

— Tentative Translation —

Strengthening of Japan's Nuclear Security Measures

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Strengthening of Japan's Nuclear Security Measures

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INTRODUCTION

Nuclear security has become a matter of international interest, with various international discussions and initiatives taking place. In the 1980s, concern over nuclear security focused on the protection of nuclear materials during international transport, but there has recently been growing concern over terrorist attacks using nuclear explosive devices and devices which disperse radioactive materials. This comes amid an increase in alarming incidents such as the unauthorized removal of nuclear materials from nuclear facilities in Russia following the collapse of the Soviet Union, and the terrorist attacks on September 11, 2001 in the U.S. Ensuring Nuclear security, including the physical protection of not only nuclear materials but also other radioactive materials, has increasingly become an issue the global community must tackle. One example is the recent confirmation of the requirements for enhanced nuclear security measures in the 1st Nuclear Security Summit held in Washington in April 2010, following a call by President Obama. The 2nd Nuclear Security Summit will be held in Seoul, ROK in March 2012. As a member of the global society, Japan must also strengthen its national nuclear security, and strive as part of international efforts to improve global nuclear security.

Under these circumstances, the IAEA has been creating four-level IAEA Nuclear Security Series documents, Nuclear Security Fundamentals¹ (ranked 1st, with the final draft pending approval), three sector-specific Recommendations² (issued in January 2011), Implementing Guides, and Technical Guides to support the development and strengthening of the nuclear security regime of member states.

1 Fundamentals: "Fundamentals of a State's Nuclear Security Regime: Objectives and Essential Elements" (draft); for English and temporary translation texts, refer to the reference data at the Advisory Committee on Nuclear Security, Atomic Energy Commission (21st meeting).

(English) <http://www.aec.go.jp/jicst/NC/senmon/bougo/siryobougo21/bougo-si21.htm>

(Japanese draft) <http://www.aec.go.jp/jicst/NC/senmon/bougo/siryobougo22/siryos2.pdf>

2 Three sector-specific recommendations: Nuclear Security Recommendations on Physical Protection of Nuclear Material and Nuclear Facilities (INFCIRC/225/Revision 5), Nuclear Security Recommendations on Radioactive Material and Associated Facilities, and Nuclear Security Recommendations on Nuclear and Other Radioactive Material out of Regulatory Control. Refer to IAEA documents for English texts, and the reference data at the Advisory Committee on Nuclear Security, Atomic Energy Commission (26th meeting) for the temporary translation version.

(English) <http://www-pub.iaea.org/books/IAEABooks/Series/127/IAEA-Nuclear-Security-Series>

(Japanese draft) <http://www.aec.go.jp/jicst/NC/senmon/bougo/siryobougo26/bougo-si26.htm>

This Advisory Committee on Nuclear Security began studying nuclear security in 2007 in light of the international nuclear security circumstances, and issued a report titled “Fundamental Approach to Ensuring Nuclear Security (Fundamental Approach)” in September 2011 based on the “Fundamentals of a State's Nuclear Security Regime (draft)” of the IAEA Nuclear Security Series documents.

The Advisory Committee also founded a technical working group in June 2011 to study the IAEA recommendation papers, which are second level documents following “Fundamentals,” from technical and expertise perspectives, reflecting the need for clear policies ensuring nuclear security in Japan based on IAEA recommendations, and the response to nuclear security issues following the accident at the Fukushima Dai-ichi Nuclear Power Plant (hereinafter referred to as the” NPP”) .

The working group initially discussed ways to tackle the issues derived from the accident at the Fukushima Dai-ichi NPP, then studied three IAEA recommendations. Based on the results of this study, the Advisory Committee examined the reinforcement of nuclear security in Japan ,and made this report Part II of this report” Issues Derived from the Accident at the Fukushima Dai-ichi Nuclear Power Plant of TEPCO” consists of the contents of the progress report and its addition which describes present dealing situation of regulatory bodies. The progress report was presented by the Advisory Committee to the Atomic Energy Commission in November 2011 as a progress report titled “Corresponding to tasks on nuclear security based on the accident of Fukushima Dai-ichi NPP.”

The Advisory Committee expects the organizations or persons that obtained government license ((hereinafter referred to as the” licensees”)) and the related administrative bodies, including regulatory bodies and security authorities, to discuss and implement practical measures immediately³ based on this report.

The Advisory Committee on Nuclear Security was founded based on the decision made by the Atomic Energy Commission in December 2006 to study basic approaches to rational and effective means of protecting (1) nuclear materials and related facilities, and (2) high-level radioactive wastes (vitrified wastes) and related facilities, with their characteristics taken into

³ Some have already been executed.

account. Following the decision made by the Atomic Energy Commission in August 2007, the Advisory Committee was also instructed to study basic approaches to the physical protection of radioactive materials, and **review the 1980 report** of the Advisory Committee on Nuclear Material Protection of the Atomic Energy Commission from an international perspective.

Following the study and deliberation according to the founding objectives of this committee and an instruction from the Atomic Energy Commission, the Advisory Committee made two reports, **“Fundamental Approach to Methods of Protection of High-level Radioactive Wastes (Vitrified Wastes), etc. (August 2007)”** and **“Fundamental Approach to Methods of Protection of High-level Radioactive Wastes (Vitrified Wastes), etc. (the Level of Protection of Vitrified Wastes, etc. During Transport) (February 2008),”** as the results of study and deliberation of **“Fundamental Approach to the Rational and Effective Protection of High-level Radioactive Wastes (Vitrified Wastes) and Related Facilities Based on Their Characteristics.”**

The Advisory Committee's two reports, **“Fundamental Approach”** and this report **“Strengthening of Japan's Nuclear Security Measures”** are the results of study and deliberation of **“Fundamental Approach to Rational and Effective Methods of Protection of Nuclear Materials and Related Facilities Based on Their Characteristics”** and **“Review of the Report of the Advisory Committee on the Physical Protection of Nuclear Material, Atomic Energy Commission (1980).”** And We, the Advisory Committee think that these reports are the response to the instruction from Atomic Energy Commission and our duty were achieved.

PART I Strengthening of Nuclear Security based on the IAEA Nuclear Security Series Recommendations

The three recommendations in this series are titled **“Nuclear Security Recommendations on Physical Protection of Nuclear Material and Nuclear Facilities (INFCIRC/225⁴/Rev. 5)”** (**“Security Recommendations on Nuclear Material, etc.”**), **“Nuclear Security Recommendations on Radioactive Material and Associated Facilities”** (**“Security Recommendations on Radioactive Material, etc.”**) and **“Nuclear Security Recommendations on Nuclear and Other**

4 INFCIRC/225: Refer to CHAPTER 1 OF PART I.

Radioactive Material out of Regulatory Control⁵ (“Security Recommendations on Material out of Regulatory Control”).

Of these recommendations, “Security Recommendations on Nuclear Material, etc.” was issued as Revision 5 of “INFCIRC/225.” The other two recommendations were the first edition, and as mentioned in INTRODUCTION, issued in response to the recent international concern over nuclear security after the September 11 terrorist attacks in the U.S, especially nuclear threat including not only nuclear explosive devices using nuclear materials, but also devices which disperses radioactive materials (so-called dirty bomb, etc.), and unauthorized removal of nuclear materials and all other radioactive materials as those subject to nuclear security.

This Advisory Committee studied the direction of discussion and the system of implementation of the major issues in these recommendations, considering the indication of basic policies to the licensees and related administrative bodies including regulatory bodies and security authorities in their discussions on the reinforcement of nuclear security measures based on three IAEA recommendations as the role of Atomic Energy Commission. According to the results of study, the Advisory Committee expects the licensees and related administrative bodies including regulatory bodies and security authorities to cooperate closely with each other in studying and implementing the measures for reinforcement of nuclear security based on the graded approach and defence in depth, etc. indicated in the Fundamental Approach.

The IAEA recommendations are provided as the guidance for member states to take measures, and leave the adoption of individual measures and methods of embodiment to member states' discretion. It is therefore important to make an attempt in accordance with the plan shown in the meaning of The IAEA recommendations, the "Fundamental Approach ", and this report to implement the most suitable measures for Japan based on situations both at home and abroad.

