Provisional Translation

Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management

National Report of Japan for First Review Meeting

September 2003
The Government of Japan

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A. Introduction

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Section A. Introduction

A. 1 Preparation of the report

This national report of Japan, submitted in accordance with the provisions of Article 32 of "the Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management", addresses the measures taken to implement each of the obligations of the Convention. The text (Sections B through K) and the annexes (Section L) of the report are prepared in accordance with "the Guidelines regarding the Form and Structure of National Reports", and the text of each Article of the Convention is reproduced in bold letters at the top of the report on the Article.

This report was prepared by the Nuclear and Industrial Safety Agency (NISA) of the Ministry of Economy, Trade and Industry (METI), the Science and Technology Policy Bureau (STPB) of the Ministry of Education Culture, Sports, Science and Technology (MEXT), and the Pharmaceutical and Food Safety Bureau (PFSB) and Health Policy Bureau (HPB) of the Ministry of Health, Labour and Welfare (MHLW), in consultation with other relevant governmental organizations, and was submitted to the Nuclear Safety Commission (NSC). In preparing the report, cooperation was obtained from the Nuclear Power Engineering Corporation, the Radioactive Waste Management and Nuclear Facility Decommissioning Technology Center and other relevant organizations. The report was also sent for comments to the Nuclear and Industrial Safety Subcommittee of the Advisory Committee for Natural Resources and Energy of METI.

A. 2 Current Status of Utilization of Nuclear Energy and its Management in Japan

The research, development and utilization of nuclear energy in Japan are conducted solely for peaceful purposes, in accordance with the provisions of Article 2 of the Atomic Energy Basic Law. The Atomic Energy Commission (AEC), established on the basis of the Law, plans, deliberates and makes decisions on national policies relating to the utilization of nuclear energy for peaceful purposes. In order to clarify the fundamentals for the utilization of nuclear energy and its development, the Commission has formulated a total of nine Long-Term Programs for Research, Development and Utilization of Nuclear Energy (Long-Term Programs) since 1956, one approximately every five years. The latest one was published in November 2000.

In line with the policy stated in the Long-Term Program, the Agency for Natural Resources and Energy (ANRE) of METI and MEXT establish implementation plans for utilization of nuclear energy for power generation and related fuel cycle activities, and utilization of nuclear energy in science and technology, respectively.

As to ensuring safety, the NSC established on the basis of the Atomic Energy Basic Law, plans, deliberates and makes decisions on policies aimed at ensuring the safe utilization of nuclear energy.
As the regulatory bodies responsible for ensuring safety within their particular area of competence, NISA of METI, the STPB of MEXT and the PFSB and the HPB of the MHLW regulate and give guidance on relevant activities. Operators of nuclear business conduct their activities under the policies and the regulations mentioned above.

(1) Current Status of Utilization of Nuclear Energy in Japan

It has been 40 years since the research, development and utilization of nuclear energy began and diverse activities are presently ongoing. An outline of the current status as of March 2003 is as follows.

In Japan, operation of the first commercial nuclear power reactor was started in 1966. Following the 1973 oil crisis, nuclear power plants were built actively, and now has a total of 55 commercial nuclear power plants are in operation or under construction, supplying more than one third of the gross electric power demand. One plant is at the decommissioning stage.
Nuclear fuel cycle facilities related to commercial nuclear power generation, including 6 enrichment and fuel manufacturing facilities, 2 reprocessing facilities, 3 disposal facilities, etc are in operation or under construction. In addition, two power reactors at the stage of research and development for the effective use of nuclear fuel material in future and 16 research reactor facilities for use in national and private institutes and universities are in operation.

Radioactive materials are now widely used in research applications and commercial activities, and various forms of radiation represent indispensable tools in state-of-the-art technologies such as microscopic observation and measurement of molecule, atom and nucleous and micro-fabrication procedures, supplying new insight into the development of science and technology. Also expanding are uses of X-rays or radioisotopes in medical diagnosis and treatment of cancer, amelioration of rubbers and plastics, sterilization of medical equipment and foodstuffs, crop breeding, etc. There are more than 5000 national or private facilities utilizing various types of radiation.

(2) Current Status of Spent Fuel Management and Radioactive Waste Management

The Law for the Regulation of Nuclear Source Material, Nuclear Fuel Material and Reactors (the Reactor Regulation Law) and the Law Concerning Prevention from Radiation Hazards due to Radioisotopes, etc. (the Radiation Hazards Prevention Law), the Medical Care Law, the Pharmaceutical Affairs Law and the Clinical Laboratory Technicians and Health Laboratory Technicians Law (the latter three are referred to hereafter as the Medical Care Law, etc.) are intended to ensure safety in the utilization of nuclear energy and radiation. The laws and their related regulations have been amended, as appropriate, as the utilization of nuclear energy and radiation expands and diversifies. The laws are consistent with one another in terms of the basics and details of radiation protection.

1) The Status of Spent Fuel Management

Within their respective areas of competence, NISA of METI and the STPB of MEXT regulate and give guidance on activities aimed at ensuring the safety of spent fuel management at reactor facilities and spent fuel reprocessing plants, based on the Reactor Regulation Law and/or the Electricity Utilities Industry Law.

Japan’s basic policy in this field is to reprocess spent fuel and make effective use of the recovered plutonium, uranium and other elements. Spent fuel generated in nuclear power reactors is sent for reprocessing after a period of on-site storage. Up till now, the spent fuel, with the exception of a portion reprocessed by the Tokai Reprocessing Facility of the Japan Nuclear Cycle Development Institute (JNC), has been reprocessed in overseas facilities. In the meantime, Japan Nuclear Fuel Ltd. (JNFL) has started constructing the Rokkasho-mura Spent Fuel Reprocessing Plant, which is to be completed by 2005. Storage of spent fuel in the plant’s storage facility began in 1999.

Interim storage of spent fuel before reprocessing allows flexibility in the nuclear fuel cycle. The Reactor Regulation Law was amended in 1999 to incorporate provisions on interim spent fuel storage, and a company is preparing for commercial operation of interim storage facilities by 2010.

2) The Status of Radioactive Waste Management

The safety of radioactive waste management is regulated either by the Reactor Regulation Law, the Radiation Hazards Prevention Law or the Medical Care Law, etc.

Within their respective competence, METI, MEXT and the MHLW regulate activities relevant to the safety of radioactive waste management.

Based on the Reactor Regulation Law and /or Electricity Utilities Industry Law, NISA of METI regulates, and gives guidance on, activities ensuring the safety of radioactive waste management in disposal facilities, power reactors, enrichment facilities, fuel manufacturing facilities and reprocessing facilities. NISA establishes regulations for each stage of licensing, design, operation and decommissioning, including emergency preparedness, giving due consideration to the importance of safety for each nuclear sector.

Based on the Reactor Regulation Law, the STPB of MEXT regulates, and gives guidance on, activities ensuring the safety of radioactive waste management in research reactor facilities and facilities using fuel material for research and development purposes. STPB also establishes regulations giving due consideration to the features and scale of each facility, as well as regulating activities aimed at ensuring the safety of facilities using radioisotopes, based on the Radiation Hazards Prevention Law.

The PFSB and the HPB of the MHLW regulate, and give guidance on, activities ensuring the safe management of radioisotope wastes produced in medical applications, based on the Medical Care Law, etc.

The basic policy of Japan in this field is that the present generations, who enjoy the benefits of nuclear energy, are obliged to do their utmost to ensure the safe disposal of radioactive waste generated in the research, development and utilization of nuclear energy, and shall invest continued efforts in proceeding disposal.
When implementing the policy, the waste producers have the primary responsibility for safe processing and disposal of the waste, and they prepare and promote plans for radioactive waste processing and disposal in consultation with other relevant organizations. Meanwhile, the government is responsible for regulating, and giving guidance to, the producers, with the aim of ensuring that waste processing and disposal are carried out appropriately and safely. In Japan, radioactive waste is classified into two categories, namely high-level waste (HLW) generated from spent fuel reprocessing and other low-level waste (LLW). The LLW is sub-classified according to origin (differences in radionuclide composition) and level of radioactivity.

3) The Status of Radioactive Waste Disposal

Concerning the disposal of radioactive waste, the AEC decides on the basic policy for disposal. Based on the policy, the NSC decides on the fundamental concept for safety regulations, upper bound of radioactivity concentration in disposal and the safety assessment of radioactive waste disposal facilities. METI and MEXT establish relevant regulations.

LLW generated in reactors, reprocessing facilities, etc., is processed and temporarily stored at these facilities and then sent to disposal facility. Disposal of some LLWs from power reactors is currently being carried out, while disposal of waste with comparatively high radioactivity is awaiting the establishment of relevant safety criteria.

Disposal of very low-level concrete waste from dismantling of the Japan Power Demonstration Reactor (JPDR) is already completed and the disposal facility was closed in 1997.
The Specified Radioactive Waste Final Disposal Act, enacted in the year 2000, established an

implementing organization for disposal of the HLW, the funds reserved for disposal, the procedure for selecting a disposal site, etc., thus facilitating disposal of HLW generated from spent fuel reprocessing.

A. 3 International Activities

As Japan’s basic policy for utilizing nuclear energy is to do it solely for peaceful purposes, the government of Japan actively contributed to the establishment of the International Atomic Energy Agency (IAEA) and has participated in its various committees, appropriately taking into account the results of deliberations at our national policy making and planning on utilization of nuclear energy. Recognizing that international cooperation is essential in ensuring safety of spent fuel and radioactive waste management, Japan has taken part in activities of the IAEA and the Organization for Economic Cooperation and Development/Nuclear Energy Agency (OECD/NEA) for information exchange and discussions on safety-related matters.

A. 4 Scope of Facilities Defined by the Legal Framework of Japan

Under the legal framework of Japan, the facilities mentioned in this report belong to various nuclear businesses, each of which has to be licensed by the Reactor Regulation Law or the Radiation Hazards Prevention Law. The overall concept for regulations is common among all businesses. In this report, discussions related to the common concept are described, and supplemented as necessary with additional observations referring to any particular businesses, thus avoiding unnecessary duplication.

In addition, the description about the Medical Care Law, etc. subsequent to Section F is omitted, since the regulation in the Medical Care Law, etc. applies to the Radiation Hazards Prevention Law correspondingly as later mentioned with Section E.

The word "processing " in this report is used meaning "any operation that changes the characteristics of a waste, including pretreatment, treatment and conditioning".

B. Policies and Practices

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Section B. Policies and Practices (Article 32, Section 1)

1. In accordance with the provisions of Article 30, each Contracting Party shall submit a national report to each review meeting of Contracting Parties. This report shall address the measures taken to implement each of the obligations of the Convention. For each Contracting Party the report shall also address its:

(i) spent fuel management policy;
(ii) spent fuel management practices;
(iii) radioactive waste management policy;
(iv) radioactive waste management practices;
(v) criteria used to define and categorize radioactive waste.

As introduced in the previous Section, the AEC has formulated a series of Long-Term Programs. Based on the policy stated therein, the ANRE of METI and MEXT are responsible for establishing implementation plans for utilizing nuclear energy for power generation and related fuel cycle activities, and for scientific and technological applications, respectively. Moreover, the NSC plans, deliberates and decides on policies aimed at ensuring the safe utilization of nuclear energy. As the regulatory bodies responsible for ensuring safety within their particular areas of competence, NISA of METI, the STPB of MEXT and the PFSB and the HPB of the MHLW regulate and give guidance on relevant activities. Operators of nuclear business conduct their activities under these policies and the regulations mentioned above.

Following are the national policies on spent fuel management and radioactive waste management as stated in the Long-Term Program, etc., as well as the implementation plans established by the Japanese government and the practices conducted by business operators.

B. 1 Spent Fuel Management Policy

The Long-Term Program states that nuclear power generation should contribute to Japan's energy supply system as an economical, stable and environmentally acceptable source of energy, and that nuclear fuel cycle technologies have the potential to further improve these aspects, allowing people to enjoy the benefits of nuclear power generation over a long period of time. Recognizing these features, and considering the geography and energy resources of the country, Japan has made it a basic policy to reprocess spent fuel and to make effective use of the recovered plutonium and uranium and other elements, while pursuing the principles of safety and nuclear non-proliferation.
Ensuring self-subsistence, Japan intends to reprocess all spent fuel domestically, as a national policy.
The Long-Term Program also states that interim storage of spent fuel ensures sufficient time before reprocessing, thus allowing flexibility in the nuclear fuel cycle.

