

REDUCING RISK OF NUCLEAR TERRORISM AND SPENT FUEL VULNERABILITY IN EAST ASIA



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ISAO ITABASHI

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I. INTRODUCTION

In this essay, Isao Itabashi concludes that while shortfalls in the new trustworthiness system are evident, some key improvements have been made since the Fukushima accident and that: "In the future the government must be in the lead to establish a more effective trustworthiness system by utilizing privacy information and intelligence information if it is related to securing vital facilities such as nuclear and airline industries."

Isao Itabashi is Chief of Center For Studies, Chief Analyst, Council For Public Policy, Tokyo, Japan. He is a member of the Committee on Nuclear Security, Nuclear Regulation Authority (NRA, Japan); Visiting Lecturer, National Police Academy; Visiting Professor, Musashino University; Part-Time Lecturer, Tokyo Institute of Technology; and Part-time Lecturer, Kokushikan University

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Banner image: Japanese Police Radiation Protection Bus, from [PoliceCar](#).

II. NAPSNET SPECIAL REPORT BY ISAO ITABASHI

REDUCING RISK OF NUCLEAR TERRORISM AND SPENT FUEL VULNERABILITY IN EAST ASIA

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It is my great pleasure and honor to speak at this seminar, entitled REDUCING RISK OF NUCLEAR TERRORISM AND SPENT FUEL VULNERABILITY IN EAST ASIA. And I appreciate this occasion to meet with many professionals who are at the forefront of nuclear security issues to make a safer world.

Let me first introduce myself. I conduct research on terrorism and anti-terrorism, organized crime, and crisis management at the Council for Public Policy, a National Police Agency think tank. My career in these fields stretches back roughly 30 years, during which time I have served as a member of The Committee on Nuclear Security, Nuclear Regulation Authority (NRA, Japan).

I have also served on the government committee to investigate personnel development for the ministry of land and transportation's aviation security division, in addition to the committee on counter-terrorism under the Cabinet office and Ministry of Foreign Affairs. I will talk today as a person engaged in thinking on terrorism, counter-terrorism, and nuclear security.

Fukushima Daiichi nuclear power plant accident and nuclear security

Security issues

It is well known that a severe accident occurred in the Tokyo Electric Power Company's (or TEPCO's) Fukushima Daiichi nuclear power plant on 11 March 2011 as a result from a very large

magnitude 9.0 Earthquake.

As the earthquake hit, total of ten reactors, namely TEPCO's three nuclear reactors of Fukushima Daiichi that were operational, - other three were under regular inspection -, four reactors of Fukushima Daini nuclear power plant, as well as Tohoku Electric Power Company's 3 reactors of the Onagawa nuclear power plant, automatically stopped. The all reactors of the Onagawa nuclear power plant stepped up to cold shut down condition by 1:17 hours on the 12th of March.

However, the cooling system of the Fukushima Daiichi and Daini was lost as a result of the earthquake and subsequent 14-meter tsunami, which forced the electric supply to the plants. The Fukushima Daini fortunately recovered the electric supply, and by 15th of March all four reactors were under stable condition. Yet, Fukushima Daiichi suffered from damaged fuel rods that melted down and ended up outside the reactor containment vessel in a radioactive molten mass. Accompanying accident from the damaged fuel rods was a hydrogen explosion, which literally blew up the covering structure of the reactor No.1, 3, and 4. Furthermore, the explosion as well as damaged vent (which lets pressure inside reactor be released) diffused radiation to the air.

This accident, which diffused radiation centered to Tohoku region severely affected not only socio-economically, but lives of ordinary people by forcing them to live in fear of food contamination, radiation pollution of schools and commuter routes, and experiencing planned-power outage.

As a result, nuclear power plants in Japan were put under inspection, and all plants halted their operation. As of today, only two nuclear reactors (Kyushu electric power company's Sendai nuclear power plant No. 1 reactor and Shikoku electric power company's Ikata nuclear power plant No.3 reactor) are operating.

The Fukushima nuclear accident was caused by natural disaster. But it clearly demonstrated that terrorist attack can do the same. Here I would like to outline key challenges which became clear by the experience of the Fukushima Daiichi nuclear disaster.

First, it became apparent that grave impact of nuclear disaster and its effect is clearly felt by all parties including terrorists. This accident demonstrated that nuclear disaster does have an enormously serious consequence to socio-economic life.

Next, terrorists learned from the weakness and vulnerability of the nuclear power plant that once the electric power supply is cut and remained to stop water cooling system for hours, another Fukushima Daiichi disaster can occur.

What it means is that public got to know the real weakness for attack lies in the electric supply and cooling system, instead of the central command station. In addition, we now knew that facilities for spent nuclear fuel storage that includes pool are also vulnerable.