CHAPTER 1 Nuclear Security Recommendations on Physical Protection of Nuclear Material and Nuclear Facilities

(1) Position and outline of recommendations

INFCIRC/225 was issued in 1972 as international guidance to be referred to by member states

⁵ out of Regulatory Control: Materials requiring regulatory control but not under the relevant control for any reason.

in establishing a physical protection regime for nuclear materials. "Security Recommendations on Nuclear Material, etc. (INFCIRC/225/Rev.5)" is the 5th Revision of INFCIRC/225. Following deliberation, it was decided to include Revision 4 and part of Revision 5 in the laws concerning nuclear security in Japan as of the end of January, 2012.

Revision 5 is compliant with the Amended Convention on the Physical Protection of Nuclear Material, which was adopted in 2005, the conclusion of which is under discussion by Japan. It is composed based on 12 basic principles of the Amended Convention, namely, A: responsibility of the state, B: responsibility during international transport. C: legislative and regulatory framework, D: competent authority, E: responsibility of the license holder, F: security culture, G: threat, H: graded approach, I: defence in depth, J: quality assurance, K: contingency plan and L: confidentiality.

In addition, based on the heightened awareness of the terrorist threat of attacks on nuclear facilities after the September 11 terrorist attacks in the U.S., Revision 5 emphasizes 1) primary responsibility of licensees for the implementation of physical protection (E: responsibility of the licensees), 2) physical protection based on results of a risk analysis (G: threat, H: graded approach, I: defence in depth), 3) expansion of measures against acts of sabotage, etc. (K: contingency plan), and 4) implementation of a physical protection regime (F: security culture, J: quality assurance, L: confidentiality) to reduce threats, mainly acts of sabotage, and prepare for terrorism.

New recommendations (measures) added to Revision 5 include "state determination of the trustworthiness policy," "consideration of nuclear security early at the site selection and design stage," "use of nuclear material accountancy and control information," "consideration of stand-off attack as a design basis threat" and "physical protection of nuclear material against sabotage during transport."

This Advisory Committee selected the following five items for discussion as mainly Cross-ministerial issue from the above new and revised recommendations:

- (a) A trustworthiness check system as the key to countering insider threats in the international community, and a long-term issue in the process of discussion of nuclear security in Japan.
- (b) The responsibilities (roles) of licensees and security authorities according to the present structure in Japan, in which armed guards are currently not normally granted to stations

within the premises of private business operators.

- (c) Consideration of nuclear security early in the stage of nuclear facility design, requiring discussion on how best to tackle newly developed and unprecedented concepts.
- (d) Protection of the protected area perimeter in terms of defence in depth.
- (e) Methods of reinforcing nuclear security during transport in response to heightened international concern over related threats.

The results of the discussion are explained in Paragraph (3).

The regulatory bodies are also investigating other new and revised recommendations in sequence. The next section presents the progress inquired on by the Advisory Committee as the present situation and future approach of regulatory bodies. Various changes were made in Revision 5, some of which have yet to be discussed, as the regulatory bodies have tackled critical issues first. This Advisory Committee expects the regulatory bodies to complete the present review and move on to the rest of items; completing the discussion of every recommendation and implementing the related measures by the 3rd Nuclear Security Summit in 2014.

(2) Present situation and future approach of regulatory bodies

(a) Nuclear and Industrial Safety Agency (NISA)

The NISA held a contingency management working group⁶ for adopting the “Security Recommendations on Nuclear Material, etc.” in domestic regulations, as the regulatory body responsible for supervising nuclear power plants, nuclear fuel processing plants, and spent fuel reprocessing facilities, etc. The objectives are to confirm major changes in Revision 5, and discuss measures against insider threats, redundancy of central alarm stations at nuclear facilities, enhancement of protection against natural disasters, including alternative means of protection, the utilization of nuclear material accountancy and control information, and physical protection of the specified nuclear fuel material during on-site transport. and at the same time, clarify security issues accompanying natural disasters and the accident at the Fukushima Dai-ichi NPP based on the Niigata-Chuetsu-Oki Earthquake and Great East Japan Earthquake, and discuss countermeasures to these issues. The results of discussion in FY 2011 are planned to be reflected in the amendment of ministerial ordinances the same fiscal year. The introduction of measures against insider threats and the trustworthiness check

⁶ Risk management working group: A working group established in the Nuclear Emergency Subcommittee of the Nuclear and Industrial Safety Subcommittee Advisory Committee on Energy and Natural Resources of the Nuclear and Industrial Safety Agency. It is not open to the public due to the nature of the study about sensitive information on nuclear security.

system is to be further discussed for the design of institutional arrangements, etc., and a certain period will be required to introduce this system. Until then, alternative interim measures such as the two-person rule, etc should be thoroughly implemented and strengthened.

The NISA also revised the Rule for the Installation, Operation, etc. of Commercial Nuclear Power Reactors (ministerial ordinances) in December 2011 based on the accident at the Fukushima Dai-ichi NPP, which requires the provision of a limited access area around the protected area perimeter to restrict access, to prevent or delay unauthorized entry into the protected area, and reinforce the protection of equipment outside the protected area, which is prone to sabotage. These measures could be valued as revised efforts, helping extend the delay time based on Revision 5. Measures against cyber terrorism are newly added in Revision 5, the revisions of which correspond to “Security Recommendations on Nuclear Material, etc.”

(b) Ministry of Education, Culture, Sports, Science and Technology (MEXT)

The MEXT, as a regulatory body responsible for research reactors and research facilities using nuclear material, held a working group⁷ in FY2011 to discuss the adoption of “Security Recommendations on Nuclear Material, etc.” into domestic measures.

The objectives include to confirm major changes in Revision 5, discuss introduction of a limited access area, redundancy of central alarm stations, utilization of nuclear material accountancy and control information, and at the same time, identify security issues accompanying natural disasters and the accident at the Fukushima Dai-ichi NPP in the Great East Japan Earthquake for prompt amendments of ministerial ordinances.

(c) Ministry of Land, Infrastructure and Transport and Tourism (MLIT)

The MLIT, as a regulatory body responsible for supervising the methods of transport of nuclear materials, examines the addition and reinforcement of individual measures in Revision 5 of “Security Recommendations on Nuclear Material, etc.,” and conducts a survey of nuclear operators, transport vessel owners, and transport business operators concerning the present transport conditions and technical viability, etc. It plans to present the survey results in a

⁷ Nuclear security working group: Provided in the Study Committee on the Research Reactor Safety Regulation Review Committee in the Ministry of Education, Culture, Sports, Science and Technology. It is not open to the public due to the nature of study about sensitive information on nuclear security.

report within FY 2011, and commence full-scale discussions on the issues based on the results.

(3) Discussions

(a) Approach to trustworthiness of individuals

(Point of Recommendations)

“Security Recommendations on Nuclear Material, etc.” suggests the risk of information leaks or sabotage by insiders, which may impair the effectiveness of nuclear security. A trustworthiness check system for individuals was recommended as a protective measure to minimize these threats. Specifically, persons handling sensitive information on nuclear materials and nuclear power plants, and persons accessing the strategic facilities and equipment should be subject to trustworthiness checks.

(Need for trustworthiness checks)

The trustworthiness check system has been discussed in Japan by the authorities, such as the Nuclear and Industrial Safety Subcommittee Advisory Committee on Energy and Natural Resources, but the system has yet to be introduced, because some pointed out that trustworthiness checks might infringe individual privacy.

Globally, however, Japan is one of few major countries using nuclear energy which has not installed a trustworthiness check system in nuclear facilities⁸, and considering the accident of the Fukushima Dai-ichi NPP, implementing measures against terrorism on nuclear facilities, which might have a serious impact on society if allowed to continue, is crucial. Discussion should get underway on installing a trustworthiness check system in nuclear related facilities subject to the IAEA Recommendations.

(Relations with Legislation for the Preservation of Secret)

An aptitude assessment of persons who are to handle special secret⁹ was proposed in the report titled “About the Legislation for the Preservation of Secret ” provided at the Meeting of Experts on the way of Legislation for the Preservation of Secret set in the Cabinet Secretariat.