There are concerns about safety and nuclear proliferation related to the use of plutonium recovered from reprocessing of spent fuel. To address these concerns, Japan is making every effort to ensure safety and to make Japan's policy understood in the international community.

B. 2 Spent Fuel Management Practices

Spent fuel generated in power reactors are sent to reprocessing facilities after a period of on-site cooling and storage. The spent fuel has been reprocessed overseas in accordance with contracts with British and French companies, with the exception of a portion reprocessed by the Tokai Reprocessing Plant of the

JNC. In the meantime, taking into account the call for domestic reprocessing, JNFL began constructing the Rokkasho-mura Spent Fuel Reprocessing Plant, based on operational experience accumulated at the Tokai Reprocessing Facility and on technologies and experience from countries advanced in reprocessing. The plant is to be completed by 2005. Storage of spent fuel in the plant's storage facility began in 1999 and export of spent fuel to foreign reprocessing plants ended in July 2001.

The Reactor Regulation Law was amended in 1999 to incorporate provisions on interim spent fuel storage, and a company is currently preparing for commercial operation of interim fuel storage facilities by 2010.

The spent fuel from research reactor facility has been exported to the USA, or is to be reprocessed in Japan.

B. 3 Radioactive Waste Management Policy

The AEC, in its Long-Term Program and other documents, states that the waste producers has the primary responsibility for safe processing and disposal of the waste and that the government has the responsibility for taking necessary measures to ensure that this processing and disposal are carried out appropriately and safely by the producers, through giving adequate guidance and setting necessary regulations. Further, the AEC states that the government should play an appropriate role in implementing the disposal program for radioactive waste, particularly HLW, with a view to ensuring long-term safety, in addition to its activities related to promotion of research and development activities and safety regulation. (*1)

The AEC states that the present generations, which enjoy the benefits of nuclear energy, are obliged to do their utmost to ensure the safe disposal of radioactive waste generated in the research, development and utilization of nuclear energy, and should invest continued efforts in achieving this goal. The AEC decided on November 2, 1993 to eliminate the option of sea dumping of radioactive waste, based on the Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter (1972) and its amendment to Annex I in 1993.

The AEC states that nuclear facilities should be decommissioned safely at the responsibility of license holder with the local community's understanding and support, and that generation of radioactive waste should be minimized. The AEC encourages research and development efforts aimed at recycling and/or reusing waste. The AEC acknowledges that waste below "clearance levels" need not be dealt with as radioactive material and may be handled as conventional waste, and encourages recycling to the fullest extent practical and reasonable.

*1:The policy on processing and disposal of radioactive waste, Decision by the AEC, Oct.22, 1985

B. 4 Radioactive Waste Management Practices

B. 4. 1 Government Activities related to Radioactive Waste Management

METI and MEXT have established and continued to improve the legal framework consisting of the Reactor Regulation Law and the Radiation Hazards Prevention Law, for safe and proper processing, storage and disposal of radioactive waste, based on studies and decisions made by the AEC and the NSC. Among these regulations, the criteria for gaseous and liquid radioactive waste disposal have been established in accordance with relevant international recommendations.

Solid radioactive waste is classified into two categories, namely HLW (liquid waste generated from spent fuel reprocessing in vitrified package) and other LLW. The LLW is sub-classified according to origin (differing radionuclide composition) and level of radioactivity, as shown in Table B. 4-1.

Table B. 4-2 shows the status of activities aimed at preparing the relevant regulations for disposal.

Following is a summary of the basic concepts for disposal shown in Table B. 4-2.

There are two basic concepts for land disposal, i.e. “geological disposal” and “near- and sub-surface disposal”. Near- and sub-surface disposal consists of near-surface disposal, including concrete vault and trench disposal, and sub-surface disposal at a depth sufficient to safety margin for conventional sub-surface use of land. HLW is disposed of solely by geological disposal, and LLW can be disposed of either by geological disposal or near- and sub-surface disposal, taking into consideration the characteristics of waste. Vitrified HLW is emplaced in a stable geological formation at a depth of more than 300 meters, following 30 to 50 years of interim storage to allow cooling. As for the LLW from power reactors, wastes with comparatively higher radioactivity are disposed of in sub-surface facilities, while other wastes are disposed of in concrete vaults or trenches, depending on their radioactivity levels. Radioactive wastes containing transuranic nuclides from reprocessing, uranium waste from enrichment and/or fuel manufacturing, and radioactive waste from medical, industrial and research facilities are disposed of either by geological disposal or near- and sub-surface disposal, depending on types of radionuclides and levels of radioactivity.

In the future, discussions will continue on measures that can be taken to provide different disposal methods in a single disposal facility, or disposing of wastes of different origin in a single disposal facility.

The AEC decides on the basic policy for disposal. Based on the policy, the NSC decides on the basic concept for the safety regulations for land disposal (*2), upper bounds of radioactivity concentration for disposal of radioactive materials and methods for assessing the safety of disposal facilities, METI and MEXT establish relevant regulations. To date, the regulations for disposal of LLW from power reactors, including the upper bounds in license applications for waste disposal, have already been established.
The radioactive waste returned from overseas reprocessing is disposed of together with waste from domestic reprocessing.

The Specified Radioactive Waste Final Disposal Act, enacted in the year 2000, stipulates the establishment of an implementing organization for disposal of HLW, the funds reserved for disposal, and procedure for selecting a disposal site, etc. Final Disposal Plan is developed every five years based on the Act.

Partitioning and transmutation is a technology used to separate radioactive materials with long half-lives in HLW from the rest of the waste and convert them into short half-lives or stable materials. This technology, even though it is still in early stage of development, should be further pursued because it may contribute to reducing cost the burden of waste processing and disposal and to effective use of available resources.

*2: Basic Concept for Safety Regulation for Land Disposal of Low-Level Solid Radioactive Waste (Committee on Safety Regulation of Radioactive Waste, NSC, October 11, 1985)

B. 4. 2 Radioactive Waste Management Practices by Operators

Operators, recognizing their responsibility concerning radioactive waste management addressed in B.3,

shall manage radioactive waste generated at their facilities in compliance with the Reactor Regulation Law, the Radiation Hazards Prevention Law and relevant regulations.

(1) High-Level Radioactive Waste Management Practices

Spent fuel has been reprocessed by the Tokai Reprocessing Plant of the JNC and by overseas reprocessing plants in France and the United Kingdom. In the meantime, JNFL is constructing a vitrification facility for HLW, attached to its reprocessing facility. This is to be completed by 2005.

High-level liquid waste generated at the Tokai Reprocessing Plant of the JNC is stored in a tank within the facility. The vitrification facility started operation in January 1995 and had produced 130 canisters by March 2003.

Utilities in Japan have concluded reprocessing contracts with British and French companies for a total of 5,600 t U of light water reactor spent fuel and 1,500 t U of gas cooled reactor spent fuel. In accordance with these contracts, vitrified waste packages are returned to the utilities and are stored by JNFL. By March 2003, 616 vitrified packages had been returned and a total of 2,200 packages will be stored, with remaining packages to be returned in the next ten-odd years.

Vitrified waste will be disposed of by geological disposal. Based on the Specified Radioactive Waste Final Disposal Act, the Nuclear Waste Management Organization of Japan, the responsible implementing body, will select preliminary investigation areas, then detailed investigation areas and, finally, a site for disposal facility construction, and will implement disposal of HLW in this disposal facility.

(2) Low-Level Radioactive Waste Management Practices

As shown in B. 4. 1, LLW is classified into waste from power reactors, waste containing transuranic nuclides, uranium waste and radioactive waste from medical, industrial and research facilities. The waste management strategy for each of these categories is as follows.

1) Waste from Power Reactors

As of March 2003, fifty-four nuclear power reactors were in operation. Liquid waste concentrate is solidified with cement in drums after evaporation. Paper, clothing and other combustibles are placed in drums after incineration. Plastics, metals and other non-combustibles are placed in drums after compaction. Used steam generators and other large-volume solid wastes are placed in storage facilities. Of the comparatively highly radioactive waste, replaced control rods and channel boxes, etc. are stored in spent fuel pools and spent ion exchange resins are stored in tanks. Near-surface disposal of LLW solidified with cement in drums started in 1992 at the disposal facility of JNFL at Rokkasho Village in Aomori Prefecture.

A reactor at the Tokai Power Station of the Japan Atomic Power Co. ceased operation in 1998 and has been in decommissioning since December 2001. The advanced thermal reactor “Fugen” of JNC ceased commercial operation in March 2003 and decommissioning will start after about ten years of preparation.

2) Waste Containing Transuranic Nuclides

Liquid transuranic waste generated at the Tokai Reprocessing Plant of JNC is stored in tanks temporarily, and a portion of the liquid waste are solidified in drums after concentration by evaporation. Segmented fuel cladding, used filters and sampling bottles are put in containers and other solid waste is put into drums. These drums and the containers are being held in storage at

on-site storage facilities.

3) Uranium Waste

Liquid waste containing uranium generated from enrichment and/or fuel manufacturing facilities of JNC and/or other private facilities are stored in tanks. Solid uranium waste and the ash resulting from the incineration of part of the solid uranium waste are put in drums. They are held in storage at on-site storage facilities.

4) Radioactive Waste from Medical, Industrial and Research Facilities

Radioactive waste generated from medical and industrial uses is collected by the operators of radioisotope waste management facilities, who store it in their own storage facilities after processing such as, compaction or incineration. Radioactive waste generated in research reactor facilities and fuel material use facilities of the Japan Atomic Energy Research Institute (JAERI), the JNC and universities are stored in their own storage facilities after processing such as compaction or incineration.

B. 5 Criteria for Definition and Classification of Radioactive Waste

As shown in B. 4, radioactive waste is classified into two categories, namely HLW and LLW. Depending on its origin, the LLW is sub-classified into waste from power reactors, waste containing transuranic nuclides, uranium waste and radioactive waste from medical, industrial and research facilities.

Based on a report published by the NSC, a provision was formulated under the Reactor Regulation Law on the upper bounds of radionuclides concentration in license applications for disposal of waste from reactor facilities.

The NSC is discussing clearance levels for radioactive waste, founded on the basic concept set out by the AEC, and has published clearance levels (radionuclide concentrations) for waste from light water reactors, gas-cooled reactors, heavy water reactors, fast reactors and fuel material use facilities, as well as clearance level certification methods.

Table B. 4-1 Classification of Radioactive Waste

Classification			Example	Origin of Waste
High-Level Radioactive Waste			Vitrified Liquid Waste	Reprocessing facilities
Low-Level Radio-active Waste	Waste from Power Reactors	Waste with Comparatively High Radioactivity	Control Rods Core Internals	Power Reactors
		Low-Level Waste	Liquid Waste Filters Used Equipment Expendables	
		Very Low-Level Waste	Concrete Metals	
	Waste Containing Transuranic Nuclides		Parts of Fuel Rod Liquid Waste Filters	Reprocessing Facilities MOX Fuel Fabrication Facilities
	Uranium Waste		Expendables Sludge Used Equipment	Enrichment and Fuel Manufacturing Facilities
	Radioactive Waste from Medical, Industrial and Research Facilities		Solidified Package Metals Concrete Plastics Filters Miscellaneous Solids	Fuel Material Use Facilities Radioisotope Use Facilities Research reactor Facilities
Waste below Clearance Levels			Waste from Decommissioning	All Nuclear Facilities

Table B.4-2 Classification of basic concepts for disposal and status of activities preparing for relevant regulations

			Atomic Energy Commission	Nuclear Safety Commission			Situation regarding establishment of regulatory law and provisions
			Basic concepts for disposal	Basic concept for safety regulation	Restriction for disposal facility	Method of safety assessment	
High-Level Radioactive Waste			Established May 1998	Studied Nov 2000	To be studied	To be studied	To be established
Low-Level Radioactive Waste	Waste from Power Reactors	Waste with Comparatively High Radioactivity (core internals, etc.)	Established Oct 1998	Established Sep 2000	Established Sep 2000	To be studied	Almost established Dec 2000
		Low-Level Waste	Established Aug 1984	Established Oct 1985	Established Feb 1987, June 1992	Studied Mar 1988, Jan 1993	Almost established Mar 1987, Feb 1993
		Very Low-Level Waste			Established June 1992, Sep 2000	Studied Jan 1993	Almost established Sep 1992 Dec 2000
	Waste Containing Transuranic Nuclides		Established Apr 2000	Under study	To be studied	To be studied	To be established
	Uranium Waste		Established Dec 2000	Under study	To be studied	To be studied	To be established
	Radioactive Waste from Medical, Industrial and Research Facilities*2		Established June 1998	Under study	To be studied	To be studied	To be established
Clearance Levels			Established Aug 1984	Established Mar 1999, Jul 2001, Apr 2003*1			To be established

*1 : Clearance levels for Main Nuclear Facilities, Clearance levels for Heavy Water Reactors and Fast Neutron Reactors, Clearance levels for Fuel Material Use Facilities (Facilities where Irradiated Fuel and Materials are handled).