This means that terrorists have more options for attack in terms of targets, methods, and its easiness. Hence, we are forced to reassess and reconsider existing security measures against terror attacks, and strengthen anew to secure nuclear power plants.

Another concern is that the media coverage of the accident released photos, videos, and structures of the power plant publicly. As a result of the accident, previously protected the blueprint design of the plant was shared widely on internet. We need to remind ourselves that there are not significant differences of the blueprint among nuclear power plants. The issue is that terrorists can easily obtain such detailed information as they are available on internet.

The accident also revealed that security cameras, secured entry systems, and other key security

devices may become dysfunctional once the power outage occurs in the event of natural disasters or accident. We are also confronted with an issue to secure the plant under high radiation.

We now know that TEPCO did not record the workers' identity at the initial recovery phase of the accident. This means that unknown persons were allowed to enter the plant facility, and it is possible that intended criminals or someone from third-country entered that facility. Without a doubt, the issue of personal identification of workers is a serious one of security maintenance.

This demonstrates the importance of background check of all workers as part of internal security maintenance to improve the overall security of the power plant.

Japan's Nuclear Security Measures after the Fukushima Nuclear Plant Accident

The Japanese government discussed and concluded a new security measures after the IAEA Nuclear Security Series Recommendations.

Fundamental Approach to Ensuring Nuclear Security

Japan Atomic Energy Commission (JAEC) issued its report called "Fundamental Approach to Ensuring Nuclear Security" on 13 September 2011. This report explains, as the lessons learned from the Fukushima nuclear accident, that (1) protection of facilities and structures as well as necessary support organizations and materials; (2) internal security measures of the plant to prevent interference by unknown personnel; (3) strengthening training and education of facility personnel in case of emergency; (4) strengthening nuclear security measures.

Technical Working Group on Nuclear Security

Advisory Committee on Nuclear Security, Japan Atomic Energy Commission (JAEC) decided to establish a technical working group on nuclear security on 30 June 2011, three months after the accident with an understanding that a nuclear disaster can occur by both natural and intentional causes. This technical working group was tasked to discuss issues and policy responses that can be derived from the accident, and drew up a progress report "Issues Derived from the Accident at the Fukushima Daiichi Nuclear Power Plant of TEPCO" on 30 September 2011.

The progress report stated that there is an urgency to respond to the threat to nuclear power plant as the Fukushima accident showed nuclear power plant has become an easy target of the attack by terrorists. The report continues that this accident clearly demonstrates that terrorist attack can cause serious damages to society and hence it is the state responsibility to draw up a report on lessons learned to be shared widely with international community so that such lessons can be utilized for effective nuclear security. The report tasks relevant authorities and power companies to immediately implement: (1) early detection of interference; (2) deterrence of terrorist attack; (3) strengthening of resistance of protected facilities of the plant; (4) streamlining of the protective organizations; (5) mitigation measures; (6) training and evaluation systems; (7) prevention of internal threat.

Decision "Strengthening prevention measures of terrorist attack to nuclear power plants and facilities"

The Government's Headquarters for the Promotion of Measures Against Transnational Crime and Other Relative Issues and International Terrorism decided "Strengthening prevention measures of terrorist attack to nuclear power plants and facilities" on 14 November 2011. This decision required relevant authorities to implement prevention measures against internal threats based on the understanding that relevant authorities are bound to reaffirm that terrorist threat is real and

prevention of it is required, and the relevant authorities are also required to closely coordinate, collect and share information on terrorist threat and analyses in order to strengthen prevention measures against terrorist attack. In addition, the decision asks for immediate discussion on cyber attack and other new threats and providing possible prevention measures. As for strengthening measures against internal threats, the decision asks for immediate introduction of individual authentication.

Strengthening of Japan's Nuclear Security Measures

The Advisory Committee on Nuclear Security issued a report “Strengthening of Japan's Nuclear Security Measures” on 21 March 2012 after considering lessons learned and the IAEA’s recommendation documents.

The task of handling of nuclear materials and related security issues, which were initially under the responsibility of the Advisory Committee on the Physical Protection of Nuclear Material, Atomic Energy Commission, was about to be handed over to a newly established regulatory body (current Nuclear Regulation Authority), the Advisory Committee on the Physical Protection of Nuclear Material ended its existence with the release of this report.

On 19 September 2012, a half year late from the original intended date, Nuclear Regulation Authority was established. With this, the tasks of Advisory Committee on the Physical Protection of Nuclear Material were transferred to NRA.

Nuclear Regulation Authority held the first consultation meeting on nuclear security on 4 March 2013 in order to for Japan to ensure effective nuclear security implementation and its international contribution in this field. The decision to hold such meeting was made on 19 December 2012.