8 For example, according to the nuclear security index by country published by NTI (Nuclear Threat Initiative), an NGO relating to nuclear security, in January 2012, Japan was ranked 30th of 32 countries in the Security Personnel Measures.

9 Special secret: In a report titled “About the Legislation for the preservation of secret ,” information in the fields of 1) national security, 2) diplomacy, and 3) public safety and order, which requires special

The aptitude assessment proposed in the report involves assessing individuals for the risk of leaking information or responding to external approaches, and the detailed recommendations in the report will surely be useful in the discussion of the trustworthiness check system. It should be specifically noted that this report cited the importance of agreed research into personal information for implementing an aptitude assessment system requiring the same.

At present, legislation to preserve confidentiality is under discussion, but in the field of nuclear security, the existence of nuclear materials and nuclear facilities, which are likely to be targeted by terrorists, opens up the risk of sabotage by persons who are granted access to such nuclear materials and facilities, and the trustworthiness check system should be installed regardless of the progress of legislative actions for preserving secrets, solely in light of the nature of this specific field.

(Discussion about the trustworthiness system)

Based on the requirements for installing the above system, discussions on the actual system implementation are expected in future, involving the collaboration of related regulatory bodies and the active cooperation of security authorities and other related administrative bodies. In this case, the Nuclear Safety and Security Authority should spearhead the discussion as the organization responsible for comprehensive adjustments of Japan's nuclear security policies.

The state organizations must take the initiative in the trustworthiness check system, which requires references, inquiries to third parties, and evaluation of personal information. The system design, including the assignment of roles to each organization, should take into account related domestic and overseas information. Realistic discussion is also required based on the present working environment and human resources, etc. of related regulatory bodies and security authorities. A trial operation according to guidelines may be a good idea to obtain consent from those involved.

The licensees should ensure exhaustive discussions are held between labor and management concerning issues likely to emerge in the implementation of the trustworthiness check system, and reflect the results of this discussion on the system as required. Employees of subcontractors accessing the strategic facilities and equipment are not directly employed by the licensees, and

confidentiality, is called "special secret " for convenience.

carry intrinsic risks as insiders, like the employees of the licensees accessing the strategic facilities and equipment. For this reason, the employees of subcontractors must also undergo personal checkups like the employees of the licensees when accessing the strategic facilities and equipment to ensure their trustworthiness.

Until the trustworthiness check system is implemented, the two-person rule and other interim measures that can be substituted for the same should be implemented and reinforced as described above. Though, after trustworthiness check system were implemented, it is desirable to carry out these measures if needed.

(b) Responsibilities (roles) of related organizations

(Point of recommendations)

“Security Recommendations on Nuclear Material, etc.” indicates that a clear boundary of responsibility on nuclear security measures should be defined and recorded if the organization responsible for armed response is not the licensees.

(Identification of on-site responsibilities of related organizations)

The Fundamental Approach indicates that the licensees have the primary responsibility for the implementation of nuclear security, and the security authority is the only organization which can combat armed terrorists in Japan. Based on these premises, the responsibilities of the licensees and security authority can be defined as shown in Table 1. The licensees's mandatory obligations include “detection of unauthorized access by security systems,” “report to security authority” and “delay by security system.” The security authority is responsible for armed response activities¹⁰ including “delay by the stationed police officers (stationed PO) ” and “repression by a force dispatched to the site.”

The “implementation of measures to support the security authority” is the obligation of the licensees, and defined in the form of measures to be taken by the licensees to increase the effectiveness of armed response activities based on threat assessment. The licensees are granted as a special license holder for operating nuclear power generation plants, and as a matter of course, should provide appropriate supportive measures for the armed response

¹⁰ The National Police Agency and prefectural police are assumed to take key roles in armed response activities by the stationed police officers, staffed force and dispatched forces; and the Japan Coast Guard is assumed to take the role in getting hold of terrorists escaping to the sea for backup of the security activities on land.

activities by the security authority. To fulfill their obligation, the licensees should implement the required “supportive measures” based on threat assessment in cooperation with the security authority. It should be noted that the “supportive measures” must be based on location and other site-specific features, and allow the licensees and security authority to act flexibly depending on changing circumstances, such as threat assessment, etc.

The responsibility during transport in Japan is covered in (e) Nuclear security measures during transport.

Table 1: On-site responsibilities of organizations for response to terrorism at nuclear facilities and materials

Progress	Function	Licensees	Security authority
1	Detection	- Detection of intrusion by security system - Report to security authority	- Patrol by stationed PO, etc.
2	Delay *1	- Delay by security system - Implementation of measures to support security authority*2	- Delay by stationed PO
3	Repression	- Implementation of measures to support security authority*2	- Repression by a dispatched force

*1: The aim of delay is to make start of sabotage by terrorists delay.

*2: Installation of on-site police stations for stationed PO and delivery of information to the stationed PO.

(Responsibilities among relative organizations in written form)

In general, the licensees and security authority discuss means of protection and their responsibility (role) at each site according to the site conditions, etc. in Japan. Decisions made based on their discussion are then clearly recorded in the internal manual of the licensees, and entered in the Guidelines for caution of the security authority. Thereafter, it is important for both parties to hold regular meetings to fill the gaps, if any, by sharing information, and for the security authority to give advice and instructions to the licensees, including amendments of the internal manual.

The regulatory body should supervise the licensees through an appropriate system to ensure that “supportive measures” provided by the licensees enhance the effectiveness of armed

response activities, and are reviewed and improved as required.

(c) Security-by-Design

(Point of recommendations)

“Security-by-Design” is a concept originally proposed by the U.S when Revision 5 was issued, and based on a concept similar to “Safeguards-by-Design”; whereby safeguards are taken into account as early as the design phase to achieve efficient and effective safeguards. In “Security Recommendations on Nuclear Material, etc.,” the licensees are recommended to fulfill its obligation by implementing nuclear security measures as early as the site selection and design phases when constructing a new plant for nuclear power generation.

(Situations domestically and globally)

Active discussions on Security-by-Design have got underway by nuclear security bodies in various countries since the editing of Revision 5 commenced. For example, WINS, a private nuclear security organization, held a “Best Practice Workshop for Security-by-Design” in May 2010 in Vienna, which the Japan Atomic Energy Agency (JAEA) and Japan Nuclear Energy Safety Organization (JNES) also joined.

The JAEA has conducted a joint study with Sandia National Laboratories (SNL) of the U.S. Department of Energy to draw up a handbook on Security-by-Design; assuming its use by designers of future nuclear facilities and developing nations planning to construct nuclear power plants.

However, since the nuclear security measures under consideration are classified as sensitive information for the prevention of terrorism, it is difficult to discuss practical methods of implementation, and the facility design procedures vary depending on the country. Accordingly, Security-by-Design was included in the IAEA recommendations, but some time for the discussions is needed to determine the actual methods.



(Future approach)

In light of “Security Recommendations on Nuclear Material, etc.,” international debates on nuclear security concerning site selection and design phases may also be accelerated in future. To make some contributions to international debates, and promote domestic initiatives, Japan should consider the methods of implementation based on present domestic circumstances. As a system ensuring nuclear security early on in the design phase,

Security-by-Design may be included in the licensing requirements for nuclear facilities as same as the safety measures.

The Nuclear Safety and Security Authority is expected to study the practical aspects of the methods of implementation and the ensuring system in parallel. Considering the fact that safety measures and nuclear security measures are either complementary or reciprocal¹¹ depending on the case, it is important for the relevant organizations to share information and exchange opinions to facilitate their synergy.

(d) Protection of the protected area perimeter

(Point of recommendations)

“Security Recommendations on Nuclear Material, etc.” suggest that the protection of the protected area perimeter should be designed to provide time to assess the cause of alarms and an adequate delay for an appropriate response, under all operational conditions, as one of the requirements for nuclear facilities, including nuclear power plants where any sabotage could result in serious radiological consequences.

(Extension of access delay)

The obligation to provide a limited access area in the perimeter of the protected area and reinforced nuclear security measures for the equipment, in the aforementioned amendments of ministerial ordinances by the NISA based on the accident at the Fukushima Dai-ichi NPP, resulted in the protection zone being expanded to the site boundary, thereby extending the time for entry into the nuclear facility in general.

