

Briefing Memorandum
Discussions regarding Nuclear Safety and Its Outlook for the Future

Sukeyuki Ichimasa
Senior Fellow, Policy Studies Department, Defense Policy Division
The National Institute of Defense Studies

Introduction:

Since the attacks upon the US of September 11, 2001, there have been “New Nuclear Threats” which the existing nuclear non-proliferation regime led by the Nuclear Non-Proliferation Treaty (NPT) cannot sufficiently deal with. Therefore, there have been a series of ongoing measures to establish new international norms and regimes to combat nuclear terrorism. In this report, “Nuclear Security” refers to prevention, detection of, and response to theft, sabotage and destruction, illegal access, illegal relocation, and other malicious activities on nuclear and other radioactive materials or related facilities. It is considered as one of the principal pillars to prevent nuclear terrorism. “Nuclear Safety” and “Safeguards” are regarded as proximity concepts to “Nuclear Security.” Actually, the basic principle “3S,” proposed by the Japanese government at the G8 Hokkaido Toyako Summit held in 2008 came from the initial letters of the three concepts. Other measures for nuclear security within multilateral frameworks include “Convention of the Physical Protection of Nuclear Material” (effective 1987, amended in 2005) and “Treaty to Deal with Nuclear Terrorism” (effective 2007), Security Council Resolution No.1540 that obligates the prevention of proliferation of weapons of mass destruction (WMD) including flows of nuclear weapons to non-state-actors, and “Global Initiative to Combat Nuclear Terrorism” proposed at the 2006 St. Petersburg G8 Summit.

Nuclear Security Summits

In 2010, the first Nuclear Security Summit (hereinafter referred to as “The Washington Summit”), proposed by United States President Obama was attended by 47 countries including India, Pakistan and Israel that are not NPT members and three international organizations. The participants made the importance of nuclear security widely known to the international community. The summit supported President Obama’s message “to secure the control of all vulnerable nuclear materials within four years.”

A communiqué was announced expressing that the states would communicate and cooperate to enhance Nuclear Security, with the basic principle that they are responsible to maintain effective Nuclear Security of all nuclear materials and nuclear facilities under their control (“Responsibility of the States”).

The Communiqué received arguments for and against from experts and NGOs. The latter were especially critical. Their criticisms included: (1) The Communiqué's scope and contents are obscure and it has no binding power, (2) It lacks specific measures for sharing information and awareness on nuclear terrorism threats, (3) It has no discussion on an agreeable base-line to regulate use of nuclear materials directly divertible to nuclear weapons (direct-use nuclear material), (4) No reference is made on regulating civilian use of high enriched uranium (HEU) and plutonium (Pu), (5) No reference is made to any specific nation or region on possible threats of proliferation of nuclear arms, and so on.

The second summit, the 2012 Seoul Nuclear Security Summit (hereinafter referred to as "the Seoul Summit"), was held in South Korea in March 2012, with the additional participation of Denmark, Gabon, Hungary, Lithuania, Romania, Azerbaijan, and INTERPOL. The summit confirmed issues such as: (1) Nuclear terrorism is one of the most challenging threats to modern international security, (2) Nuclear security has shown material progress by political commitment supported by various countries since 2010, (3) Continued efforts are required to maintain both nuclear power safety and nuclear security, noting the Fukushima nuclear power station accident in 2011.

The Communiqué encouraged the states to minimize the use of HEU, and stressed the importance of securing and preventing leakage of significant information and technology or expertise that can be used for nuclear terrorism purposes. It also sought for early entry into force of Amendment of the Convention of the Physical Protection of Nuclear Material by 2014. The Basket Proposal, a newly proposed multilateral cooperation approach (the agreement of the states with shared purposes) is worth noting. Like the agreements to terminate the use of HEU as a medical isotope (USA, France, Netherlands, and Belgium) and to promote study of low-enriched uranium at research reactors (USA, France, South Korea and Netherlands), the Basket Proposals are measures considered to be effective to further the states' political commitments under the current non-binding schemes.