The consultation meeting decided that it will take up the following items (1), (5), and (6) from (1) introduction of authentication system, (2) streamlining organizational structure (clear responsibilities), (3) ensuring security from the blueprint stage, (4) fostering culture of nuclear security, (5) security of transportation, (6) radiation materials and storage facility security, (7) detection of security breach and response, (8) ensuring security of nuclear materials that are outside of the secure facility.

Internal threat and authentication system

Nuclear security issue in both domestic and foreign areas

We usually assume that the use of nuclear weapon, attack on nuclear facilities and occupation, attack on nuclear material transportation (on seas, air or land), use of dirty bomb and RDD (radiation dispersal devices) to disperse nuclear material are the key methods of terrorist attack, but we shall also include attack on and intrusion into nuclear facilities and theft of nuclear materials as the subject matter of nuclear security.

The following examples are not terrorism act, but Japan experienced theft and dispersion of nuclear materials:

- In June 1997, a technician working for Osaka University’s genome information research center stole nuclear material and dispersed within the center.
- In December 2000, Japan Tabaco company’s medical research center in Takatsuki city in Osaka stole and dispersed iodine 125 at the Takatsuki JR train station.
- In April 2008, an employee of a company in Ichihara city, Chiba, stole iodine 125 from its storage

house.

- In September 2007, it was reported that a platinum plate (about 2 kg) had been stolen from Chubu Electric power company's Hamaoka nuclear power plant.

All these incidents were done by someone internal to respected organization.

Regarding Fukushima plant's accident, we know that workers at the site immediately after the accident were not properly scrutinized, in March 2011 a right wing group entered the Fukushima Daini power plant, and in August 2011 an internet camera of the plant widely broadcasted captured unknown person at the site.

In April 2015, a drone that carried a small amount of contaminated soil from Fukushima landed at the roof of the Prime Minister's office. The suspect's blog listed photos related to the security of Sendai and Genkai nuclear power plant.

The followings are incidents overseas:

- In both August 2000 and November 2005, police preempted a terror plan to attack Lucas Heights nuclear reactor, Sydney, Australia.
- In December 2001, activist from Greenpeace occupied the Lucas Heights nuclear reactor, Sydney, Australia.
- In November 2007, Pelindaba nuclear research center, South Africa was attacked.
- In October 2009, a French national of Algerian origin working at the European Organization for Nuclear Research (CERN) was arrested on the suspicion that the person was affiliated with Al-Qaeda in Islamic Maghreb.
- In March 2010, a suspect arrested in Yemen was an employee at a nuclear power plant in New Jersey.
- In July 2011, a suspect of multiple terror attacks (Oslo city hall attack and Utoya attack) called on right wing organization in UK to attack nuclear power plant in UK.
- In May 2012, an activist from Greenpeace parachuted into a nuclear power plant in Bugey, France.
- In July 2013, Greenpeace activists broke into a nuclear power plant in Tricastin, France.
- It was reported that a suspect of Brussel attack in March 2016 had planned an attack on nuclear power plant, and had video footage of executive of the nuclear power plant.

As shown above, incidents related to nuclear materials are carried out by personnel inside. Most incidents occurred in Japan are carried out by own employees, and in France, authorities are hunting down suspects within nuclear research circle for affiliating with terrorist groups. This shows that it is essential to ensure security measures within nuclear facilities.

Terrorism threat internal to nuclear facilities

A well-known method for successful terrorism is to foster terrorists who had been within target groups. In the 1970s, aircraft hijack was often carried out by perpetrating the airline and related industry companies and by threatening employees to cooperate in order to hide weapons within the aircraft.

Indonesia suffered from multiple attacks over four years by Jemaah Islamiyah in 2002 (in Bali), 2003

and 2004 (in Jakarta), in 2005 (again in Bali), but it had not seen such large scale terrorist attacks during 2006-2008. However, the attack to Ritz Carlton hotel in Jakarta on 17 July 2009 happened as a result of, among others, cooperation of a gardening company employee who could enter the hotel. This incident shows that the terrorists was in preparation with the personnel inside the target.

In another well-known instances, FBI arrested three workers at the JFK airport in June 2007, and Japanese terrorist organization Oom Shinrikyo infiltrated software company by sending its members.

Furthermore, in January 2013, reportedly there was internal supporters in the terrorist incident of In Amenas natural gas plant in Algeria where many foreigners including ten Japanese fell victim.

There are cases of terrorists pretending to be contractor of the target facility, or of terrorists threatening employees of the facility. It is common to see such internal supporters over a few years to a decade while working diligently to gain trust from co-workers and rise to a position of importance to have access to key information and facilities.