As the protected area near the coast is generally close to the site boundary, a limited access area, or physical barriers to block (or detect) entry via sea is desired to extend the access delay, but the sea area is not included in the premises of the nuclear facility. It is, therefore, difficult to adopt equivalent security measures on the sea as those used on-site in the present legal system.

In some cases, however, the licensees were allowed to provide limited access in the area adjacent sea area and installed barriers (e.g. guard cables) following permission from the

¹¹ A complementary example is the dispersed and diversified installation of emergency diesel generators for countering natural disasters, which is also effective against acts of sabotage. A reciprocal example is that partitions in the building for limiting access as a means of countering insider threats may delay

related administrative bodies to ensure safety. The licensees could provide a limited access area based on threat assessment, in light of nuclear security and according to the use of the surface of the sea. The regulatory bodies and other related administrative bodies are expected to consider a flexible operation so that the licensees can provide nuclear security measures based on the threat assessment.

(e) Nuclear security measures during transport

(Point of recommendations)

The security measures for nuclear materials during transport used to be applied only to Category I¹² materials till Revision 4, but were extended to Category II materials from Revision 5, and new mandatory requirements were added to Category I (e.g. communications system with a scrambler). Overall, the physical protection during transport is reinforced following increasing international concern over the threat during the transport of nuclear materials.

The level of physical protection, especially against sabotage during transport, has been largely improved, measures to mitigate or minimize the radiological consequences of sabotage, and measures for physical protection of nuclear materials against sabotage are added to the Recommendations. Moreover the measures to find and retrieve nuclear materials stolen during transport are added too. The measures against sabotage and the measures to find and retrieve require contingency plans to be provided.

(Nuclear security system during transport in Japan)

In Japan, the security of nuclear materials during transport is covered by different regulatory and security authorities depending on the “means of transport” (e.g. cask), “method of transport” (e.g. truck) and “route and date.” Table 2 lists the competent ministries and agencies for land and ocean transport. For off-site transport, the licensees receive a notice indicating the method of transport based on the Design Basis Threat (DBT) during transport specified by the Ministry of Land, Infrastructure and Transport and Tourism.

access to equipment in the building and escape from the building in the event of an accident.

¹² Categorization of nuclear materials by type, irradiation and enrichment. For example, Category I includes 2 kg or more unirradiated Plutonium, 5kg or more unirradiated Uranium (235) enriched to 20% or more, and Category II contains less than 2 kg but more than 500 g of unirradiated Plutonium and less than 5 kg but more than 1 kg of unirradiated Uranium (235) enriched to 20% or more. For details, see Section 4.5 of the 5th revision “Security Recommendations on Nuclear Material, etc.”

Table 2 Competent ministries for the transport of nuclear materials

	Means of transport	Method of transport	Route and date
Land	METI (NISA) MEXT	【Off-site transport】 MILT 【On-site transport】 METI (NISA) MEXT	Local public safety commission
Ocean	MILT	MILT	Japan Coast Guard

* Air transport is excluded as it is inapplicable for nuclear materials.

METI: Ministry of Economy, Trade and Industry

NISA: Nuclear and Industrial Safety Agency

MEXT: Ministry of Education, Culture, Sports, Science and Technology

MILT: Ministry of Land, Infrastructure and Transport and Tourism

(Strengthening of measures with changes in applicable range of category)

For the addition of Category II, it is pertinent that the authorities responsible for the physical protection of nuclear materials during transport according to the “means of transport,” “method of transport” and “route and date” should tackle recommendations on the reinforcement of security measures.

(Measures against sabotage and the Measures to find and retrieve during transport)

For the discussion of nuclear security measures against sabotage during transport requiring making contingency plans, added to Revision 5, not only regulatory bodies but also security authorities and licensees should join in for close coordination. Although coordination of expertise is required to plan such measures concerning nuclear security, in reality, the organization in charge of coordination is not clearly determined, hampering promotion of the discussion about measures against sabotage and the measures to find and retrieve during transport.

A newly founded government agency, the Nuclear Safety and Security Authority, is thought to be suitable to oversee coordination about the discussion about measures against sabotage and the measures to find and retrieve during transport, because the agency will oversee coordination in relation to nuclear security, and the collection of information at home and abroad, including on-site practices.

(Responsibilities of related organizations during transport)

On-site responsibilities of organizations are defined in Paragraph (b) Responsibilities (roles) of related organizations. The organizations involved in transport vary, however, depending on the environment and conditions, coordination of organizations is desired during the above discussions on nuclear security measures against sabotage and the measures to find and retrieve.

CHAPTER 2 Nuclear Security Recommendations on Radioactive Material and Associated Facilities

(1) Position and outline of recommendations¹³

“Security Recommendations on Radioactive Material, etc.” addresses the development of a regime and measures to protect radioactive materials that may lead to radiological consequences of theft and sabotage. These recommendations were made because nuclear security has come to include all radioactive materials, following heightened concern over the threat of not only nuclear explosive devices but also devices which disperse radioactive materials. Meanwhile, radioactive materials are widely used in various fields of application including medical practices, industry and education, often in places where people are present.

These recommendations suggest practical security measures such as access control, trustworthiness checks of individuals, training and accountancy, and execution thereof according to a graded approach.

(2) Present situation of regulatory bodies

(Present situation of safety regulations)

As shown in Table 3, many laws and regulations exist concerning radioactive materials in Japan, including the Act on Prevention of Radiation Disease due to Radioactive Isotope, etc.(hereinafter referred to as "Radiation Disease Prevention Act"), Act on the Regulation of Nuclear Source Material, Nuclear Fuel Material and Reactors (Nuclear Reactor Regulation Act), Medical Care Act, Pharmaceutical Affairs Act and Veterinary Practice Act, and a number of ministries including the Ministry of Education, Culture, Sports, Science

¹³ The levels of nuclear material protection defined according to “Security Recommendations on Nuclear Material, etc.” are based on the categories of nuclear materials potentially suitable for use in manufacturing nuclear explosive devices, not on the radiological consequences of other means such as exposure or resulting disposal. Hence, the protection of nuclear materials is handled in “Security Recommendations on Nuclear Material, etc.” within the scope of potentiality for unauthorized removal or resulting exposure or dispersion.

and Technology (MEXT), Ministry of Health, Labour and Welfare (MHLW), Ministry of Agriculture, Forestry and Fisheries (MAFF) and Ministry of Land, Infrastructure and Transport and Tourism (MLIT) are involved in these laws and regulation.

Table 3 Safety laws and regulations on radioactive materials

Type	Detailed classification	Pharmaceutical Affairs Act <Production and sales of medicine > (MHLW)	Medical Care Act (MHLW)	Veterinary Practice Act (MAFF)	Radiation Disease Prevention Act (MEXT)	Nuclear Reactor Regulation Act (MEXT, NISA)	Related laws and regulations ¹⁴ <Transport > (MLIT)	
Radioactive material	Unsealed	Radiopharmaceutical	○	○	○	—	—	○ ¹⁵
		Radioisotope other than medicine	—	—	—	○	—	○
		Nuclear material ¹⁶	—	—	—	—	○	○
	Sealed	Medical equipment ¹⁷	—	—	○	○	—	○
		Radioisotope other than medical equipment	—	—	—	○	—	○
		Nuclear material ¹⁶	—	—	—	—	○	○

(Present situation of security regulations)

Based on the Code of Conduct on the Safety and Security of Radioactive Sources (IAEA, 2004), the Ministry of Education, Culture, Sports, Science and Technology established systems of 1) registration of radioactive materials that have potentially high radiological consequences to bodies (amended Enforcement Regulations 2009 for the Radiation Disease Prevention Act), and 2) prior confirmation system of exports and imports (due to the amendment of Export Trade Control Ordinance 2006).

14 Land: Regulations on the road transport of radioactive materials, Sea: Regulations for the Carriage and Storage of Dangerous Goods by Ships, Air: Civil Aeronautics Act

15 The Pharmaceutical Affairs Act rules on the surface transport of radiopharmaceuticals.

16 Nuclear security based on Security Recommendations on Nuclear Material, etc. is applied to the nuclear materials classified in Categories I to III in Section 4.5, Revision 5 of Security Recommendation on Nuclear Material, etc.

