory approach to sensitive nuclear technologies, however, following criteria should be considered: First, real industrial needs of the nuclear fuel cycle; second, complete transparency in nuclear programs; third, nonproliferation reliability in policies and practices; fourth, research and development capability of nuclear energy; and fifth, international contribution and cooperation for the peaceful use of nuclear energy.

Does South Korea conform to these criteria? Among countries without sensitive nuclear technologies, South Korea is one of very few exceptional states that meets all these criteria; Korea participates in all WMD nonproliferation treaties, multilateral export control systems and fully implements all its obligations required by each; it shows real needs for nuclear energy and fuel cycle programs due to its active and ever-expanding nuclear power generation; it also shows advanced and high technological capability in all areas of modern industries, including nuclear, petrochemical, aerospace, telecommunication, bioengineering industry; South Korea is an active participant of bilateral, regional, international cooperation on nuclear energy. The world still has lingering doubt about the prospect of South Korea's going nuclear due to its past deeds, but as mentioned above, "New Korea" now stands strong

to rise above and, at the same time, shed its old image of a poor nonproliferation performer.

If subject to evaluation using these diverse nonproliferation criteria, South Korea's assessment will be higher than some of those with established enrichment and reprocessing programs. South Korea, as it duly complies with the aforementioned nonproliferation requirements and conditions, should be now treated better and allowed to participate in proliferation-resistant fuel cycle programs.

The discriminatory nature of the global nonproliferation regime was one of its weak points. If the criteria for access to the sensitive nuclear technology could comprise the objective qualification and needs, the fairness of the regime could be strengthened. This idea of guaranteeing certain level of fairness would make the global nonproliferation regime a more sustainable and authoritative one.

#### **4. Building the ROK-US Nuclear Cooperation Partnership for the Future**

South Korea depends on nuclear energy to warrant its economic growth and stable energy supply. In order to secure stable and expanding nuclear power generation in the 21<sup>st</sup> century, South Korea needs close cooperation with and supports from the United States. Especially in order to expand to the area of nuclear fuel cycle technology, the U.S. consent and support is a must. Here again, the key issue is Seoul's nonproliferation credibility.

The U.S. government yet considers South Korea not as a full-fledged partner for nuclear energy cooperation, but as a lesser partner and target for nonproliferation watch and control. For the U.S., the "nonproliferation credibility" is said to be the most critical factor in determining the level of bilateral nuclear energy cooperation. The U.S. treats countries differently and discriminately when it allows them nuclear fuel cycle activities.

Then, U.S. nuclear cooperation partners can be grouped into four: Full partnership (EURATOM, Japan), strategic partnership (India, China), vested-interest partnership (Brazil, Argentina), and limited partnership. Korea falls in the lower category of "limited partnership."

If South Korea remains in the category of limited partnership, its nuclear energy programs would have no future. Therefore Korea should first address the U.S.

concerns over South Korean nonproliferation reliability in order to elevate the ROK-U.S. nuclear cooperative relations from “limited” to “full” partnership.

The current U.S. nuclear energy policy toward Korea appears to be overshadowed by the lingering image of the “old” Korea and its history of poor nonproliferation performance. Considering the changes made in the international environment and South Korea over the last 40 years, however, the U.S. needs to update its image of Korea, followed by the development of a new nonproliferation and nuclear cooperation policy towards Korea. When South Korea was in its early stages of industrialization, the unilateral controls imposed by the United States seemed to be working quite effectively. When South Korea, however, has achieved its status as an advanced and high technology powerhouse as is now, technology control and prevention would then become an outdated nonproliferation strategy. Higher level of cooperation between the two and Korea’s voluntary regulation would be more realistic and effective options.

“New Korea” by its open and interdependent nature cannot go against the international nonproliferation regime due to its exorbitantly high level of foreign dependence as a trading country and lack of domestic energy resources. Nuclear pride is a story of the past; its prizes are diplomatic isolation and economic sanctions as shown by North Korea and Iran. All Koreans know too well that they cannot sell Samsung and Hyundai products as soon as they decide to go nuclear. They also know well that suspension of trade would push South Korean economy back into a medieval era, comparable to or worse than that of North Korea.

What ultimately keeps industrially advanced and technologically capable countries like Korea being non-nuclear is not an external intervention to cutoff sensitive technology transfers, but collaborative and voluntary nonproliferation policies. In the 70’s, the U.S. controls were effectively imposed upon Korea for nonproliferation purposes. Nowadays, however, South Korea’s own nonproliferation policy and will to comply voluntarily are keys to the effective national nonproliferation regime.

In order to improve Korea’s nonproliferation performance and reputation, however, Korea needs to further improve its nonproliferation systems: nuclear safeguards and safety system, export control regime and particularly technology control, public awareness of non-proliferation, export control regime implementation, nonproliferation and export control enforcement. We should also expand international nuclear cooperation and exchanges.

To further strengthen nonproliferation capability, Korea should contribute to building stronger and expanded nonproliferation capacity, at both national and international levels. In this regard, public outreach for nonproliferation awareness should also be expanded. Nonproliferation dialogues between the two countries at both governmental and experts level would contribute to identifying common solutions that would strengthen both energy security and nonproliferation goals. (The End)