*2 : Status of study by the Atomic Energy Commission and Nuclear Safety Commission and the situation regarding establishment of laws and provisions for radioactive waste generated from reactor facilities are the same as the status and situation for waste from power reactors.

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C. Scope of Application

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Section C. Scope of Application (Article 3)

1. **This Convention shall apply to the safety of spent fuel management when the spent fuel results from the operation of civilian nuclear reactors. Spent fuel held at reprocessing facilities as part of a reprocessing activity is not covered in the scope of this Convention unless the Contracting Party declares reprocessing to be part of spent fuel management.**
2. **This Convention shall also apply to the safety of radioactive waste management when the radioactive waste results from civilian applications. However, this Convention shall not apply to waste that contains only naturally occurring radioactive materials and that does not originate from the nuclear fuel cycle, unless it constitutes a disused sealed source or it is declared as radioactive waste for the purposes of this Convention by the Contracting Party.**
3. **This Convention shall not apply to the safety of management of spent fuel or radioactive waste within military or defence programmes, unless declared as spent fuel or radioactive waste for the purposes of this Convention by the Contracting Party. However, this Convention shall apply to the safety of management of spent fuel and radioactive waste from military or defence programmes if and when such materials are transferred permanently to and managed within exclusively civilian programmes.**
4. **This Convention shall also apply to discharges as provided for in Articles 4, 7, 11, 14, 24 and 26.**

The government of Japan applies this Convention to the safety of spent fuel management when the spent fuel results from the operation of civilian nuclear reactors. The government of Japan, jointly with UK and France, declared that it should report, within the context of the Convention, on reprocessing as part of spent fuel management (September 5, 1997), and, when acceding to the convention, declared reprocessing to be part of spent fuel management.

The government of Japan applies this Convention to the safety of radioactive waste management when the radioactive waste results from civilian applications. However, the government of Japan does not apply this Convention to waste that contains only naturally occurring radioactive materials and that does not originate from the nuclear fuel cycle.

Japan does not have, or does not plan to have, any spent fuel within military or defence programmes. The government of Japan does not make declaration specified in the Article 3. 3.

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D. Lists and Inventories

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Section D. Lists and Inventories (Article 32, Section 2)

This report shall also include:

(i) a list of the spent fuel management facilities subject to this Convention, their location, main purpose and essential features;

(ii) an inventory of spent fuel that is subject to this Convention and that is being held in storage and of that which has been disposed of. This inventory shall contain a description of the material and, if available, give information on its mass and its total activity;

(iii) a list of the radioactive waste management facilities subject to this Convention, their location, main purpose and essential features;

(iv) an inventory of radioactive waste that is subject to this Convention that:
- **(a) is being held in storage at radioactive waste management and nuclear fuel cycle facilities;**
- **(b) has been disposed of; or**
- **(c) has resulted from past practices. This inventory shall contain a description of the material and other appropriate information available, such as volume or mass, activity and specific radionuclides;**

(v) a list of nuclear facilities in the process of being decommissioned and the status of decommissioning activities at those facilities.

D.1 List of Spent Fuel Management Facilities

Spent fuel from power reactor facilities is being held in storage at spent fuel management facilities within power reactor facilities or at the spent fuel management facilities within the Tokai Reprocessing Facility of JNC and Rokkasho Reprocessing Plant of JNFL. Spent fuel from research reactor facilities is being held in storage at spent fuel management facilities of the research reactor facilities. The locations, main purposes and essential features of these spent fuel management facilities are listed in Tables D.1-1 and D.1-2.

D.2 Inventory of Spent Fuel

Spent fuel stored in above-mentioned spent fuel management facilities totals approximately 11,000 ton as of the end of March, 2003.

D.3 List of Radioactive Waste Management Facilities

Radioactive waste management facilities within power reactor facilities include the followings: waste processing facilities where waste generated at the reactor facility is processed; solid waste storage facilities where drums (homogeneous solidification, fill-up solidification, miscellaneous solid and others), etc. filled with processed waste are being held in storage; storage facilities where the replaced steam generators and other large solid wastes are being held in storage; spent fuel pools etc. where the used control rods, the disused channel boxes, etc. are being held in storage; and tanks where the spent ion exchange resin is being held in storage.

Radioactive waste management facilities within enrichment and fuel manufacturing facilities include the followings; waste processing equipments that processes waste generated at the facilities; and solid waste storage facilities where drums filled with processed waste are held in storage.

Radioactive waste management facilities within spent fuel reprocessing facilities include the followings; waste processing equipments that processes waste generated at the facility; waste storage facilities where vitrified waste and high level liquid waste are being held in storage; and waste storage facilities where low level liquid waste and low level solid waste are being held in storage.

Radioactive waste management facilities licensed under the disposal business include the followings; radioactive waste repositories where radioactive waste is disposed of; and waste management facilities where radioactive waste is processed and being held in storage before disposal.

Radioactive waste management facilities within research reactor facilities and major fuel material use facilities include the followings; waste processing equipments that processes low level radioactive waste generated at those facilities; and solid waste storage facilities where drums filled with processed waste are being held in storage.

Radioisotope waste management facilities licensed on the basis of the Radiation Hazards Prevention Law include storage facilities, where drums, etc. filled with processed waste generated at radioisotopes use facilities, etc, are being held in storage.

Radioactive waste management facilities licensed on the basis of the Medical Care Laws etc. include the storage facilities, etc., where drums, etc. filled with processed radioactive medical waste generated at medical care facilities, etc, being are being held in storage.

The locations, main purposes and essential features of these radioactive waste management facilities are listed in Tables D.3-1 and D.3-2.

D.4 Inventory of Radioactive Waste

D.4.1 Inventory of Radioactive Waste Being Held in Storage

Radioactive waste from power reactor facilities, including approximately 550,000 drums (converted to number of 200 litter drums) in solid waste storage facilities, 29 steam generators in steam generator storage facilities, used control rods, disused channel boxes, spent resin in spent fuel pools and other facilities respectively, are stored at end of March 2003.

HLWs of approximately 700 vitrified packages and approximately 400m^3 high level liquid waste are stored in fuel reprocessing facilities. LLWs of approximately 440,000 drums (converted to number of 200 litter drums) and approximately 4,000m^3 low level liquid waste are stored in fuel reprocessing facilities, fuel fabrication facilities, laboratories, research reactor facilities of universities, and storage facilities of Japan Radioisotopes Association at end of March 2003.

D.4.2 Inventory of Radioactive Waste That Has Been Disposed of

A portion of LLW from power reactor facilities, which has comparatively low concentration of radionuclides has been transported to a radioactive waste disposal facility of a disposal business operator and disposed of at near surface disposal facility since 1992.

The amount of the waste emplaced at the disposal facility is listed in Table D.4-1. Presently, the

disposal facility of JNFL is in operation and has disposed of about 150,000 drums (each carrying 200 liters) of waste, as of the end of March 2003. At the disposal facility of Tokai Research Establishment of JAERI, disposal of about 1,670 tons of very low level waste resulting from dismantling of JPDR was finished in 1995, and the disposal facility has been at the preservation stage since October 1997.

D.4.3 Inventory of Radioactive Waste that Has Resulted from Past Practices

None.

D.5 List of Nuclear Facilities in the Process of Being Decommissioned

Nuclear facilities in the process of being decommissioned include Tokai Power Plant of Japan Atomic Power Co., and JRR-2 of JAERI. Nuclear facilities scheduled to be decommissioned include the advanced thermal reactor Fugen Nuclear Power Plant of JNC. The status of decommissioning activities, etc. is listed in Tables D.5-1 and D.5-2.

Table D.1-1 List of Spent Fuel Management Facilities (Related to Power Generation) (No. 1)

Nuclear facilities where spent fuel management facilities are located	Location	Main purpose	Essential features
Japan Atomic Power Co. Tokai-2 Power Station	Ibaraki-pref.	Storage of spent fuel	Wet storage (partly stored in dry casks)
Japan Atomic Power Co. Tsuruga Power Station	Fukui-pref.	Storage of spent fuel	Wet storage
Hokkaido Electric Power Co., Inc. Tomari Power Station	Hokkaido-pref.	Storage of spent fuel	Wet storage
Tohoku Electric Power Co., Inc. Onagawa Nuclear Power Station	Miyagi-pref.	Storage of spent fuel	Wet storage
The Tokyo Electric Power Co., Inc. Fukushima Daiichi Nuclear Power Station	Fukushima-pref.	Storage of spent fuel	Wet storage (partly stored in dry casks)
The Tokyo Electric Power Co., Inc. Fukushima Daini Nuclear Power Station	Fukushima-pref.	Storage of spent fuel	Wet storage
The Tokyo Electric Power Co., Inc. Kashiwazaki Kariwa Nuclear Power Station	Niigata-pref.	Storage of spent fuel	Wet storage
The Chubu Electric Power Co., Inc. Hamaoka Nuclear Power Station	Shizuoka-pref.	Storage of spent fuel	Wet storage
Hokuriku Electric Power Co., Inc. Shika Nuclear Power Station	Ishikawa-pref.	Storage of spent fuel	Wet storage
The Kansai Electric Power Co., Inc. Mihama Power Station	Fukui-pref.	Storage of spent fuel	Wet storage
The Kansai Electric Power Co., Inc. Takahama Power Station	Fukui-pref.	Storage of spent fuel	Wet storage
The Kansai Electric Power Co., Inc. Ohi Power Station	Fukui-pref.	Storage of spent fuel	Wet storage
The Chugoku Electric Power Co., Inc. Shimane Nuclear Power Station	Shimane-pref.	Storage of spent fuel	Wet storage
Shikoku Electric Power Co., Inc. Ikata Power Station	Ehime-pref.	Storage of spent fuel	Wet storage
Kyushu Electric Power Co., Inc. Genkai Nuclear Power Station	Saga-pref.	Storage of spent fuel	Wet storage
Kyushu Electric Power Co., Inc. Sendai Nuclear Power Station	Kagoshima-pref.	Storage of spent fuel	Wet storage
Japan Nuclear Cycle Development Institute Fugen Nuclear Power Station	Fukui-pref.	Storage of spent fuel	Wet storage
Japan Nuclear Cycle Development Institute Tokai Reprocessing Plant	Ibaraki-pref.	Storage of spent fuel	Wet storage
Japan Nuclear Fuel Limited Rokkasho Reprocessing Plant	Aomori-pref.	Storage of spent fuel	Wet storage
Japan Nuclear Cycle Development Institute Monju	Fukui-pref.	Storage of spent fuel	Wet storage*1

(As of the end of March 2003)

*1: Pre-service inspection stage

Table D.1-2 List of Spent Fuel Management Facilities (Research Reactors) (No. 2)

Nuclear facilities where spent fuel management facilities are located	Location	Main purpose	Essential features
Japan Atomic Energy Research Institute Tokai Research Establishment	Ibaraki-pref.	Storage of spent fuel	Dry storage
Japan Atomic Energy Research Institute Oarai Research Establishment	Ibaraki-pref.	Storage of spent fuel	Wet storage
Japan Atomic Energy Research Institute Mutsu Establishment	Aomori-pref.	Storage of spent fuel	Dry storage
Japan Nuclear Cycle Development Institute Oarai Engineering Center	Ibaraki-pref.	Storage of spent fuel	Wet storage
Rikkyo University Institute for Atomic Energy	Kanagawa-pref.	Storage of spent fuel	Dry storage
Musashi Institute of Technology Atomic Energy Research Laboratory	Kanagawa-pref.	Storage of spent fuel	Dry storage
Kyoto University Research Reactor Institute	Osaka-pref.	Storage of spent fuel	Wet storage
Toshiba Corporation Research Reactor Center	Kanagawa-pref.	Storage of spent fuel	Wet storage
Hitachi Engineering Co., Ltd. Ozenji Branch Section	Kanagawa-pref.	Storage of spent fuel	Wet storage

(As of the end of March 2003)

<Reference>

List of Nuclear facilities where spent fuel management facilities are not located (Research Reactors)

Nuclear facilities	Location
Kinki University Atomic Energy Research Institute	Osaka-pref.
The University of Tokyo Nuclear Engineering Laboratory, Graduate School of Engineering	Ibaraki-pref.
Toshiba Corporation Nuclear Engineering Lab.	Kanagawa-pref.
Hitachi, Ltd. Power & Industrial Systems R&D Laboratory Ozenji Branch Section	Kanagawa-pref.