17 Medical equipment is subject to double regulation by the Radiation Disease Prevention Act and Medical Care Act, or Veterinary Practice Act.

In response to International Counter-Terrorism Conventions and Protocols, the Act on Punishment of Acts to Endanger Human Lives by Generating Radiation was enacted in Japan.

As shown in the above table, there are many regulations concerning radioactive materials, but considering the restricted number of sites handling unsealed sources that may result in radiological consequences to humans, and the fact that most radiation sources are imported, the Ministry of Education, Culture, Sports, Science and Technology is believed to have completed the nuclear security measures against radioactive materials by enacting the Radiation Disease Prevention Act for regulating sealed sources used for medical equipment.

(Response to Security Recommendations on Radioactive Material, etc.)

In the Fundamental Approach, the Atomic Energy Commission noted the consideration to minimize the effects of nuclear security on activities using radioactive materials and radiation (medical, industrial and educational fields) based on a graded approach, because 1) the extent of the damage caused by radioactive materials (excluding large sources or a lot of sources, such as a source for medical treatments) in criminal acts is significantly small compared with nuclear materials, and the degree of importance of protection is considerably low except for large radiation sources or large volumes of radiation such as those used in medical treatment, 2) the criminal acts to be blocked mainly target the prevention of dispersion of radiation during or after the theft.

Based on this Fundamental Approach as the policy responding to “Security Recommendations on Radioactive Material, etc.,” the Ministry of Education, Culture, Sports, Science and Technology will commence actual discussions for immediate results. The ministry noted the following elements to take into account in the discussions: 1) Benefits of using radioactive materials and risks in terms of nuclear security, 2) Contribution of present safety regulations to ensuring security, and 3) Inclusion of radioactive materials subject to protection in the present radioisotope registration system.

(3) Future approach

The policy of the Ministry of Education, Culture, Sports, Science and Technology is believed to be adequate and correspond to the Fundamental Approach. Thus, It is expected that actual discussions will get underway soon and nuclear security measures on radioactive materials be taken as early as possible.

As the number of sites handling unsealed sources which may be harmful to humans is limited, and the IAEA does not publish any related Implementing Guides or documents, the physical protection of unsealed sources must be discussed following the discussions of sealed sources. While the abovementioned Fundamental Approach should be taken into account, discussions should proceed in line with the current status of utilization of these unsealed sources, many of which are short half-life, and shipped and consumed for tests and other purposes immediately after production and import.

It is expected that other ministries will start discussions on nuclear security measures on radioactive materials as required.

CHAPTER 3 Nuclear Security Recommendations on Nuclear and Other Radioactive Material out of Regulatory Control

(1) Position and outline of recommendations

“Security Recommendations on Material out of Regulatory Control” was made in line with international concern over the unauthorized removal of nuclear materials from nuclear facilities in Russia after the collapse of the Soviet Union, and terrorist attacks using not only nuclear explosive devices but also devices which disperse radioactive materials after the terrorist attacks on September 11, 2001 in the U.S.

Japan, as a nation to promote the peaceful use of nuclear energy and as a member of the international community, should tackle these issues in collaboration with its peers.

The recommendations provide guidance for the development of a nuclear security regime to deter, detect and respond to terrorism using nuclear explosive devices with nuclear materials out of regulatory control, and terrorism using devices which disperse radioactive materials out of regulatory control (terrorism using nuclear material, etc.). Specifically, the recommendations focus on 1) punishment for acts of nuclear terrorism to deter terrorism using nuclear material, etc., 2) detection by instruments of nuclear materials, etc. at entry points to find terrorism using nuclear material, etc., and the detection of potential acts of terrorism by collecting and analyzing information, and 3) preparation and training of security authorities to counter terrorism using nuclear material, etc..

To ensure the integration and implementation of these measures, the recommendations also

suggest the foundation of a coordinating body or mechanism for 1) determining the priority of measures to detect and respond through threat assessment of terrorism using nuclear materials, etc., 2) coordinating measures to detect and respond, and 3) coordinating competent and security authorities responsible for taking these measures.

(2) Present situation of related administrative bodies and regulatory bodies

The aforementioned terrorism using nuclear material, etc. is usually subject to counterterrorism by security authorities in addition to terrorism using ordinary explosive devices and chemical and biological agents, and the security of this sector has been strengthened. Specifically, “improvements in entry point defence,” “improvements in the management of substances potentially used for NBC terrorism,” “improvements in information management and regulation of criminal acts,” and “improvements in the security of critical facilities and response capability” were listed in “6. Response to Terrorism Threat” of the Action Plan for the Realization of a Society Resistant to Crime 2008 (December 2008) proposed at the Ministerial Meeting Concerning Measures against Crime. The Action Plan has been followed up in time to ensure the implementation of various activities by related administrative bodies, including security authorities and regulatory bodies.

To counter international terrorism, the “International Convention of the Suppression of Acts of Nuclear Terrorism (International Counter-Terrorism Conventions and Protocols)” was concluded in 2005, and as a relevant internal measure, the “Act on Punishment of Acts to Endanger Human Lives by Generating Radiation” was enacted in 2007 in Japan to provide penal regulations for acts of terrorism and preparations for terrorism using nuclear material, etc.

As stated above, various measures aiming to prevent terrorism using nuclear material, etc. have been steadily reinforced by counterterrorism and promoted mainly by security authorities. However, a recommended body or mechanism responsible for coordinating measures against terrorism using nuclear material, etc. has yet to be founded.

Besides the counterterrorism, nuclear security involving nuclear material, etc. out of regulatory control may need to respond to the detection of radioactive material in stolen articles and waste. Local governments mainly handle such cases, supported by regulatory bodies.

(3) Future approach

Security authorities and other related administrative bodies are responsible for the majority of the aforementioned measures, mainly aimed at preventing terrorism using nuclear materials, etc. as part of counterterrorism. Regulatory bodies, including the Nuclear Safety and Security Authority, are responsible for nuclear security involving nuclear facilities and transport, etc. Regulatory bodies and atomic research and special medical institutions provide expertise and the equipment required for counterterrorism. The Nuclear Safety and Security Authority, a body to coordinate nuclear security in future, must establish the above-mentioned coordinating mechanism in consultation with the relevant regulatory and administrative authorities. As part of preparations for the occurrence of terrorism, the training and education of medical doctors and health care practitioners on medical treatment for radiation disease are also important.

Amid rising international concern over nuclear security, Japan may be asked about measures for counterterrorism, particularly nuclear security, created based on the IAEA recommendations. In this case, the Nuclear Safety and Security Authority and the Ministry of Foreign Affairs may be suitable as key organizations to present the situation using the aforementioned action plan and following-up in cooperation with security authorities.

In collaboration with security authorities and other related administrative bodies, the Nuclear Safety and Security Authority is expected to guarantee a response to the IAEA recommendations, and improve the relevant activities, especially measures for entry point defence and the detection of criminal acts as required, based on threat assessment.

PART II Issues Derived from the Accident at the Fukushima Dai-ichi NPP of TEPCO

CHAPTER 1 Progress of Discussions

The accident at the Fukushima Dai-ichi NPP made us aware that nuclear power plants could be an effective target for terrorists. Accordingly, immediate action to provide security at nuclear power plants is required based on the accident at the Fukushima plant (the accident).

Discussions are focused, therefore, on the nuclear security of such nuclear facilities (mainly commercial nuclear power plants, research power reactors and reprocessing facilities) that may have a serious impact on the surrounding areas.

The role of the Atomic Energy Commission is to present the basic policy for the activities of related organizations. Individual tasks are usually entrusted to the related organizations, but considering the urgency and importance of the issue, the Commission itself tackled part of such individual tasks in line with discussions of the related organizations.

It should be noted that CHAPTER 2 deliberately contains unclear explanations of actual physical protection for preventing the leak of sensitive information on nuclear security.

CHAPTER 2 Issues on Nuclear Security Derived from the Accident

(1) Basic recognition of nuclear security based on the accident

The accident at the Fukushima Dai-ichi NPP of Tokyo Electric Power Co., Inc. (TEPCO), following the Tohoku-Pacific Ocean Earthquake and subsequent tsunamis on March 11, 2011, caused serious damage to Japan. The effects of this accident were totally different from previous accidents. Nuclear hazards jeopardize the lives and safety of citizens, seriously contaminate the environment in which many people live, significantly impact on the national economy, and provoke social turmoil. We have learned these things from the accident.

