Online Series

Japan's Capabilities to Covet Nuclear Armament

Shin Sung Tack

Visiting Fellow, KINU

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On June 20th of this year, the Japanese House of Councilors revised the Atomic Energy Basic Law, which had been enacted 34 years earlier. The purpose of Article 2 of this Law strives to "ensure the safety of nuclear power in national life and health, environmental protection and national security," but the additional provisions may indicate Japan's intent to develop nuclear weapons. In 1968, Japan announced its nuclear policy through the three non-nuclear principles to "never produce, possess or introduce nuclear weapons." Although the Atomic Energy Basic Law added the mandate that "nuclear power should contribute to national security," the three non-nuclear principles have been essentially abandoned, thus raising concerns about the use of nuclear weapons in military drills.

The debate over nuclear armament in Japan unfolded in the 1990s, both inside and outside the country. Since then, we have been paying close attention to the military use of plutonium and the production of plutonium in Japan. We have had doubts about Japan's attempt to use the plutonium they have procured along with the advanced nuclear energy technology to make weapons. In 1993, the North Korean nuclear crisis broke out, and many scholars proposed that if we cannot suppress North Korea from developing nuclear weapons, Japan will also start arming themselves. Eventually, on October 9, 2006, the North Korean nuclear test was realized, igniting the debate on nuclear armament within the Japanese political world, in which the conservative, right-winged Liberal Democratic Party (LDP) advocated for amendments to the current legislations.

Although Japan does not have nuclear weapons, they have been categorized as a country with the technological potential to possess such weapons. South Korea only has nuclear reactors to produce electricity, but Japan has a centrifuge with which one can extract enriched uranium that is used in nuclear weapons. It also has the ability to reprocess about 800 tons of spent fuel a year. In addition, Japan has the basic facilities to make uranium nuclear bombs and plutonium nuclear bombs. Japan does not necessarily have to conduct nuclear tests to develop weapons because the five nuclear countries stimulate experiments with computers. For instance, the United States has NOVA while the United Kingdom has VALCAN, which are experimental facilities used to confine inertial-laser fusion. Japan has a similar nuclear fusion experimental facility called GEKKO-XII, and as a consequence, the global community evaluates Japan as a country that is much closer to developing nuclear weapons than North Korea.

Reprocessing Facilities for Spent Nuclear Fuel

Japan has a special vested interested in the international nuclear order. Japan is recognized by the Nonproliferation Treaty (NPT) and the five nuclear powers as the only country to not only possess nuclear energy but also reprocess nuclear energy to produce plutonium. Among the countries that are not allowed to possess nuclear weapons, Japan is the only country allowed to reprocess nuclear energy and is ranked third in the world in terms of nuclear power production. On November 4, 1987, amendments to the US-Japan Nuclear Energy Cooperation Agreement were finalized, allowing Japan to extract plutonium from spent fuel for over 30 years without the need to ask the United States for consent each time. While operating the reprocessing facilities, Japan has been developing fast-breeder reactors. The country appears to be obsessed with the procurement of plutonium to the extent that it has developed new technology in order to use mixed fuel (MOX), which is a mixture of plutonium and uranium in light-water reactors.

In September 2011 of last year, a report from the Japanese Cabinet revealed that Japan currently Cabinet revealed that Japan currently Cabinet revealed that Japan currently has about 6.7 tons of plutonium domestically and 23.3 tons of plutonium in reprocessing facilities in the UK and France, the total of which is 30 tons of plutonium. Japan's technique for extracting plutonium is the best in the world. On a standard amount of 20 kilotons, the critical mass of plutonium that North Korea has with its low-grade technology is 6 kg while in contrast, has 3 kg with its advanced technology.[1] Japan now has pure weapon-grade plutonium (over 90%) with the potential to produce 10,000 nuclear bombs, which is equivalent to the ones dropped over Nagasaki.

The UK and France has commissioned Japan to reprocess spent nuclear fuel in the Tokai reprocessing plant. In addition, the Japan Nuclear Fuel Ltd. (JNFL) built a reprocessing plant in Rokkasho, Aomori Prefecture for domestic commercial use, which will commence full-scale operations in 2012. The Tokai

1) If the chain reaction of nuclear substances, like uranium and plutonium, take place within a mass that is too small, then too many neurons break through the surface, so the chain reaction ceases. Although small objects have smaller volumes, they have wider surface areas. The minimum size of a substance that can cause chain reactions is known as the "critical size" while the corresponding mass is referred to as "critical mass."

reprocessing plant will focus on technology related to the reprocessing of spent nuclear fuel, while JNFL will support the business operations in Rokkasho.