(As of the end of March 2003)

* Because of small thermal output, there is no assumption to generate spent fuel in the research reactors on this list during the service period

Table D.3-1 List of Radioactive Waste Management Facilities (Power Reactors)

Nuclear facilities where radioactive waste management facilities are located	Location	Main Purpose	Essential Features
Japan Atomic Power Co. Tokai Power Station	Ibaraki-pref.	Processing and storage of waste from the power plant	Stored at a storage facility after volume reduction by compaction, incineration, etc.
Japan Atomic Power Co. Tokai-2 Power Station	Ibaraki-pref.	Processing and storage of waste from the power plant	Stored at a storage facility after volume reduction by compaction, incineration, etc.
Japan Atomic Power Co. Tsuruga Power Station	Fukui-pref.	Processing and storage of waste from the power plant	Stored at a storage facility after volume reduction by compaction, incineration, etc.
Hokkaido Electric Power Co., Inc. Tomari Power Station	Hokkaido-pref.	Processing and storage of waste from the power plant	Stored at a storage facility after volume reduction by compaction, incineration, etc.
Tohoku Electric Power Co., Inc. Onagawa Nuclear Power Station	Miyagi-pref.	Processing and storage of waste from the power plant	Stored at a storage facility after volume reduction by compaction, incineration, etc.
The Tokyo Electric Power Co., Inc. Fukushima Daiichi Nuclear Power Station	Fukushima-pref.	Processing and storage of waste from the power plant	Stored at a storage facility after volume reduction by compaction, incineration, etc.
The Tokyo Electric Power Co., Inc. Fukushima Daini Nuclear Power Station	Fukushima-pref.	Processing and storage of waste from the power plant	Stored at a storage facility after volume reduction by compaction, incineration, etc.
The Tokyo Electric Power Co., Inc. Kashiwazaki Kariwa Nuclear Power Station	Niigata-pref.	Processing and storage of waste from the power plant	Stored at a storage facility after volume reduction by compaction, incineration, etc.
The Chubu Electric Power Co., Inc. Hamaoka Nuclear Power Station	Shizuoka-pref.	Processing and storage of waste from the power plant	Stored at a storage facility after volume reduction by compaction, incineration, etc.
Hokuriku Electric Power Co., Inc. Shika Nuclear Power Station	Ishikawa-pref.	Processing and storage of waste from the power plant	Stored at a storage facility after volume reduction by compaction, incineration, etc.
The Kansai Electric Power Co., Inc. Mihama Power Station	Fukui-pref.	Processing and storage of waste from the power plant	Stored at a storage facility after volume reduction by compaction, incineration, etc.
The Kansai Electric Power Co., Inc. Takahama Power Station	Fukui-pref.	Processing and storage of waste from the power plant	Stored at a storage facility after volume reduction by compaction, incineration, etc.
The Kansai Electric Power Co., Inc. Ohi Power Station	Fukui-pref.	Processing and storage of waste from the power plant	Stored at a storage facility after volume reduction by compaction, incineration, etc.
The Chugoku Electric Power Co., Inc. Shimane Nuclear Power Station	Shimane-pref.	Processing and storage of waste from the power plant	Stored at a storage facility after volume reduction by compaction, incineration, etc.
Shikoku Electric Power Co., Inc. Ikata Power Station	Ehime-pref.	Processing and storage of waste from the power plant	Stored at a storage facility after volume reduction by compaction, incineration, etc.
Kyushu Electric Power Co., Inc. Genkai Nuclear Power Station	Saga-pref.	Processing and storage of waste from the power plant	Stored at a storage facility after volume reduction by compaction, incineration, etc.
Kyushu Electric Power Co., Inc. Sendai Nuclear Power Station	Kagoshima-pref.	Processing and storage of waste from the power plant	Stored at a storage facility after volume reduction by compaction, incineration, etc.
Japan Nuclear Cycle Development Institute, the advanced thermal Reactor Fugen Nuclear Power Plant	Fukui-pref.	Processing and storage of waste from the power plant	Stored at a storage facility after volume reduction by compaction, incineration, etc.
Japan Nuclear Cycle Development Institute Monju	Fukui-pref.	Processing and storage of waste from the power plant	Stored at a storage facility after volume reduction by compaction, etc.

(As of the end of March 2003)

Table D.3-2 List of Radioactive Waste Management Facilities (Other Than Power Reactors)

Nuclear facilities where radioactive waste management facilities are located		Location	Main Purpose	Essential features
Global Nuclear Fuel - Japan Co., Ltd.	Enrichment and/or fuel manufacturing facility	Kanagawa-pref.	Processing and storage of uranium waste	Stored at a storage facility, etc. after volume reduction by compaction, etc.
Mitsubishi Nuclear Fuel Co., Ltd.	Enrichment and/or fuel manufacturing facility	Ibaraki-pref.	Processing and storage of uranium waste	Stored at a storage facility, etc. after volume reduction by compaction, incineration, etc.
Nuclear Fuel Industries, Ltd. Tokai Works	Enrichment and/or fuel manufacturing facility	Ibaraki-pref.	Processing and storage of uranium waste	Stored at a storage facility, etc. after volume reduction by incineration, etc.
	Fuel material use facility		Processing and storage of waste from fuel material use facility	Stored at a storage facility, etc. after volume reduction by incineration, etc.
Nuclear Fuel Industries, Ltd. Kumatori Works	Enrichment and/or fuel manufacturing facility	Osaka-pref.	Processing and storage of uranium waste	Stored at a storage facility, etc. after volume reduction by compaction, etc.
Japan Nuclear Cycle Development Institute Ningyo-Toge Environmental Engineering Center	Enrichment and/or fuel manufacturing facility	Okayama-pref.	Processing and storage of uranium waste	Stored at a storage facility, etc. after volume reduction by incineration, etc.
	Fuel material use facility		Processing and storage of waste from fuel material use facility	Stored at a storage facility, etc. after volume reduction by incineration, etc.
Japan Nuclear Cycle Development Institute Tokai Works	Reprocessing facility	Ibaraki-pref.	Processing and storage of HLW and waste containing transuranic nuclides	HLW stored after vitrification, waste containing transuranic nuclides stored after volume reduction by incineration, etc.
	Fuel material use facility		Processing and storage of waste from fuel material use facility	Stored at a storage facility, etc. after volume reduction by compaction, incineration, etc.
Japan Nuclear Cycle Development Institute 0arai Engineering Center	Research reactor facility; Fuel material use facility	Ibaraki-pref.	Processing and storage of waste from fuel material use facility and research reactor facility	Stored at a storage facility, etc. after volume reduction by compaction, etc.
Japan Nuclear Fuel Limited Reprocessing Business division	Reprocessing facility	Aomori-pref.	Processing and storage of HLW and waste containing transuranic nuclides	Presently, waste from a reception and storage facility for spent fuel is stored at a storage facility (main facility is currently under construction).
	Waste management facility		Storage of vitrified waste	A storage facility for returned vitrified waste

Nuclear facilities where radioactive waste management facilities are located		Location	Main Purpose	Essential features
Japan Nuclear Fuel Limited Enrichment and Disposal Office	Waste disposal facility	Aomori-pref.	Disposal of low level radioactive waste	Unit 1 Disposal facility and Unit 2 Disposal facility
	Enrichment and/or fuel manufacturing facility		Processing and storage of uranium waste	Stored at a storage facility
Japan Atomic Energy Research Institute Tokai Research Establishment	Waste disposal facility	Ibaraki-Pref.	Disposal of low level radioactive waste	
	Research reactor facility; Fuel material use facility; Radioisotope Waste Management facility*1		Processing and storage of radioactive waste from medical, industrial and research facilities	Stored at a storage facility, etc. after volume reduction by compaction, incineration, etc.
Japan Atomic Energy Research Institute Oarai Research Establishment	Waste management facility; Fuel material use facility; Radioisotope Waste Management facility*1	Ibaraki-Pref.	Processing and storage of radioactive waste from medical, industrial and research facilities	Stored at a storage facility, etc. after volume reduction by compaction, incineration, etc.
	Research reactor facility		Storage of waste from research reactor facility	Storage of ion exchange resin
Japan Atomic Energy Research Institute Mutsu Establishment	Research reactor facility	Aomori-Pref.	Processing and storage of waste from research reactor facility	Stored at a storage facility, etc. after volume reduction by compaction, etc.
The University of Tokyo Nuclear Engineering Research Laboratory, Graduate School of Engineering	Research reactor facility; Fuel material use facility	Ibaraki-Pref.	Momentary storage of waste from research reactor facility and fuel material use facility	Processed in Japan Atomic Energy Research Institute Tokai Research Establishment
Kyoto University Research Reactor Institute	Research reactor facility Fuel material use facility	Osaka-pref.	Processing and storage of waste from research reactor facility and fuel material use facility	Stored at a storage facility, etc. after volume reduction by compaction, etc.
Rikkyo University Institute for Atomic Energy	Research reactor facility	Kanagawa-pref.	Processing and storage of waste from research reactor facility	Stored at a storage facility, etc. after volume reduction by compaction, etc.
Musashi Institute of University Atomic Energy Research Institute	Research reactor facility	Kanagawa-pref.	Storage of waste from research reactor facility	Stored at a storage facility, etc.
Kinki University Atomic Energy Research Institute	Research reactor facility	Osaka-pref.	Storage of waste from research reactor facility	Stored at a storage facility, etc.
Toshiba Corporation Research Reactor Center	Research reactor facility	Kanagawa-pref.	Storage of waste from research reactor facility	Stored at a storage facility, etc.