At the same time as the Seoul Summit, it was widely announced that approximately 480 kgs of HEU had reportedly been eliminated from eight states since 2010 by a global effort to further strengthen nuclear security. According to the International Panel on Fissile Materials (IPFM), the global stockpile of HEU was estimated at about 1,440 tons (including approximately 20 tons in the non-nuclear weapon states), while that of weapon-grade and reactor-grade Pu altogether was around 500 tons. From the viewpoint of the risk of nuclear terrorism, experts have continually suggested the importance of accumulated and controlled storage of the direct-use nuclear material which is now spread all over the world. The issue concerned here is how the relevant states understand and apply the shared agreement of "minimizing," since all states have their respective different situations and historical backgrounds regarding the peaceful usage of HEU and Pu. In summary, issues such as strengthened political commitments and securing nuclear materials

showed certain accomplishments at the Seoul Summit, however challenges remain to answer the criticisms on the non-binding approach brought over since the Washington Summit.

“Responsibility of the States” and Approaches in the Respective States

“Responsibility of the States” regarding the above mentioned nuclear security actually relies heavily on how properly nuclear security and nuclear safety measures are implemented by the regulatory administrative agencies, security authorities, and facility operators. Reportedly the extent of popularization of nuclear security culture and ability for its implementation differs widely among the states.

The “Nuclear Materials Security Index” reported by the Nuclear Threat Initiative (NTI) drew attention among the circle of concerns before the Seoul Summit. The report used five categories to assess the 32 states with 1 kg or more of direct-use nuclear material. The categories were: (1) The number of storages of nuclear materials and the number of facilities, (2) Nuclear security and control measures, (3) Attitude towards global norms, (4) The domestic commitment and capacity on nuclear security, and (5) Societal factors including domestic political stability. Each category was evaluated by a point-addition scoring system based on open-source information. Japan’s overall ranking was 23rd, and other nuclear-advanced states like USA and France ranked a relatively low 13th and 19th, respectively, while states such as Australia, Hungary, and the Czech Republic ranked high. According to the NTI assessment guideline, Japan, USA and France ranked low because they have a large inventory of nuclear materials held at many different sites with a high frequency of transporting in and out of the states. Three negative intrinsic factors that prevented Japan from scoring points include the growing inventory of nuclear material, lack of independent regulatory authority and lack of guidelines for screening the backgrounds of security personnel.

At the Seoul Summit, the nuclear security Progress Report was reported by 49 states including Japan, considering political commitments and transparency, and information sharing. However the reports did not announce across-the-board detailed information that supports or denies the assessment based on the above mentioned NTI’s assessment.

While “Responsibility of the States” is emphasized and the progress of the states’ implementation of nuclear security is drawing international attention, in most cases, the information directly related to combat nuclear terrorism and actual implementation status tend not to be disclosed because of national security matters. Therefore it is likely that an appropriate scheme will become more important to evaluate states’ efforts objectively, and if necessary, encourage the states to make improvements.

Popularization of nuclear security culture, on the other hand, is an important factor that cannot be ignored. Furthermore, it is apparent that more global commitment is required to further ensure nuclear security and nuclear safety, not only from the viewpoint of nuclear terrorism which is a

highly critical element against global security, but also from the viewpoint of nuclear disaster, that tends to damage beyond borders. However, the nuclear summits in the past were basically attended by the states invited by the host country. Thus, participation by North Korea and Iran has not been realized yet. Inviting the states that do not conform with the nuclear non-proliferation regime to the summit might negatively affect the international norms of nuclear disarmament and non-proliferation. It is true that discussions risk being disturbed by some convinced antagonistic states as experienced in the past NPT review conferences/preparation committees. However, leaving the states with relatively low recognition and low capability of nuclear security culture uninvited may require further due consideration regarding mid-to-long term strategies, although difficult political maneuvers might be involved.