The accident revealed the possibility that terrorism at a nuclear facility may have the same serious effects on society. It is Japan's obligation to enhance not only safety but also security of nuclear power plants based on the lessons learned from the accident, share this information with the international community, and reflect it in international efforts for reinforcement of nuclear security.

Licensees, regulatory bodies, security authorities, and other related parties should take into account the possibility of terrorism targeting nuclear facilities in implementing nuclear security measures. It is necessary for them to strengthen their security systems based on the Fundamental Approach, and at the same time, cooperate in taking effective measures when providing nuclear security.

(2) Threat of nuclear terrorism based on the accident

The following acts of terrorism at nuclear facilities should be noted based on the accident at the Fukushima Dai-ichi NPP:

(a) Increased interest in nuclear facilities

The damage resulting from the accident has been devastating, and the interest in nuclear disasters has not been restricted to the people of Japan but spread worldwide. This may also increase the interest of terrorists in this area as a target of terrorism.

(b) Equipment of nuclear facilities as effective targets of terrorism

The conventional security of nuclear facilities mainly assumes terrorism targeting the nuclear reactor and other nuclear equipment which store nuclear fuel or nuclear fuel material, and strict measures (e.g. protected areas) have been taken in these fields.

However, the accident taught us that it is important to prevent the loss of three major functions -- loss of all power supply, loss of cooling function of the nuclear reactor facility, and loss of cooling function of the spent fuel pool. The protection of all these facilities should be reinforced.

(c) Assumed acts of terrorism

In reinforcing these nuclear facilities, it should be noted that the equipment installed in the protected area and perimeters may be targeted by terrorists, and employees etc. who are authorized to access nuclear facilities may act as terrorists.

(d) Necessity of continued and improved security activity in an emergency

In line with the above (a) to (c), nuclear security in an emergency due to an accident (e.g. high radiation doses, loss of power supply etc.) should be reinforced more than ever.

(3) Issues of nuclear security at nuclear facilities

Nuclear security measures at nuclear facilities are provided by identifying the equipment to be included in nuclear security, assessing the importance of protected objects according to various risk information, and based on this assessment, designing protective measures for protected objects according to a graded approach and defence in depth (see the Fundamental Approach).

The nuclear security measurement of nuclear facilities is composed of detection, report and delay functions. Specifically, the perimeter of protected areas is equipped with sensors to detect unauthorized access at an early stage, whereupon the licensees reports such unauthorized access to the security authority as required, a fence or similar impediment

installed in the perimeter of the protected area helps delay access, and if required, the security authority goes into action for an appropriate response. To ensure the implementation of nuclear security, training and the development of a required system are also important.

An immediate response is required for the above-mentioned acts of terrorism, and equipment requiring reinforced protection is usually placed in the perimeter of the protected area. Taking these as elements of risk information, the licensees, regulatory bodies, security authorities and other parties should immediately take protective measures suitable for solving the following nuclear security issues in addition to the conventional security measures:

(a) **Early detection of intrusion**

An early detection of intrusion is essential to ensure a timely report and response. The licensees are strongly urged to install a series of intrusion detection sensors near the site boundary in addition to sensors in conventional locations (new installation, reinforcement). The regulatory bodies must provide appropriate regulations based on related laws and regulations to ensure the security measures.

As the site is narrow in Japan, discussions of improvements in intrusion detection at the perimeter of the site (land and sea) are required.

(b) **Delay against acts of terrorism**

Prevention of intrusion at the point of entry is vital to delay unauthorized access and allow for a timely report and response. In addition to conventional impediments such as fenced-off protected area, the licensees must install (or reinforce) physical barriers at the site boundary. The regulatory bodies need to provide appropriate regulations based on related laws and regulations to ensure the security measures.

Based on the situation that the site is narrow in Japan etc., the licensees and regulatory body must discuss the delay control and the roles of related organizations in line with the opinions of the security authority for each case of facilities.

(c) **Improvements in the durability of protected equipment**

The licensees are requested to improve the durability of protected equipment against terrorist attacks with explosives etc., such as the installation of covers made of rigid materials. The licensees are also requested to place protected equipment near the protected area, wherever

possible, for better protection. The regulatory bodies need to provide appropriate regulations, based on related laws and regulations, to ensure the security measures to be done.

(d) Maintenance of the protection system

The protection system are requested be perfectly maintained in ordinary operation to enable prompt report and response, and the continuous operation of nuclear security in an emergency.

So based on the installation situation of the protected facility etc., reinforcing the licensees's system (personnel, equipment, tools and materials) for the detection of unauthorized access and reporting to the security authority, and the security authority's system (personnel, equipment, tools and materials) for the response to unauthorized access is required. Continuation and reinforcement of nuclear security in an emergency (including access control methods) should also be considered when developing the security system.

Moreover the licensees and regulatory body are requested to discuss the method of protection and their roles for individual facilities according to the opinion of the security authority. Equipment required for the activity of security personnel (e.g. security room) to respond to unauthorized access is also requested to be provided.

(e) Preparations for mitigation etc.

There is a need to be prepared to mitigate the effects of terrorism according to the thought of defence in depth in the event of the destruction of a facility. In case of terrorism, prior verification of the satisfactory functioning of such preparation is also important. The licensees, regulatory bodies, security authorities and related parties must make plans for extra personnel and equipment, and for the safe evacuation of employees, the injured persons, and neighboring residents if it is difficult to combat terrorism with the existing protection system. Further, discussions involving all related organizations to form plans for mobilization and evacuation are required for information distribution and communication.

(f) Training and assessment

Periodical training and training assessments have been performed in collaboration with the licensees, regulatory body, security authority and other related parties. More practical training and closer inter-organizational collaboration are required to provide feedback on the assessment of training to protective measures, to increase the effectiveness of the

above-mentioned protection.

Comprehensive training at the nuclear facility, including the above mobilization and evacuation plans, is desired with the participation of as many related organizations as possible.

(g) Insider threat measures

There are protected facilities which may be easily accessible to employees. The licensees must enhance identity verification, body searches and personal property checks in the access control. As explained in PART I, the introduction of trustworthiness checks is to be required. Until then, interim alternative measures such as a two-person rule should be taken to increase the effectiveness of measures against the threat of insiders.

CHAPTER 3 Present Situation and Future Approach of Regulatory Bodies .

Based on the discussions at this Advisory Committee and “Strengthening of Prevention of Terrorism against Nuclear Facilities” (Decision by Headquarters for Promotion of Measures Against Transnational Organized Crime and Other Relative Issues and International Terrorism, Cabinet Office (Nov. 14, 2011)), the regulatory bodies have improved the preventive measures against terrorism targeting nuclear facilities.

The Nuclear and Industrial Safety Agency and the Ministry of Education, Culture, Sports, Science and Technology have discussed, as regulatory bodies, issues on nuclear security arising from the accident at the Fukushima Dai-ichi NPP according to “Security Recommendations on Nuclear Material, etc.” as explained in (2) of CHAPTER 1, PART I. The Nuclear and Industrial Safety Agency also amended the ministerial ordinance “The Rule for the Installation, Operation, etc. of Commercial Nuclear Power Reactors” in December 2011 to reinforce measures based on the accident at the Fukushima Dai-ichi NPP, defined the limited access area, protected facilities that may indirectly cause the leak of specified nuclear fuel material, and enforced measures against cyber terrorism.

As of January 2012, the security authorities decided to increase the number of police officers stationed on-site at nuclear facilities to increase their security, and provide the equipment and instruments required for improving the response to terrorism using explosives. Expansion of the other personnel and equipment systems as required, review of Guidelines for Caution, and

reinforcement of inter-organizational collaboration through training are currently being implemented or under discussion.

Licensees are preparing for stricter access control at the boundary of limited access areas (screening of vehicles and persons, etc.), in response to the above amendment of ministerial ordinance and with the required equipment installed in place. Improvements in nuclear security capability in the event of natural disasters, and the installation of security room on-site etc. are currently under discussion.