Nuclear facilities where radioactive waste management facilities are located		Location	Main Purpose	Essential features
Toshiba Corporation Nuclear Engineering Lab.	Fuel material use facility; Research reactor facility	Kanagawa-pref.	Storage of waste from research reactor facility and fuel material use facility	Stored at a storage facility, etc.
Hitachi, Ltd. Power & Industrial Systems R&D Laboratory Ozenji Branch Section	Research reactor facility	Kanagawa-pref.	Storage of waste from research reactor facility	Stored at a storage facility, etc.
Hitachi Engineering Co., Ltd. Ozenji Branch Section	Research reactor facility	Kanagawa-pref.	Storage of waste from research reactor facility	Stored at a storage facility, etc.
National Institute of Radiological Sciences Radiotoxicology Building Operations Section	Fuel material use facility	Chiba-pref.	Storage of waste from fuel material use facility	Stored at a storage facility, etc.
National Institute of Advanced Industrial Science and Technology Tsukuba Central 2	Fuel material use facility	Ibaraki-pref.	Storage of waste from fuel material use facility	Stored at a storage facility, etc.
Nuclear Material Control Center Rokkasho Safeguards Analytical Laboratory	Fuel material use facility	Aomori-pref.	Processing and storage of waste from fuel material use facility	Stored at a storage facility, etc. after volume reduction by compaction, incineration, etc.
Nuclear Material Control Center Tokai Safeguards Center	Fuel material use facility	Ibaraki-pref.	Storage of waste from fuel material use facility	Stored at a storage facility, etc.
Nippon Nuclear Fuel Development Co., Ltd. NFD Hot Laboratory	Fuel material use facility	Ibaraki-pref.	Processing and storage of waste from fuel material use facility	Stored at a storage facility, etc. after volume reduction by compaction, etc.
Nuclear Development Corporation Fuel Hot Laboratory	Fuel material use facility	Ibaraki-pref.	Processing and storage of waste from fuel material use facility	Stored at a storage facility, etc. after volume reduction by compaction, etc.
Japan Radioisotope Association The Kaya Memorial Takizawa Laboratory	Radioisotope Waste Management facility*2	Iwate-pref.	Processing and storage of waste from radioisotope use facility, etc.	Stored at a storage facility, etc. after volume reduction by compaction, incineration, etc.
Japan Radioisotope Association Tohoku Storage Facility	Radioisotope Waste Management facility*2	Miyagi-pref.	Storage of waste from radioisotope use facility, etc.	Stored at a storage facility, etc.
Japan Radioisotope Association Kanto Storage Facility	Radioisotope Waste Management facility*2	Ibaraki-pref.	Storage of waste from radioisotope use facility, etc.	Stored at a storage facility, etc.
Japan Radioisotope Association Ichihara Office	Radioisotope Waste Management facility*2	Chiba-pref.	Storage of waste from radioisotope use facility, etc.	Stored at a storage facility, etc.
Japan Radioisotope Association Kanto Waste Relay Station II	Radioisotope Waste Management facility*2	Chiba-pref.	Processing and storage of waste from radioisotope use facility, etc.	Stored at a storage facility, etc. after volume reduction by compaction, etc.

Nuclear facilities where radioactive waste management facilities are located		Location	Main Purpose	Essential features
Japan Radioisotope Association Kanto Waste Relay Station	Radioisotope Waste Management facility*2	Chiba-pref.	Storage of waste from radioisotope use facility, etc.	Stored at a storage facility, etc.
Japan Radioisotope Association Kansai Waste Relay Station	Radioisotope Waste Management facility*2	Kyoto-pref.	Storage of waste from radioisotope use facility, etc.	Stored at a storage facility, etc.
The University of Tokyo Radioisotope Center	Radioisotope Waste Management facility*1	Tokyo-Metro.	Processing and storage of waste from radioisotope use facility, etc.	Stored at a storage facility, etc. after volume reduction by incineration, etc.
T.N. Technos Co. Tsukuba Research Center	Radioisotope Waste Management facility*1	Ibaraki-pref.	Processing and storage of waste from radioisotope use facility, etc.	Stored at a storage facility, etc. after volume reduction by incineration, etc.

(As of the end of March 2003)

*1 : Radioisotope Waste Management facility licensed on the basis of the Radiation Hazards Prevention Law

*2 : Radioisotope Waste Management facility licensed on the basis of the Radiation Hazards Prevention Law and the Medical Care Laws etc.

Table D.4-1 The Amount of Waste Disposed of

Name of facility		Representative nuclides	Disposed amount
Japan Nuclear Fuel Limited, Enrichment/waste disposal division, Radioactive waste disposal facility*1	No. 1 disposal facility	Co-60, Ni-63, Cs-137, Sr- 90, C-14	134,683 drums*3
	No. 2 disposal facility	Co-60, Ni-63, Cs-137, Sr- 90, C-14	15,832 drums*3
Japan Atomic Energy Research Institute, Tokai Research Establishment *2	Waste disposal facility	Co-60, Ni-63, Cs-137, Sr- 90, Ca-41, C-14, Eu-152, H-3	1,670 tons

*1: As of the end of March 2003

*2: Disposal of very low level concrete waste resulting from the dismantling of JPDR. Disposal completed in 1995, and operation has been shifted to the preservation stage of the disposal facility since October 1997.

*3: 200-liter drums

Table D.5-1 List of Nuclear Facilities in the Process of Being Decommissioned and Planned to Be Decommissioned. Status of Decommissioning Activities at These Facilities (With Respect to Power Reactors)

Name of facility	Location	Reactor type	Electrical output (MW)	Commercial operation	Status of decommissioning
Japan Atomic Power Co., Tokai Power Plant	Ibaraki -pref.	GCR	166	Jul 1966 - Mar 1998	Decommissioning started in 2001
Japan Nuclear Cycle Development Institute, the advanced thermal reactor Fugen Nuclear Power Plant	Fukui -pref.	ATR	165	1979 - Mar 2003	Commercial operation discontinued in March 2003. It will start decommissioning procedure after ten years of preparation.

(As of the end of March 2003)

Table D.5-2 List of Nuclear Facilities in the Process of Being Decommissioned and Planned to Be Decommissioned. Status of Decommissioning Activities at These Facilities
(With Respect to Research Reactors)

Name of facility	Location	Reactor type	Thermal output (kW)	Service period	Status of decommissioning
Japan Atomic Energy Research Institute Tokai Research Establishment JRR-1	Ibaraki-pref.	Water-boiler reactor	50	Aug 1957 - Mar 1969	Decommissioning has been completed. The reactor body, fuel material handling equipment, primary cooling equipment and, a sub-pile room are currently being maintained as remaining facilities.
Japan Atomic Energy Research Institute Tokai Research Establishment JRR-2	Ibaraki-pref.	Heavy-water moderated cooling tank reactor	10,000	Oct 1960 - Dec 1996	The following activities for decommissioning have been completed. Shipment of spent fuel and heavy water, isolation of reactor cooling system and reactor body, removal of secondary cooling system and experimental equipment.
Japan Atomic Energy Research Institute Tokai Research Establishment VHTRC	Ibaraki-pref.	Graphite-moderated reactor	0.01	May 1985 - Jun 1999	Dismantling and removal of the reactor body and leveling of reactor (including resin painting) have been completed.
Japan Atomic Energy Research Institute Mutsu Establishment The Reactor Facilities Of The First Nuclear Ship (Mutsu)	Aomori-pref.	Pressurized light-water moderated and cooled reactor, PWR	36,000	Aug 1974 - Feb 1992	Dismantling has been completed. Accessory land facilities are currently being maintained for the purpose of storing solid waste and processing liquid waste .
Japan Nuclear Cycle Development Institute. Oarai Engineering Center Deuterium Critical Assembly (DCA)	Ibaraki-pref.	Heavy-water moderated reactor	1	Dec 1969 - Sep 2001	Deactivation has been completed.

Name of facility	Location	Reactor type	Thermal output (kW)	Service period	Status of decommissioning
Hitachi Engineering Co., Ltd. Ozenji Branch Section HTR	Kanagawa -pref.	Light-water moderated and cooled reactor	100	Dec 1961 - Feb 1975	Dismantling has been completed. Currently being proceeding are the maintenance of the pool storing spent fuel and the storage and maintenance of radioactive waste.
Toshiba Corporation Research Reactor Center Toshiba Training Reactor-1 (TTR-1)	Kanagawa -pref.	Light-water moderated inhomogeneous reactor	100	Mar 1962 - Jan 2001	Permanent suspension of operational functions and removal of reactor cooling system facilities.
Hitachi, Ltd. Power & Industrial Systems R&D Laboratory Ozenji Branch Section OCF	Kanagawa -pref.	Light-water moderated and cooled inhomogeneous reactor	0.1	Oct 1962 - Sep 1968	Dismantling has been completed. Radioactive waste is currently being stored and maintained.
Rikkyo University Institute for Atomic Energy	Kanagawa -pref.	Zirconium hydride moderated light-water cooled reactor	100	Dec 1961 - Dec 2001	Dismantling started in 2002.

(As of the end of March 2003)

E. Legislative and Regulatory System

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Section E. Legislative and Regulatory System

E.1 Implementing Measures (Article 18)

Each Contracting Party shall take, within the framework of its national law, the legislative, regulatory and administrative measures and other steps necessary for implementing its obligations under this Convention.

This report describes the legislative, regulatory and administrative measures and other steps, taken by the Government of Japan, necessary for implementing its obligation under this Convention.

E.2 Legislative and Regulatory Framework (Article 19)

Each Contracting Party shall establish and maintain a legislative and regulatory framework to govern the safety of spent fuel and radioactive waste management.

This legislative and regulatory framework shall provide for:

(i) the establishment of applicable national safety requirements and regulations for radiation safety;

(ii) a system of licensing for spent fuel and radioactive waste management activities;

(iii) a system of prohibition for the operation of a spent fuel or radioactive waste management facility without a license;

(iv) a system of appropriate institutional control, regulatory inspection and documentation and reporting;

(v) the enforcement of applicable regulations and of the terms of the licenses;

(vi) a clear allocation of responsibilities of the bodies involved in the different steps of spent fuel and radioactive waste management.

When considering whether to regulate radioactive materials as radioactive waste, Contracting Parties shall take due account of the objectives of this Convention.

E.2.1 Basic Legislation Governing the Utilization of Nuclear Energy

The basic law on the utilization of nuclear energy in Japan is the Atomic Energy Basic Law that was established in 1955. The objectives of the law are quoted as "to secure future energy resources, achieve progress in science and technology, and promote industry, by encouraging research, development, and the utilization of nuclear energy, and thereby contribute to the improvement of the welfare of human society and the national living standard." The basic policy here is prescribed as follows: "The research, development and utilization of nuclear energy shall be limited to peaceful purposes, on a basis of ensuring priority to safety, and performed on a self-controlled basis under democratic administration, and the results thereof shall be made public and actively contribute to international cooperation."

In order to attain these objectives and achieve the basic policy, the law prescribes the following:

- Establishment of the AEC and the NSC, and their duties, organization, administration, and authorities
- Regulations governing nuclear fuel materials
- Regulations governing the construction, etc. of reactor facility.
- Prevention of radiation hazards

The law also prescribes the assignment of these matters to the respective laws.

E.2.2 Legislative and Regulatory Framework Governing the Safety of Nuclear Utilization

Major laws established for the purpose of providing safety regulations on the utilization of nuclear energy and related laws include "the Law for the Regulation of Nuclear Source Material, Nuclear Fuel Material and Reactors (the Reactor Regulation Law)", "the Electricity Utilities Industry Law," "the Law Concerning Prevention from Radiation Hazards due to Radioisotopes, etc. (the Radiation Hazards Prevention Law)" and "Medical Care Law, etc." Also included are "the Basic Law for Emergency Preparedness," "the Special Law of Emergency Preparedness for Nuclear Disaster," "the Law for Technical Standards of Radiation Hazards Prevention" and "the Specified Radioactive Waste Final

Disposal Act," etc. Overviews of these laws are provided in the following paragraphs.

Apart from the laws mentioned above, "the Law for Establishment of the AEC and the NSC," "the Ministry of Economy, Trade and Industry (METI) Establishment Law," "the Ministry of Education, Culture, Sports, Science and Technology (MEXT) Establishment Law," "the Ministry of Health, Labour and Welfare (MHLW) Establishment Law," "the Japan Nuclear Energy Safety Organization Establishment Law," etc. establish the administrative organizations responsible for the safety regulation of nuclear facilities.

The major laws related to the safety regulation of nuclear facilities are shown in Tables E.2-1 (a) and (b).

(1) The Law for the Regulation of Nuclear Source Material, Nuclear Fuel Material and Reactors (the Reactor Regulation Law) and the Electricity Utilities Industry Law

In accordance with the spirit of "the Atomic Energy Basic Law", the Reactor Regulation Law, to ensure that the uses of nuclear source material, nuclear fuel material, and reactors are limited to peaceful purposes, and carried out in a planned manner, and to ensure public safety by preventing hazards due to them and providing physical protection of nuclear fuel material, provides for:

- Fabrication business for nuclear fuel
- Establishment and operation of reactor facilities
- Storage business for spent fuel
- Reprocessing business for spent fuel
- Disposal business for radioactive wastes
- Use of nuclear fuel material, etc., and
- Regulations regarding off site waste management.

The safety of the management of spent fuel generated in a reactor facility and stored on site, spent fuel stored off site or spent fuel brought into and stored in a reprocessing facility, is regulated by the provisions on the establishment and operation of reactor facilities, by the provisions on the storage business or by the provisions on the reprocessing business, respectively.