The facilities in Rokkasho, Aomori Prefecture are the first reprocessing plants for commercial use in Japan and have been constructed by JNFL. These facilities, however, have conducted active tests through chemical and uranium tests since March 2006, and they are currently at the fifth phase (also the last stage) of the active tests.[2] In an unprecedented move in December 2000, JNFL acquired spent nuclear fuel from nuclear energy plants, and among the 3,117 tons of uranium that was brought in at the end of February 2009, 425 tons are being reprocessed at the active test stage.

Thus far, JNFL has even conducted research on reprocessing and the relevant technology (especially in the Tokai reprocessing plant) with the Japan Nuclear Energy Research Institute. In the Tokai facilities, the cumulative amount of reprocessed uranium from September 1977 to September 1997, which includes test periods, is about 1,140 tons. In addition, JNFL aspires to cooperate with the Japan Nuclear Energy Research Institute in regards to the technology that was obtained through the reprocessing of spent fuel in light-water reactors and advanced converters in Fugen. The Japan Nuclear Energy Research Institute is working on research related to new reprocessing systems that is conducive to the cycle in fast-breeder reactors and attaining the goal of putting the nuclear fuel system for the fast-breeder reactors to practical use.

Uranium Enrichment Facilities

Japan possesses another category of fuel for nuclear weapons known as enriched uranium and has about 1200-1400kg as of 2011. Not all of the uranium that Japan possesses is highly enriched uranium; however, since Japan has advanced technology, it can produce nuclear weapons with just 50% of the inter-grade enriched uranium. Thus, the main problem is that Japan has the best technology in the field of enrichment, and it is already operating two large-scale uranium enrichment facilities.

The two enrichment facilities are the centrifuge plant in Ningyo-toge and the gas centrifuge plant in Rokkasho. Since 1972, the Japanese Nuclear Cycle Development Institute (former power-reactor and nuclear fuel development business) has been engaging in uranium enrichment through centrifugation in Ningyo-toge as part of a national project to build a pilot plant and establish new technology for operations and repairs through test drives. It also constructed a prototype plant that is about the production scale of 200 tons SWU per year.[3] Through 13 years of continuous operation, this facility established long-term

2) This is a comprehensive test to conduct processes by installing spent nuclear fuel in the reprocessing facilities.

3) Separative work unit (SWU) refers to the amount of natural uranium that a single centrifuge can separate into U-235 and U-238 in one year. This unit is an expression of the amount of work required for enrichment. For example, to enrich 1kg of natural 0.72% uranium into 4% uranium requires a SWU of 5.834 kg SWU. The SWU measure varies according to the uranium's level of enrichment and tails assay. Thus, the higher uranium is enriched and the lower the tails assay is, the greater the SWU becomes. During enrichment process, the enrichment ratio for a single centrifuge is so low that many centrifuges must operate together in direct and parallel connections. This is called a cascade, and the unit is usually expressed in kg SWU and

stability in the centrifuge, and it also has the record of producing about 350 tons of enriched uranium. Currently, it is seeking rights to full commercial operation.

The enrichment facility in Rokkasho, which is Japan's first enrichment factory for commercial use, has adopted gas centrifugation. JNFL was founded in 1986 in Rokkasho, Aomori Prefecture of the Kamikita District, and the construction of the facilities began in October 1988 (on July 1, 1992, Japan Nuclear Fuel Services Ltd. mergers were established in the Aomori Prefecture). JNFL began operations with the production of 150 tons SWU in March 1992 and has gradually increased productivity. By the end of March 2000, the facilities had the capability to produce 1,050 tons SWU, and they are currently operating with a scale of 1,500 tons SWU.

Ballistic Missile Technology

There is little meaning if the nuclear weapons are not used in conjunction with intercontinental ballistic missiles (ICBMs). Japan has accumulated the data needed for the development of ICBMs through OREX by experimenting with the reentry process of the missiles from the atmosphere. Japan is planning to attempt two reentry experiments this year. The M-V rocket, which utilizes solid fuel to enable immediate launch, is considered one of the best in the world.[4] This can be converted into an ICBM at any moment. In contrast to the liquid fuel rockets that North Korea is attempting to launch, Japan has the capability to launch a 16 ton satellite into low orbit around the Earth. Thus, Japan has equipped itself with all the requirements needed for nuclear armament under the guise of peace.

The 2008 "Basic Space Law" created Self-Defense Force reconnaissance satellites to be operated solely for defensive purposes, but Japan's current development of space technology indicates that they may be used for military purposes as well. In 1969, the Japanese House of Representatives assured the international community that it would uphold the "principles of peace in space," while also developing military space technology. In November 2011, China successfully docked its satellite and called upon the third world nations with much exuberance, but Japan had already succeeded in docking the H-2 rocket on its third attempt, which consisted of a target satellite and "Kiku No. 7," a satellite technology used for tracking homes. Unlike China, Japan had secretly accumulated space technology information. Space technology is a double-edged sword, as it can be used to maintain peace and for military purposes. While the satellite can observe forecasts and natural disasters, such as hurricanes, it can also take advantage of the peacetime and gather intelligence. If a country has its own rocket and the ability to launch a meteorological satellite into space, then it also has the capability to manufacture and launch an ICBM.