Japan's discussion process to ensure policies tackling internal threat

Tackling internal threat is to authenticate employees beforehand. ICAO and IAEA provides rules to ensure such action, and in nuclear security field, IAEA gives such recommendation. Although such authentication (or ensuring "trustworthiness checks") is required internationally due to the critical importance of securing nuclear material, Japan's policy in this field lags behind the international standard.

IAEA's guideline issued in June 1999 recommends trustworthiness checks (INFCIRC/225 Rev.4), and succeeding January 2011 guideline (INFCIRC/225 Rev.5) recommends the government, in addition to nuclear provider, to be part of this process. Trustworthiness check process had not been introduced in Japan, and in light of the Fukushima accident, it is urgent for the government to implement a policy of trustworthiness checks.

The Action Plan to prevent terrorism issued in December 2004 had identified the importance of trustworthiness checks as the IAEA's guideline of June 1999 recommended.

Ministry of Economy, Trade and Industry's Resource and Energy Research committee set up a working group on crisis management in January 2005, which discussed the internal threat and issues relating to trustworthiness checks. In its report, suggestions were made which included the importance to gain public support for limiting certain civil rights, and a necessity to balance between public security concerns of nuclear facilities and that of other industries. The report concluded to continue to discuss trustworthiness system across different industries and introduction of trustworthiness system at the present system, while implementing design based threat.

Ministry of Education, Culture, Sports, Science and Technology (MEXT) discussed the same issue in 2005 and concluded that a careful further consideration is necessary to gain public support and to find legal basis for trustworthiness policy.

In essence, these two Ministries postponed the decision with note to mention further discussion is necessary.

After the Fukushima accident, Nuclear Regulation Authority recommended that relevant authorities and nuclear industries must endeavor to minimize internal threat to its facilities, and in its report "Fundamental Approach" in March 2012 the NRA demanded the early introduction of concrete steps toward trustworthiness checks that is the responsibilities of not only relevant authorities and industries but law enforcement agencies. Furthermore, NRA expected that a third-party checks and

handling of privacy information will need to be carried out by the government authorities.

I believe that involving the government authorities in handling privacy information is the right approach because it is unavoidable to handle privacy information and is in line with IAEA recommendation (INFCIRC/225 Rev.5).

Trustworthiness Checks in Japan

As mentioned above, the tasks of Advisory Committee on the Nuclear Security, Japan Atomic Energy Commission, were transferred to NRA on 19 September 2012. On 4 March 2013, NRA held the first meeting of nuclear security committee meeting.

The discussion on trustworthiness systems was carried out by a working group on privacy information set up under the committee, and the working group held the first meeting on 24 January 2014. The working group spent 1 year and 9 months to conclude with a report, and gave a policy direction.

This working group initially discussed a possibility to provide new legal framework for NRA to become core agency for trustworthiness system, but in the end, it concluded that existing law can be amended to include framework for trustworthiness system, and respected industries become the core institution for the implementation. In addition, it was decided that employment seekers must declare its privacy information for third-party checks, provide public certification documents, and industry needs to conduct interviews and fit-and-proper assessment.

NRA made a decision on 21 October 2015 based on the working group conclusions. Relevant laws and regulations were amended on 21 September 2016. The new trustworthiness system provides following*

Target facilities

- Nuclear fuel reprocessing facility
- Nuclear reactors for electric generation
- Nuclear reactors for research
- Specifically designated nuclear reactors (Fukushima Daiichi)

Target personnel

- Employees and others who enters the facility regularly
- Employees and others who may have access to protected information

Validity Duration

- Maximum five years

Items for check

- Full name
- Date of Birth
- Nationality

- Resident address
- Institution
- Education
- Job history
- Work experiences at nuclear facilities
- Overseas experience and travel records
- Criminal history
- Guardianship Registration
- Bankruptcy history
- Mental illness medical history
- Alcohol and drug abuse history
- Declaration that no affiliation to foreign groups to disrupt order
- Declaration that no affiliation to terrorist and/or criminal groups
- Declaration that truthfulness and pledge to abide by law and confidentiality
- Interviews will be conducted

Conclusion

Although there are some shortfall in the new trustworthiness system, I must conclude that key steps have been taken.

The importance is to improve the system by doing, and this spirit is expressed in the above-mentioned working group report as: "It is necessary to improve the new trustworthiness system's effectiveness during implementation. This working group believes that a more fundamental discussion is necessary with the government leadership to debate the necessity to assess trustworthiness of individuals for the sake of securing our country as part of counter-terrorism measures."

I believe that in the future the government must be in the lead to establish a more effective trustworthiness system by utilizing privacy information and intelligence information if it is related to securing vital facilities such as nuclear and airline industries.

III. NAUTILUS INVITES YOUR RESPONSE

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Nautilus Institute

2342 Shattuck Ave. #300, Berkeley, CA 94704 | Phone: (510) 423-0372 | Email:

nautilus@nautilus.org