As radioactive wastes generated at enrichment and/or fuel manufacturing facilities, reactor facilities, spent fuel storage facilities, reprocessing facilities, fuel material use facilities, etc. are stored or processed in associated facilities of the respective facility, the safety of their management is regulated by the provisions on respective businesses. Meanwhile, the provisions on disposal business regulate the safety of waste disposal and related waste management.

The Reactor Regulation Law stipulates:

- Regulations on basic design or design policy at the time of facility establishment (Licensing)
- Regulations on detailed design at the time of facility construction (Approval of Design and Construction Methods)
- Inspections at the time of facility construction (Welding Inspection, Pre-Service Inspection)
- Regulations at the time of facility operation (Approval of the Safety Preservation Rules, the Nuclear Safety Inspection)
- Inspections of facility during operation (Periodical Inspection of Facility)
- Measures taken for safety preservation of facility

- Record management
- Report collection
- Regulations on facility transfer, and succession or merger of nuclear business operator
- Dismantling of facility
- Safety Verification on Waste Disposal.

The content of major regulations is as follows:

At the time of issuing the License for Establishment of a nuclear facility, the regulatory body conducts an examination to determine adequacy of the site and adequacy of the basic design of structure and equipment from the point of emergency preparedness. In addition, the regulatory body confirms that the nuclear facility will not be used for non-peaceful purposes, that the license will cause no hindrance to planned development and utilization of atomic energy, and that the applicant planning to establish the nuclear facility has sufficient technical capability to ensure safety and sufficient financial basis to execute the plan.

At the time of Approval of the Design and Construction Methods of nuclear facilities, the regulatory body evaluates detailed design to determine whether the structures, system and components to be constructed are in accordance with the above basic design, as well as in compliance with national technical standards.

Moreover, the regulatory body conducts the Pre-Service Inspection and the Welding Inspection of pipes, components, etc. to confirm whether the construction of facilities and the manufacturing of the components are in accordance with the detailed design mentioned above. The regulatory body also conducts, during operation, the Periodical Inspection of Facilities to continually confirm the integrity of the facilities and equipment. The nuclear business operators are required to report and keep operation records.

In the disposal business, the regulatory body confirms whether the radioactive waste disposal facility, the waste packages and the safety preservation measures are in accordance with the technical standards.

At the operation of a nuclear facility, in addition to regulations focusing on the integrity of structural aspects described above, an assessment is also conducted concerning managerial aspects of the nuclear business operator such as the organization, reporting system, operating procedure, equipment maintenance, surveillance, radiation control for personnel, radioactive waste management, radioactive gaseous and liquid waste discharge, radiation monitoring and safety education for personnel. These aspects are comprehensively documented in the Safety Preservation Rules, which shall be examined by the regulatory body for approval. Furthermore, the Nuclear Safety Inspection system was established, and the Nuclear Safety Inspectors who confirms compliance with the Safety Preservation Rules are stationed at each nuclear facility. The Safety Preservation Rules were strengthened to clarify the rules on safety education for personnel. Moreover, the allegation system was established, encouraging personnel to allege violation of safety regulation at nuclear facility without incurring unfavorable treatment.

Some provisions of the Electricity Utilities Industry Law apply to a commercial power reactor facility, which is also an electric structure, while the corresponding provisions of the Reactor Regulation Law are exempted from application.

As shown in Figures E.2-1 (a) and (b), rules and standards are established for each business under the Reactor Regulation Law. When conducting safety examination of a nuclear facility, Examination Guides and various reports (Table E.2-1) established by the NSC are used. Moreover, appropriate

industry association level guidelines, etc. (Table E.2-2) are used as necessary.

(2) The Law Concerning Prevention from Radiation Hazards due to Radioisotopes, etc. (The Radiation Hazards Prevention Law)

The objectives of the Radiation Hazards Prevention Law are to regulate the handling of radioisotopes, radiation generating devices, and material contaminated with radioisotopes, etc., thereby preventing a radiation hazards and ensuring public safety.

As shown in Figure E.2-1 (a) mentioned above, the Ordinance and Rules for the Enforcement of the Law Concerning Prevention from Radiation Hazards due to Radioisotopes, etc. are established under the Radiation Hazards Prevention Law.

A holder of license for sales business, lease business or waste management business issued under the Radiation Hazards Prevention Law, in the case where they either possess a storage facility of a certain size or more or use a radiation generating device, is required to undergo the Pre-Service Inspection and the Periodic Inspection.

Those who use the facility must compile a set of the Internal Rules for Prevention of Radiation Hazards, designate the Supervisor of Radiation Protection, and report these results to the regulatory body before handling commences. Furthermore, those who use the facility have an obligation to conform to the standards for facilities to be used, which have been established by legislation. Other obligations include: measuring the radiation doses within the premises or on the boundary of the business establishment; measuring the exposure doses of the occupational personnel; providing education and training; and conducting health examinations, etc (some nuclear business operators are excluded).

Regarding management of radioisotopes or materials contaminated with such radioisotopes generated from radioisotopes handling business, management must be carried out in conformity with the standards established by laws and regulations within the premises of said place of business or the premises of the place of radioisotope waste management business operator.

When the use of radioisotopes or radiation generating devices is to be abolished, a report describing the measures adopted as part of the abolishing procedures must be submitted to the Minister of MEXT, along with a notice of such abolition

If necessary, MEXT gives instruction for the Radiation Inspectors to conduct an on site inspection in order to ascertain the state of compliance with the standards established by laws and regulations.

(3) Medical Care Law, etc.

Waste business operators designated by the Minister of MHLW conduct radioisotope waste management for medical use, on the basis of the Medical Care Law, the Clinical Laboratory Technicians and Health Laboratory Technicians Law, and the Pharmaceutical Affairs Law.

Site, structure, and equipment of the waste management facilities have to comply with related technical standards in order to be designated by the Minister of MHLW and Welfare.

Furthermore, Periodical Inspection, Radiation Hazard Prevention Rules, conformance order to the standards of waste management facilities, education and training, notification of closure of waste management business, etc, are provided by these laws the same as by the Radiation Hazards Prevention Law.

(4) The Basic Law for Emergency Preparedness and the Special Law of Emergency Preparedness

for Nuclear Disaster

The Special Law of Emergency Preparedness for Nuclear Disaster was established to address special characteristics of nuclear emergency, within the legal framework of the Basic Law for Emergency Preparedness. This special law stipulates special measures for nuclear emergency, including obligation of nuclear business operators to prevent occurrence of nuclear emergency, the Declaration of Nuclear Emergency and establishment of the Nuclear Emergency Response Headquarters, and activation of emergency measures. The Senior Specialist for Nuclear Emergency is stationed in the vicinity of each nuclear facility, to guide and advise the nuclear business operator in preparing its Plan for Nuclear Emergency Preparedness, as well as to conduct its duty to prevent occurrence of nuclear emergency and mitigate consequences should it occur.

Moreover, the nuclear emergency measures in the Basic Plan for Emergency Preparedness on the basis of the Basic Law for Emergency Preparedness clarify measures necessary to prevent occurrence and progression of nuclear emergency, where an abnormal level of radioactivity is released outside the nuclear facility, and to recover from the emergency.

(5) The Law for Technical Standards of Radiation Hazards Prevention

The objectives of the Law for Technical Standards of Radiation Hazards Prevention are to clarify the basic policy for defining technical standards for radiation hazards prevention and to establish the Radiation Review Council within MEXT, so that coordination of technical standards for radiation hazards prevention can be realized. "The Radiation Review Council Orders" are stipulated under the Law for Technical Standards of Radiation Hazards Prevention.

(6) Specified Radioactive Waste Final Disposal Act

Specified Radioactive Waste Final Disposal Act, enacted in May 2000, established an implementing body for disposal, the funds reserved for disposal, the procedure for selecting disposal site, etc., so that the disposal of designated radioactive waste, that is, vitrified waste package from spent fuel reprocessing plant, should be promoted steadily in a planned manner. The Minister of METI determines the basic policy on and the basic plan for disposal. The Nuclear Waste Management Organization of Japan, which is the implementing body, draws up an implementing plan for disposal and carries out the plan. Power reactor operators deposit funds for disposal to the Nuclear Waste Management Organization.

Safety regulation on disposal of specified radioactive waste will be established separately from this act.

E.2.3 Regulatory Framework for the Safety of Spent Fuel Management

As described in Section E.2.2 (1), the safety of management of spent fuel on a reactor facility or a reprocessing facility is regulated by the provisions of the Reactor Regulation Law concerning the establishment and operation of reactor facility or a reprocessing business, respectively. More specifically, spent fuel management facilities are regulated as facilities attached to main facilities operated in the respective business. Details of the safety regulations for spent fuel management are reported in Section G.

On the other hand, safety management of spent fuel stored outside a reactor site or a reprocessing plant site is regulated in accordance with the provisions of the Reactor Regulation Law concerning spent fuel storage business, and provisions on licensing, permission, approval and inspections of a spent fuel storage facility are applied as an independent facility. At present, there is no independent storage facility

in operation, under construction or in the process of license application.

E.2.4 Regulatory Framework for the Safety of Radioactive Waste Management

As described in Section E.2.2 (1), radioactive wastes generated at enrichment and/or fuel manufacturing facilities, reactor facilities, spent fuel storage facilities, reprocessing facilities, fuel material use facilities, etc. are stored or processed in associated facilities to the main, and the safety of their management is regulated by the provisions on respective businesses.

The provisions on disposal business regulate the safety of waste disposal and related waste management. Specified Radioactive Waste Final Disposal Act, mentioned above, provides for the funds reserved for HLW disposal and the procedure for selecting disposal site, leaving safety regulations for HLW disposal to be established separately from the Act. Details of the safety regulations for the radioactive waste management in the disposal business are reported in Section H.

The safety of the radioisotope waste management at facilities licensed under the Radiation Hazards Prevention Law is regulated as described in Section E.2.2 (2).

The safety of the radioactive waste management at facilities licensed under the Medical Care Law, etc. is regulated as described in Section E.2.2 (3), and relevant provisions are similar to those in the Radiation Hazards Prevention Law. Therefore, description of the safety of waste management under the Medical Care Law is omitted in Sections F and thereafter.

E.2.5 The Enforcement of Applicable Regulations and the Terms of the Licenses

The Reactor Regulation Law and the Radiation Hazards Prevention Law prescribes imprisonment and/or fines under circumstances such as establishing a nuclear facility without a License, violating a Shut-Down Order, or failing to take relevant emergency measures. The competent minister, on the basis of the Reactor Regulation Law, the Radiation Hazards Prevention Law or the Medical Care Law, etc., may revoke the License or impose other administrative measures under circumstances such as operating a nuclear facility without a License, violating an order legally issued by the regulatory body, failing to implement measures necessary for safety preservation prescribed by the regulatory body, operating nuclear facility without the Safety Preservation Rules or the Internal Rules for Prevention of Radiation Hazards (the Safety Preservation Rules, etc.) approved by the regulatory body, or failing to comply with the Safety Preservation Rules, etc.

The regulatory body may order changes in the Safety Preservation Rules, etc., whenever it is deemed necessary for preventing accident. License holders failing to abide by such orders could be punished with a fine.

E.2.6 Clear Allocation of Responsibilities in the Different Steps

The regulatory body issues a license to an operator of nuclear business for each of the steps in a series of processes including generation, storage and reprocessing of spent fuel, as well as generation, processing, storage and disposal of radioactive waste. The allocation of responsibilities within the regulatory body that issues license for each of these steps is clearly defined as illustrated in a report of Article 20 (Section E.3.3, Table E.3-1).