Moreover, a frank and lively exchange of views by those in charge of the licensees, regulatory body and security authority are required for the individual facilities to achieve a prompt response.

The licensees, regulatory body and security authority are mainly requested to discuss and steadily implement preparing mitigation measures etc., training and assessment in future. It is important to review the protection system of the licensees and security authority on a continuing basis.

CONCLUSION

Various ministries and subordinate agencies have been involved in the implementation of nuclear security in Japan, as explained early in this report. The newly established Nuclear Safety and Security Authority will integrate many such operations concerning nuclear security to strengthen the security system. Explicit integration of the planning and coordination of regulatory operation and policies following system enhancement is an important step forward in the field of security, in which information from the site of executing various measures is especially vital. While many organizations, including security authorities, are involved in counterterrorism, a national regime for coordinating the tasks of the Nuclear Safety and Security Authority, which integrates many nuclear security related operations, and those of other organizations is required to counter terrorism using nuclear materials, etc. out of regulatory control. The related organizations are expected to strive to make this regime function properly, and the Nuclear Safety and Security Authority and the subordinate Nuclear Safety Investigation Committee are expected to take leading roles.

While the system of operation relating to nuclear security is undergoing refurbishment, The role of Advisory Committee will also be transferred to the Nuclear Safety and Security Authority. Taking this opportunity, the Advisory Committee presented the major themes of nuclear security in Japan, and strove to propose the direction and system of its discussions, with issues including trustworthiness checks, to be discussed in implementation. In-depth and wide-ranging discussions by the related parties are expected in future to obtain public understanding and cooperation to strengthen nuclear security in Japan.

As for the international activities concerning nuclear security, support for the development of nuclear security systems for countries having introduced such systems for the first time, contribution to drawing up international guidelines are implemented. It is expected that the Nuclear Safety and Security Authority and the Ministry of Foreign Affairs will take the initiative in future to promote such systems in cooperation with the related authorities.

The licensees and related administrative bodies responsible for nuclear security, including individuals who belong to relevant organizations, should promote a nuclear security culture, and continuous reviews and improvements of nuclear security measures with recognition of responsibility. In particular, each should extend its own responsibility to fill the voids of others.

Finally, as indicated in the Fundamental Approach, the safety measures and security measures are either complementary or reciprocal, but this should produce synergy through the sharing of information and exchange of opinions among organizations, namely, the former should not hinder the latter, and vice versa. Moreover, public understanding and cooperation are vital to improve the effectiveness of nuclear security. It should be emphasized that related organizations strive to inform the public of the objectives of nuclear security at every opportunity.

(Reference 1) Members of Technical Study Working Group, Advisory Committee on Nuclear Security, Atomic Energy Commission

Members of Advisory Committee on Nuclear Security,

Atomic Energy Commission

(7th to 27th Meetings)

Chairman	Kaoru Naito	President, Nuclear Material Control Center
Members	Shigeharu Aoyama	President & CEO, Japan Independent Institute Inc.
	Toru Iida	Technical Manager, Nuclear Material Management Office, Department of Science and Technology for Nuclear Material Management, Japan Atomic Energy Agency (14th meeting -)
	Isao Itabashi	Chief Researcher of 1st Laboratory, Council for Public Policy (16th meeting -)
	Osamu Iwahashi	Full-time advisor, All Nippon Airways (16th meeting -)
	Yasushi Kawakami	Senior research counselor*, Nuclear Safety Research Association (- 20th meeting)
	Tatsuya Kinugasa	Consulting physician, Kobe Shipyard Mitsubishi Heavy Industries
	Hisashi Koketsu	Professor, Graduate School of Public Policy, University of Tokyo
	Toshiso Kosako	Radiation professor*, Graduate School of Engineering, University of Tokyo (- 25th meeting)
	Hiroyuki Takahashi	Professor, Graduate School of Engineering, University of Tokyo (26th meeting -)
	Kazuko Tojima	Journalist
	Yoshihiro Nakagome	Director*, Japan Nuclear Energy Safety Organization (- 25th meeting)
	Hideaki Yamamoto	Assistant manager, Department of Radiation Protection Nuclear Science Research Institute, Tokai Research and Development Center, Japan Atomic Energy Agency

* Title during the member of the committee

Members of Technical Study Working Group Advisory Committee
on Nuclear Security, Atomic Energy Commission

Chairman

Yoshihiro Nakagome	Director*, Japan Nuclear Energy Safety Organization (1st to 3rd meeting)
Kaoru Naito	President, Nuclear Material Control Center (4th meeting -)

Members

Shigeharu Aoyama	President & CEO, Japan Independent Institute Inc.
Toru Iida	Technical Manager, Nuclear Material Management Office, Department of Science and Technology for Nuclear Material Management, Japan Atomic Energy Agency
Isao Itabashi	Chief Researcher of 1st Laboratory, Council for Public Policy
Osamu Iwahashi	Full-time advisor, All Nippon Airways
Hironobu Unezak	Professor, Research Reactor Institute, Kyoto University
Hisashi Koketsu	Professor, Graduate School of Public Policy, University of T okyo
Keiko Sakurai	Professor, Faculty of Law, Gakushuin University

* Title during the member of the committee

(Reference 2) Topics of Discussions in Technical Study Working Group, Advisory Committee
on Nuclear Security, Atomic Energy Commission

Topics of Discussions after Decision by Atomic Energy Commission (August 2007)
Advisory Committee on Nuclear Security, Atomic Energy Commission

7th Meeting (October 24, 2007)

- 1) Main topics discussed at the Advisory Committee on Nuclear Security
- 2) Glossary such as "nuclear security"
- 3) Domestic regime on nuclear security
- 4) International trends etc. in the nuclear security of radioactive materials

8th Meeting (November 7, 2007)

- 1) Present situation of Japan on the security of radioactive materials
- 2) Regulations and security of radioisotopes
- 3) Utilization and distribution of radiation sources

9th Meeting (November 26, 2007)

- 1) Regulation system etc. relating to radioactive materials
- 2) IAEA documents for the security of radiation sources etc.
- 3) Interviews with related organizations etc.

10th meeting (December 19, 2007)

- 1) Export and import regulations in the Tariff Act
- 2) Communication in radiation related counterterrorism
- 3) Fundamental approach to the security of radioactive materials (draft)

11th meeting (February 15, 2008)

- 1) Basic approach of the protection of vitrified wastes, etc. during transport
- 2) Basic principles on the security of radiation sources

12th meeting (July 30, 2008)

- 1) Response to the theft of iridium 192 for nondestructive test apparatus
- 2) Registration system for radiation sources
- 3) Fundamental approach to the security of radioactive materials

13th meeting (December 18, 2008)

- 1) Fundamental approach to the security of radioactive materials
- 2) Overseas trends in the security of radioactive materials

14th meeting (April 16, 2009)

- 1) Progress of study on IAEA Nuclear Security Series

15th meeting (December 11, 2009)

- 1) Recent trends in nuclear security
- 2) IAEA Nuclear Security Fundamentals
- 3) The study direction of the Advisory Committee on Nuclear Security in the future

16th meeting (February 2, 2010)

- 1) Fundamental approach to nuclear security in Japan and focus of argument on future approach
- 2) Present situation of nuclear security
- 3) IAEA recommendation papers

17th meeting (March 4, 2010)

- 1) Present situation of nuclear security in Japan
- 2) IAEA recommendation papers
- 3) Fundamental approach to nuclear security in Japan and focus of argument on future approach

18 meeting (March 29, 2010)

- 1) Progress of study in the working group on the safety and security of IAEA Nuclear Security Series of Radiation Safety Regulations Review Committee
- 2) Fundamental approach to the protection of nuclear and other radioactive materials etc. in Japan

19th meeting (April 8, 2010)

- 1) Fundamental approach to the protection of nuclear and other radioactive materials etc. in Japan

20th meeting (July 29, 2010)

- 1) Recent trends in nuclear security

- 2) Progress of study on IAEA Nuclear Security Series Fundamentals and recommendation papers
- 3) Fundamental approach to the protection of nuclear and radioactive materials etc. in Japan