Japan's Work on Nuclear Security

In Japan's nuclear security Progress Report at the Seoul Summit, a list of contributions were stated as: (1) Development of technologies with more precision and accuracy in detection and verification in cooperation with USA, (2) Strengthening voluntary contributions to IAEA to support nuclear security programs, (3) Increase of armed personnel and enhancement of cyber security on domestic nuclear materials and nuclear facilities, and building an immediate response system for emergencies, based on the latest IAEA recommendation (INFCIRC/225/Rev.5) on the physical protection of nuclear material and facilities. These can be regarded as evidence of Japan's firmly taking steps to ensure the implementation of a high level of nuclear security, fulfilling the "Responsibility of the State."

According to a report of Advisory Committee on Nuclear Security to Japan Atomic Energy Commission, studies on tasks which require coordination of multiple government ministries are ongoing. In addition to the new domestic measures based on results of the Fukushima nuclear power station accident, a personal trustworthiness check system regarding internal threats, the task of defining responsibilities of facility operators and regulatory authorities in the event of terrorism, consideration of nuclear security from the design phase of nuclear facilities, and nuclear security while in transportation were included in the report. In 2011, Japan's Integrated Support Center for Nuclear Non-proliferation and Nuclear Security (ISCN) started working on the development of human resources and nuclear security culture, and technology for measuring and detecting nuclear materials in Asia. The United States-Japan Nuclear Security Working Group was formed and has been working in 9 areas in these 2 years. They include converting reactors to lower use of HEU and completion of down-blending, the integration of the response forces to cope with theft and sabotage at nuclear facilities. At the Seoul Summit, Japan led the discussion and made a basket proposal including a plan for joint maneuvers with the USA, UK, France, and South Korea to cope with emergencies regarding the transportation of nuclear and radioactive materials. These

should all be appreciated as signs of Japan's commitment to enhance nuclear security in the international community.

Conclusion: Outlook for the Future

While measures against "New Nuclear Threat" are progressing with the political commitments of many states, it is gradually being realized that it is necessary to develop some common understanding in the international community on what kind of world security system should be targeted with the progress of nuclear security, nuclear safety, and nuclear non-proliferation.

The Netherlands is to host the third Nuclear Summit in 2014, but according to a high-level U.S. government official, the third summit will be the last meeting to be held. However, ensuring the global nuclear material safety is still a work in progress, while the nuclear terrorism risk still definitely prevails. In relation to the comprehensive approach for firmer nuclear security measures and building a global framework for enhancing nuclear security, study of practical measures beyond the existing nuclear non-proliferation measures are urgently required. (Completed on May 2, 2012)

<Major reference materials>

- IPFM, *Global Fissile Material Report 2011: Nuclear Weapon and Fissile Material Stockpiles and Production*, January 2012.
- Matthew Bunn, et al., *Progress on Securing Nuclear Weapons and Materials*, Harvard Kennedy School Belfer Center, March 2012.
- Kelsey Davenport, "State Makes New Nuclear Security Pledges," *Arms Control Today*, April 2012.
- NTI, *Nuclear Materials Security Index: Building a Framework for Assurance, Accountability, and Action*, January 2012.
- "Strengthening of Japan's Nuclear Security Measures" by Advisory Committee on Nuclear Security, Japan Atomic Energy Commission (10th Nuclear Committee reference material No.1-1), March 9, 2012
- The Role and Business Plan of the "Integrated Support Center for Nuclear Nonproliferation and Nuclear Security" by Masao Senzaki. *Disarmament Review Vol.2*, p.5 to 9. 2011.
- The Analysis of "Nuclear Security Recommendations on Physical Protection on Nuclear Material and Nuclear Facilities" by Naoki Miyamoto. *Disarmament Review Vol.2*, p.46 to 53. 2011.