Japan's most impressive rocket capability is its "docking" technology. The fact that Japan has superb

tons SWU.

4) The M-V rocket is Japan's solid fuel space launch vehicle. In 1990, ISAS spent 15 billion yen in order to initiate its development. A three-stage rocket has a height of 30.7 meters, diameter of 2.5 meters and a weight of 140 tons. 2 tons of cargo can be sent up to a height of 250 km. On the M-V rocket, an 1800 kg satellite can be sent into orbit, and in 2005, the 510 kg Hayabusa landed on an asteroid.

docking expertise indicates that it has an unrivaled ability to intercept missiles in outer space. If it is tempted to do so, Japan can easily develop an ICBM, which is fired from the ground, flies through the outer space, reenters the atmosphere, and strikes the target. Therefore, it is possible to assume that the ICBM technology to reenter the atmosphere had already been established when Japan successfully launched the OREX and HYFLEX flight vehicles in February 1992 and 1996 respectively. Moreover, Japan is also highly capable of launching a rocket carrying a 6-ton satellite, meaning that it can also accommodate long-range ballistic missile technology.

Nuclear Armament Populism of the Far-right Parties

Before taking office in 1991, former Prime Minister Kiichi Miyazawa stated that "nuclear armament is technologically possible and not financially strenuous." Former Prime Minister Shinzo Abe further claimed that "the pacifist constitution does not strictly ban retention of all weapons, including nuclear weapons, if they are needed for the most minuscule manner of self-defense." Although Japan declared the "three non-nuclear principles" to ban the "production, possession and introduction of nuclear weapons" in January 1968, recent public opinions demand nuclear armament. Mayor of Osaka Toru Hashimoto, frequently touted as a rising political leader, assessed, "Nuclear armament is necessary in establishing a strong Japan." Furthermore, Governor of Metropolitan Tokyo Shintaro Ishihara, an elder representative of the far-right, claimed in an interview last January, "My condition of joining the new party is advocacy of nuclear weapon simulations" and "if not, then the simulations should at least be possible by means of a supercomputer."

There have been recent attempts at amending the pacifist constitution, the major obstacle in nuclear armament and rearmament. Some people claim that the pacifist constitution was established under American occupation and the ban against the possession of an army is an act of virtually relinquishing sovereignty. On this basis, the Liberal Democratic Party (LDP) as well as the Democratic Party of Japan (DPJ) constantly raised the issue of amending the pacifist constitution in order to make Japan a "normal state," one with a standing army. There are speculations that in the upcoming general elections in September, the majority of the seats will be taken by the LDP, who advocate for the amendment, and the "Osaka Reformation Group," a band of right-wing politicians led by Mayor Hashimoto. The political wall protecting the pacifist constitution has already collapsed due to the popular public opinion and international environment. Consequently, such conditions will allow Japan to enact constitutional amendments to establish itself as a military power with the possession of nuclear weapons.

Conclusion

Although the Japanese constitution prevents the country from becoming a military power, the Japanese Self-Defense Forces employ the third highest defense budget in the world. Furthermore, its nuclear potential is phenomenal in spite of the "three non-nuclear principles." The international community has been constantly condemning North Korea, which is believed to possess ten nuclear missiles, but Japan is capable of manufacturing thousands.

Although Japan possesses great nuclear potential, it is difficult to officially initiate nuclear armament. First, the United will not agree. Similar to South Korea, Japan is also under the nuclear umbrella of the United States due to the US-Japan Alliance. It may be possible if Japan becomes a permanent member of the UN Security Council and thereby, secure its position as a nuclear power through the NPT; however, it will be impossible to gain the support of China and Russia. Furthermore, nuclear armament in Japan will justify South Korea's nuclear development and create a domino effect throughout East Asia with Taiwan also taking part in the arms race. This is a situation that China is most wary of, so it will be prepared to stop Japan's nuclear armament at any cost. Japan can withdraw from the NPT like North Korea, but this will lead to vast criticism and economic embargos from the international community, which counters Japan's basic interests.

Thus, strong anti-nuclear movements from within Japan, a position under the US's nuclear umbrella and opposition from neighboring countries such as South Korea and China indicates that nuclear armament is not within Japan's best national security interest. It seems nominally impossible for Japan to move towards nuclear armament; however, it is not completely impossible either. The security environment of East Asia is rapidly changing, as demonstrated by Japan's amendment to the Atomic Energy Basic Law. This is a critical era in which we must seriously think about our strategic choices in guaranteeing safety and national security.