21st meeting (June 30, 2011)

- 1) International trends in nuclear security
- 2) Elements to be contained in the fundamental approach to nuclear security in Japan
- 3) The study direction of the committee in the future

22nd meeting (July 25, 2011)

- 1) Fundamental Approach to Ensuring Nuclear Security

23rd meeting (August 4, 2011)

- 1) Fundamental Approach to Ensuring Nuclear Security
- 2) The direction of the technical study working group of Advisory Committee on Nuclear Security

24th meeting (September 5, 2011)

- 1) Fundamental Approach to Ensuring Nuclear Security
- 2) Basic policy of the reformation of organizations, etc. concerning nuclear safety regulations
- 3) Technical study working group of Advisory Committee on Nuclear Security, Atomic Energy Commission (1st meeting)

25th meeting (October 25, 2011)

- 1) Report of "Response to nuclear security issues derived from the accident at the Fukushima Dai-ichi NPP"
- 2) Change of members of the technical study working group of Advisory Committee on Nuclear Security, Atomic Energy Commission

26th meeting (February 10, 2012)

- 1) Strengthening of Japan's Nuclear Security Measures (Technical study working group report)
- 2) Strengthening of Japan's Nuclear Security Measures (draft) (Advisory Committee on Nuclear Security report, draft)

27th meeting (scheduled in March 2012)

1) Strengthening of Japan's Nuclear Security Measures

Topics of Technical Study Working Group of Advisory Committee on Nuclear Security

1st meeting (August 23, 2011)

- 1) Points of IAEA recommendation paper, Nuclear Security Recommendations on Physical Protection of Nuclear Material and Nuclear Facilities (INFCIRC/225/Rev.5)
- 2) Issues derived from the accident at the Fukushima Dai-ichi NPP

2nd meeting (September 16, 2011)

- 1) Strengthening of nuclear security based on the accident at the Fukushima Dai-ichi NPP

3rd meeting (September 30, 2011)

- 1) Strengthening of nuclear security based on the accident at the Fukushima Dai-ichi NPP

4th meeting (November 18, 2011)

- 1) Study of IAEA recommendation paper, Nuclear Security Recommendations on Physical Protection of Nuclear Material and Nuclear Facilities (INFCIRC/225/Rev.5)

5th meeting (December 5, 2011)

- 1) Study of IAEA recommendation paper, Nuclear Security Recommendations on Physical Protection of Nuclear Material and Nuclear Facilities (INFCIRC/225/Rev.5)

6th meeting (December 26, 2011)

- 1) Study of IAEA recommendation paper, Nuclear Security Recommendations on Radioactive Material and Associated Facilities
- 2) Study of IAEA recommendation paper, Nuclear Security Recommendations on Nuclear and Other Radioactive Material out of Regulatory Control
- 3) Study of IAEA recommendation paper, INFCIRC/225/Rev.5

7th meeting (January 16, 2012)

- 1) Study of IAEA recommendation paper, INFCIRC/225/Rev.5

8th meeting (January 24, 2012)

- 1) Strengthening of Japan's Nuclear Security Measures (study of draft drawn up by the technical study working group)

9th meeting (February 3, 2012)

- 1) Response to IAEA recommendation paper, Nuclear Security Recommendations on Physical Protection of Nuclear Material and Nuclear Facilities (INFCIRC/225/Rev.5)
- 2) Strengthening of Japan's Nuclear Security Measures (study of draft drawn up by the technical study working group)

Glossary

Ocontingency plan

A predefined sets of actions for response to unauthorized acts indicative of attempted unauthorized removal or sabotage, including threats thereof, designed to effectively counter such acts or other acts of terrorism, or threats of these acts.

Odefence in depth

The combination of multiple layers of systems and measures that have to be overcome or circumvented before physical protection is compromised.

Odesign basis threat

The attributes and characteristics of potential insider and/or external adversaries, who might attempt unauthorized removal or sabotage, against which a physical protection system is designed and evaluated.

Odetection

A process in a physical protection system that begins with sensing a potentially malicious or otherwise unauthorized act and that is completed with the assessment of the cause of the alarm.

Ograded approach

The application of physical protection measures proportional to the potential consequences of a malicious act.

Onuclear security

Protection, detection and response to criminal acts or acts of deliberate violations against nuclear materials, other radioactive materials, related facilities and activities including transport.

Onuclear security culture

The assembly of characteristics, attitudes and behaviors of individuals, organizations and institutions which serves as means to support, enhance and sustain nuclear security.

Onuclear material

Uranium, thorium, plutonium and their compounds that emit high energy in the process of

atomic fission.

Oother radioactive material

Isotopes such as phosphor 32, cobalt 60 and their compounds that emit radiation, and substances other than nuclear materials that contain any of these.

Oradioactive material

Nuclear fuel materials and isotopes that emit radiation and their compounds, ingredients and substances contaminated by any of these. The nuclear source materials defined in Paragraph 3, Article 3 of the Atomic Energy Fundamental Act are excluded.

Oregulatory bodies

Mainly the Nuclear and Industrial Safety Agency, Ministry of Education, Culture, Sports, Science and Technology, and National Public Safety Commission are defined as the regulatory bodies responsible for protecting nuclear materials and related facilities, the Ministry of Education, Culture, Sports, Science and Technology, Ministry of Health, Labour and Welfare and Ministry of Agriculture, Forestry and Fisheries as those responsible for protecting other radioactive materials and related facilities, and the Nuclear and Industrial Safety Agency, Ministry of Education, Culture, Sports, Science and Technology, Ministry of Land, Infrastructure and Transport and Tourism, and local public safety commissions as those responsible for protecting nuclear and other radioactive materials during transport. When the Nuclear Safety and Security Authority is launched, the Nuclear Safety and Security Authority and National Public Safety Commission will be assigned as the regulatory bodies mainly responsible for protecting nuclear materials and related facilities, and the Nuclear Safety and Security Authority, Ministry of Land, Infrastructure and Transport and Tourism, and local public safety commissions as those responsible for protecting nuclear and other radioactive materials during transport.

ORelated administrative bodies

Mainly the National Police Agency, prefectural police, Ministry of Justice, and the Japan Coast Guard are defined as security authorities (the Ministry of Defence supports these organizations as required), the Ministry of Land ,Infrastructure, Transport and Tourism and Ministry of Finance as the entry point defence authorities (e.g. export and import), the Atomic Energy Commission, Agency of Natural Resources and Energy, Ministry of Education, Culture, Sports, Science and Technology, Ministry of Health, Labour and Welfare, and Ministry of Agriculture, Forestry and Fisheries as the authorities relating to use

of nuclear energy, the Ministry of Foreign Affairs as the diplomatic authority relating to nuclear energy, and the Atomic Energy Commission and Cabinet Secretariat as the coordinating authorities. When the Nuclear Safety and Security Authority is launched, the Nuclear Safety and Security Authority and Cabinet Secretariat will act as the coordinating authorities. The local authorities containing nuclear facilities and spots where theft, sabotage and other criminal acts or acts of deliberate violations against nuclear materials, other radioactive materials, related facilities and activities including transport are likely to occur, are also defined as the related administrative bodies.

Oresponse forces

Persons, on-site or off-site, who are armed and appropriately equipped and trained to counter an attempted unauthorized removal or an act of sabotage.

Osafeguard (activities)

Verification activities to ensure nuclear materials only to be used for peaceful purposes, not to be diverted into nuclear weapon

Ostand-off attack

An attack, executed at a distance from the target nuclear facility or transport, which does not require adversary hands-on access to the target, or require the adversary to overcome the physical protection system.

Otwo person rule

A procedure that requires at least two authorized and knowledgeable persons to be present to verify that activities involving nuclear material and nuclear facilities are authorized in order to detect access or actions that are unauthorized.

OWINS

World Institute for Nuclear Security (founded in September 2008) composed of nuclear material control experts, nuclear industry, governments, and international organizations to hold workshops to collect best practices on nuclear security and share information among nuclear security experts, and publish best practice guidelines etc.. As of June 2011, 52 nations and 650 persons and groups (e.g. private organizations, police forces, government agencies, regulatory authorities) participated in the institute, including individuals as well as the FEPC and JAEA from Japan.