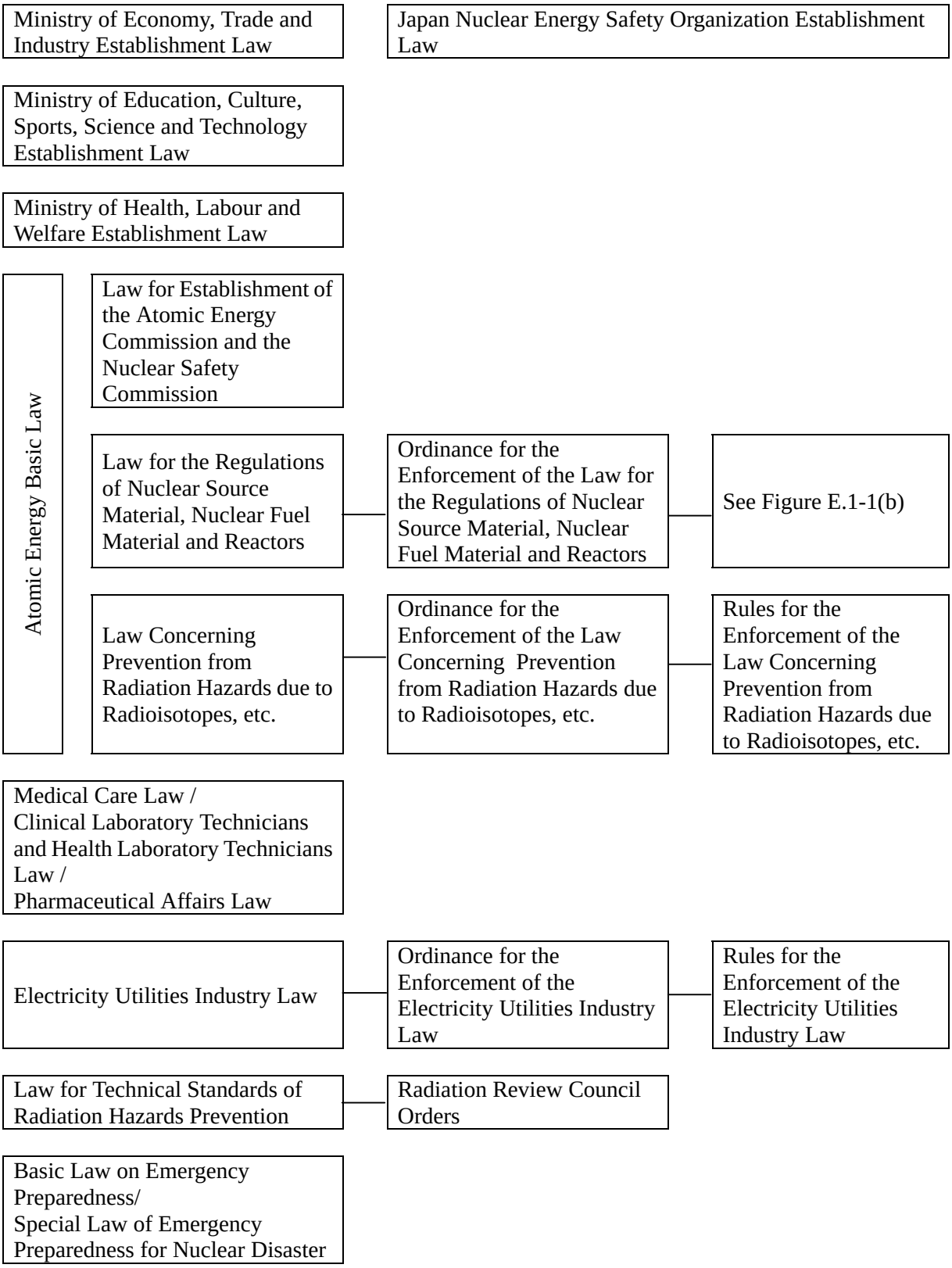

Figure E.2-1(a) Major Laws, etc. for the Safety Regulation of the Nuclear facility

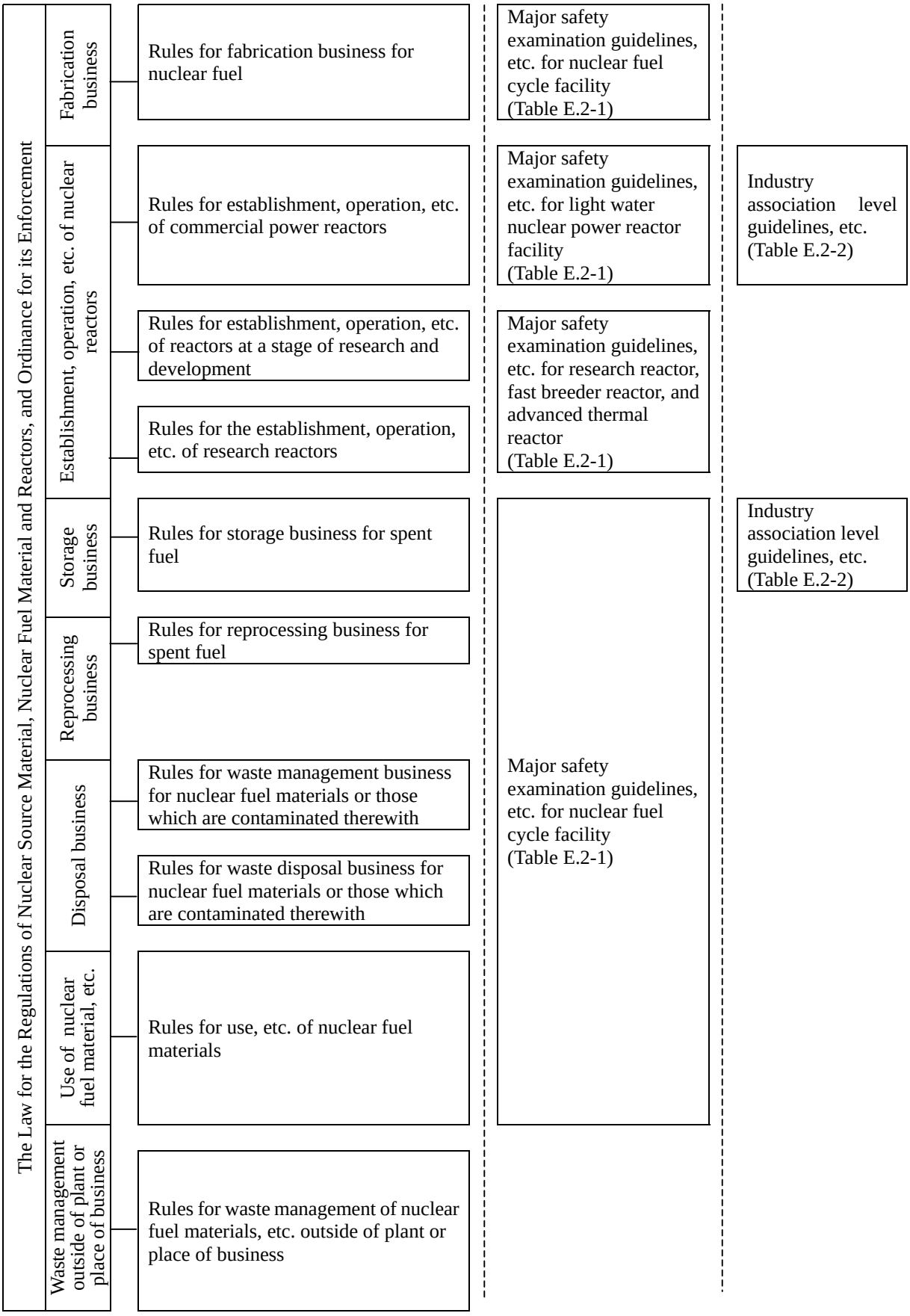

Figure E.2-1(b) Major Laws, etc. for the Safety Regulation of the Nuclear facility

Table E.2-1 Major Safety Examination Guidelines, etc.

For light water nuclear power reactor facility, etc.	
Siting	- Examination guide for nuclear reactor siting evaluation and application criteria
Design	- Examination guide for safety design of light water nuclear power reactor facilities - Examination guide for classification of importance of safety functions for light water nuclear power reactor facilities - Examination guide for seismic design of nuclear power reactor facilities - Examination guide for fire protection of light water nuclear power reactor facilities - Examination guide for radiation measurement in accidents of light water nuclear power reactor facilities - Terms or fundamentals to be considered in the safety examination of liquid radioactive waste processing facilities
Safety evaluation	- Evaluation guide for safety assessment of light water nuclear power reactor facilities - Meteorological guide for safety analysis of nuclear power reactor facilities
Numerical guide for dose	- Numerical guide for dose of general public in the vicinity of light water nuclear power reactor facilities - Evaluation guide for dose of general public in the vicinity of light water nuclear power reactor facilities - Guide for measurement of radioactive materials released from light water nuclear power reactor facilities
For research reactor, fast breeder reactor, advanced thermal reactor, etc.	
Research reactor	- Examination guide for safety design of water cooled research reactor facilities
	- Examination guide for safety evaluation of water cooled research reactor facilities
Fast breeder reactor	- Safety evaluation principles for fast breeder reactor
	- Reference dose for plutonium intake in relation to siting evaluation of reactors with plutonium contained fuel
Advanced thermal reactor	- Principles for safety evaluation of advanced thermal reactor demonstration reactor
Dismantling/decommissioning	- Basic philosophy to assure safety for dismantling nuclear reactor facilities
For nuclear fuel cycle facility	
	- Basic guide for safety examination of nuclear fuel facilities - Safety evaluation guide for uranium fuel fabrication facilities - Examination guide for specific uranium fuel fabrication facilities - Regulatory guide for licensing of reprocessing plants - Reference dose for plutonium intake in relation to siting evaluation of nuclear fuel facilities - Examination guide for uranium and plutonium mixed oxide fuel fabrication facility - Examination guide for spent fuel interim storage facility utilizing dry metal casks - Fundamental guidelines of licensing review of land disposal facility of low-level radioactive waste - Basic philosophy to assess safety of waste management facilities

Source: The collection of safety commission's guidelines

http://nsc.jst.go.jp/anzen/sisin/contents/contents.html

Table E.2-2 Industry Association Level Guidelines, etc.

(Codes and Guides of the Japan Electric Association

Number	Title
JEAG 4101-2000	Guide of Quality Assurance for Nuclear Power Plants
JEAG 4102-1996	Emergency Response Guidelines for Nuclear Power Plants
JEAC 4205-2000	In-service Inspections of Light Water Cooled Nuclear Power Plant Components
JEAG 4207-2000	Ultrasonic Examination for In-service Inspections of Light Water Cooled Nuclear Power Plant Components
JEAG 4209-1996	Guide for Maintenance and Inspection for Nuclear Power Plant Equipment
JEAG 4601-1987	Technical guidelines for Aseismic Design of Nuclear Power Plants
JEAG 4601-1984	Technical guidelines for Aseismic Design of Nuclear Power Plants : Allowable Stress Classification
JEAG 4601-1991	Technical guidelines for Aseismic Design of Nuclear Power Plants: Supplement
JEAG 4603-1992	Guide for Design of Emergency Power Supply Systems for Nuclear Power Plants
JEAG 4604-1993	Guide for Design of Safety Protection System for Nuclear Power Plants
JEAC 4605-1992	Definitions and Engineered Safety Features and Related Systems of Nuclear Power Plants
JEAG 4606-1996	Radiation Monitoring for Nuclear Power Plants
JEAG 4607-1999	Guide for Fire Protection of Nuclear Power Plants
JEAG 4608-1998	Lightning Protection Guidelines for Nuclear Power Plants
JEAG 4609-1999	Application Criteria for Programmable Digital Computer System in the Safety-Related System of Nuclear Power Plants
JEAG 4610-1996	Personal Dose Monitoring for Nuclear Power Plants
JEAG 4611-1991	Guide for Design Instrumentation and Control Equipment with Safety Functions
JEAG 4612-1998	Guide for Safety Grade Classification of Electrical and Mechanical Equipment with Safety Functions
JEAG 4613-1998	Technical Guidelines for Protection Design against Postulated Piping Failures in Nuclear Power Plants
JEAG 4801-1995	Guide for Operating Manual of Nuclear Power Plants
JEAG 4802-2002	Guide for Education and Training for Nuclear Power Plants
JEAG 4803-1999	Guide for Operational Safety Preservation of Light Water Cooled Reactors

(Equipment Standards for Power Reactors by Japan Society of Mechanical Engineers)

Number	Title
JSME S NB1-2001	Welding Standards
JSME S NC1-2001	Design and Construction Standards
JSME S FA1-2001	Structure Standards for Metal Casks

(Standards by Atomic Energy Society of Japan)

Number	Title
AESJ-SC-F002: 2002	Standards for Safety Design and Inspection of Metal Casks for Spent Fuel Interim Storage Facilities: 2002

E.3 Regulatory Body (Article 20)

Each Contracting Party shall establish or designate a regulatory body entrusted with the implementation of the legislative and regulatory framework referred to in Article 19, and provided with adequate authority, competence and financial and human resources to fulfill its assigned responsibilities.

Each Contracting Party, in accordance with its legislative and regulatory framework, shall take the appropriate steps to ensure the effective independence of the regulatory functions from other functions where organizations are involved in both spent fuel or radioactive waste management and in their regulation.

E.3.1 Mandate of the Regulatory Bodies

The mandate of the regulatory bodies is to ensure public safety through securing safety of nuclear facilities, and their duties are to implement the legislative and regulatory framework described in the report of Article 19. The regulatory bodies are responsible for conducting regulatory activities prescribed in the Reactor Regulation Law, the Radiation Hazards Prevention Law, etc. on the basis of the Atomic Energy Basic Law. Their organizations and assigned duties are clearly defined in their respective establishment laws, and their financial resources are covered by the national budget.

The Minister of METI serves as the competent minister for safety regulation over all activities concerning utilization of nuclear energy, and NISA administers the regulatory activities as a special organization for METI. Moreover, the Minister of MEXT serves as the competent minister for the safety regulation over the nuclear utilization associated with science and technology and the utilization of radioisotopes (except medicines, etc.), etc., and the STPB administers the regulatory activities. The Minister of Health, Labor and Welfare governs the safety regulation concerning medical facilities as the competent minister, and the PFSB and the HPB administer the regulatory activities.

These regulatory bodies have clearly defined duties on safety regulation, and their effective independence is ensured both in legislation and in substance. Furthermore, in the regulatory procedure on the utilization of nuclear energy and research reactor facilities, the NSC, with five members who are appointed by the Prime Minister with the consent of the Diet, independently monitors and reviews the regulatory activities conducted by the regulatory body concerned.

E.3.2 The Structure of the Regulatory Body and Supporting Organizations

(1) Nuclear and Industrial Safety Agency (NISA)

The Minister of METI, as the competent minister stipulated in the Reactor Regulation Law and the Electric Utilities Industry Law, governs the safety regulation over all activities on the utilization of nuclear energy including nuclear power generation, and NISA was established as a special organization of METI to administer the safety regulation.

NISA, under the Minister of METI, has the authority to issue a license for the establishment of a nuclear facility, after conducting safety examination that the siting, structure and equipment has no hindrance to the prevention of disasters

It also has the authority to cancel the license under certain circumstances such as violation of applicable laws and regulations by the license holder.

Within NISA, there are eleven divisions that administer safety regulations for nuclear facility associated with utilization of nuclear energy. The assigned duties of each of these divisions are illustrated in Table E.3-1. The Nuclear Safety Inspectors are assigned to resident position at each nuclear facility, with duties to conduct the Nuclear Safety Inspection four times a year to confirm compliance with the Safety Preservation Rules by the operator, and to address abnormal events if they occur. The locations of offices of the Nuclear Safety Inspectors are illustrated in Figure E.3-1 and Table E.3-2.

Staff members who are in charge of nuclear safety regulation are required to have expertise in nuclear technology. Knowledgeable and experienced persons are constantly recruited from outside, and specialized and advanced education and training programs are implemented. Staff members are provided with opportunities to attend international meetings or take long-term assignments of working in international organizations, etc
Moreover, NISA maintains and develops its ability, as well as contributes to improve international nuclear safety regulation, through exchange of technical experts and information on safety regulation and safety technology, under bilateral cooperation arrangements with foreign regulatory bodies and in the framework of multilateral cooperation (IAEA and OECD/NEA).

On the basis of METI Establishment Law, the Advisory Committee for Natural Resources and Energy is established, a subcommittee of which is the Nuclear and Industrial Safety Subcommittee that proposes policies on nuclear safety and safety of electric power as the terms of reference. The organization of the Subcommittee is illustrated in Table E.3-3. The experts in the Subcommittee are assigned based on their knowledge and experience in specialized fields including nuclear and thermal-hydraulic design, system design, seismic design, radiation control, radioactive waste disposal, etc., and when necessary, NISA solicits the views of these experts about what ensuring safety should be.

NISA entrusts the Institute of Nuclear Safety of Nuclear Power Engineering Corporation (NUPEC) with siting evaluation and safety evaluation during accidents, which is an evaluation made by a party other than the applicant. Japan Power Engineering and Inspection Corporation and four other organizations are the designated organizations for Welding Safety Management Inspections, and the Nuclear Safety Technology Center is the designated organization for the Safety Verification of Waste Disposal, etc.

A law for the establishment of an incorporated administrative agency, "Japan Nuclear Energy Safety Organization" as a technical support organization of NISA was approved in December 2002 by the Diet. The objectives of this organization, which is scheduled to be established in October 2003, is to provide a foundation for the nuclear safety preservation with regard to utilization of nuclear energy. The scope of work to be performed by the organization includes the following: 1) inspections of nuclear and reactor facilities; 2) analysis and evaluation of safety design for nuclear and reactor facilities; 3) work related to the prevention of occurrence and progression of, and the recovery from, nuclear hazards; 4) study, test, research and training concerning the nuclear safety preservation; and 5) collection, sorting and supply of information.

(2) Science and Technology Policy Bureau (STPB), Ministry of Education, Culture, Sports, Science and Technology (MEXT)

The safety regulation concerning the activities around the nuclear utilization from a scientific and technological aspect and the utilization of radioisotopes (excluding medicines, etc.) is governed by the Minister of MEXT as the competent minister, and is administered by the Science and Technology Policy Bureau (STPB).

With regard to the licensing of a new business under the Reactor Regulation Law and the radioisotope

waste management business under the Radiation Hazards Prevention Law, the Minister of MEXT has the authority to issue the respective licenses, after conducting an examination of the site, structure and equipment from the standpoint of disaster prevention. He or she also has the authority to revoke the licenses under certain circumstances, such as the violation of applicable laws and regulations by the license holder.

STPB contains the Nuclear Safety Division, which has a further three offices. The assigned duties of the divisions and offices are listed in Table E.3-1. Moreover, an inspector for the safety management of nuclear facility shall be assigned to resident position at each research reactor facilities and major fuel material use facilities, whose duties are to conduct examinations and inspections stipulated in the Reactor Regulation Law four times a year to confirm compliance with the Safety Preservation Rules and surveillance of reactor operation management, and to respond to an emergency situation. The locations of offices of Nuclear Safety Inspectors are illustrated in Figure E.3-1.

As to the education and training programs for the staff members in charge of nuclear safety regulations as well as the cooperation with international regulatory organizations, similar arrangements described in section (1) which NISA takes, are adopted, thereby contributing to the improvement of international nuclear safety regulation as well as to the improvement of the nuclear safety regulation by the regulatory bodies in Japan.

The STPB holds advisory committee on nuclear safety regulation, etc. with an objective to contribute to the transparent and efficient administration of nuclear safety by MEXT. Under this committee, sub-committees are held, as listed in Table E.3-4, in order to consider the safety regulations for research reactor, etc, and for radiation under the jurisdiction of MEXT.

As to the activities of the STPB related to the safety regulation for the nuclear facility, Nuclear Safety Technology Center is designated as an organization for welding inspections of the nuclear facility under the Reactor Regulation Law, periodic inspections of the facilities for radioisotope waste management business under the Radiation Hazards Prevention Law, etc.

(3) Ministry of Health, Labour and Welfare (MHLW)

The Ministry of Health, Labour and Welfare (MHLW) administer the safety regulations for radioactive medicines and the regulations for the protection against clinical radiation.

The PFSB exercises jurisdiction over the safety regulations concerning the production of radioactive medicines in conformity with the Regulations for Buildings and Facilities for Pharmacies, etc. and the Regulations for Manufacturing and Handling of Radio Pharmaceuticals based on the Pharmaceutical Affairs Law, and the Regional Bureau of Health and Welfare of the MHLW conducts periodic inspections of manufacturing plants that produce radioactive medicines. And, the PFSB also designates those who can be entrusted by manufacturers of radioactive medicines with the disposal of radioactive materials, while conducting safety regulations concerning the entrustment of the disposal.

As a part of the safeguards in a medical facility, the HPB manages preventive measures against the radiation hazard, standards for the structure and equipment, etc. in the case where the medical facility is equipped with an X-ray device according to the Rules for the enforcement of the Medical Care Law, etc. This enforcement rule also provides standards for the storage, and disposal, etc. of clinical radioisotopes, etc.

E.3.3 Nuclear Safety Commission (NSC)

The Nuclear Safety Commission (NSC), which was established within the Cabinet Office under the

Atomic Energy Basic Law, consists of five members who are appointed by the Prime Minister with the consent of the Diet. The chairperson is elected by mutual vote.

The NSC has duties of planning, deliberation and decisions on matters that are related to ensuring safety of the utilization of nuclear energy, and establishes guidelines to be used at the safety examination.

If the NSC deems it necessary as part of its assigned duties, it may advise, and request reports and cooperation including the submission of materials, statement of views, and explanation from, the heads of relevant administrative organization by way of the Prime Minister.

Before the regulatory body issues an establishment license for nuclear facility (excluding fuel material use facility and RI facility), the competent minister inquires about the opinions of the NSC on whether the applicant has adequate technical capability, and whether the site, the structure and the equipment of the nuclear facility are adequate for preventing nuclear accidents. The NSC responds to the inquiries by conducting independent investigation.
Furthermore, at construction and operational stage of the nuclear facility, the NSC receives quarterly reports from the regulatory body on the changes of the Safety Preservation Rules, the compliance with the Safety Preservation Rules by the operator, results of the Periodical Inspection of Facility, etc. And the NSC independently monitors and reviews the situation and adequacy of the regulatory activities
The NSC has a secretariat in the Cabinet Office. The Secretariat of the NSC is composed of the Secretary-General, the General Affairs Division, the Regulatory Guides and Review Division, the Radiation Protection and Accident Management Division and the Subsequent Regulation Review Division. Under the NSC, two Committees for Examination, eight Special Committees and others are organized, as shown in Table E.3-5.

E.3.4 Other Administrative Bodies

(1) The Atomic Energy Commission (AEC)

The Atomic Energy Commission (AEC) consists of the chairperson and four other members appointed by the Prime Minister with the consent of the Diet.

The AEC has duties of planning, deliberation and decisions concerning the research, development and utilization of nuclear energy (excluding safety regulations).

If the AEC deems it necessary as part of its assigned duties, it may advise, and request reports and cooperation including the submission materials, statement of views, and explanation from, the heads of relevant administrative organizations by way of the Prime Minister. Furthermore, before the regulatory body issues an establishment license for a nuclear facility (excluding fuel material use facility), the competent minister inquiries about the opinions of the AEC on whether the nuclear facility will be used for peaceful purposes, whether the license is in line with the planned development or utilization of nuclear energy, and whether the applicant has an adequate financial basis to construct and maintain the nuclear facility.

(2) Radiation Review Council

The Radiation Review Council is established within MEXT under "the Law for Technical Standards of Radiation Hazards Prevention" so that coordination of technical standards for radiation hazards prevention is realized. When drawing up technical standards for radiation hazard prevention, the council deliberates with the basic policy that the radiation doses received by occupational personnel and the general public be less than that may cause any hazards. The council answers inquiries from the heads of relevant administrative organizations, and can present its opinion to the heads of such

organizations.

The Radiation Review Council consists of a maximum of 20 members, and a basic committee composed of experts from different fields is established under the council.

(3) Others

As the establishment of a nuclear facility involves requirements of laws such as the Fire Protection Law, the Port Regulation Law, etc., the Fire Protection Agency, the Ministry of Land, Infrastructure and Transport, and other competent administrative bodies administer the related regulations.

The Basic Law for Emergency Preparedness, the Special Law of Emergency Preparedness for Nuclear Disaster and related regulations apply to a nuclear emergency. Administrative bodies having jurisdiction over these laws are described in Section F.5 (Article 25).

Table E.3-1 The Allocated Duties of Safety Regulation Related Divisions of Nuclear Facilities

1. Nuclear and Industrial Safety Agency, Ministry of Economy, Trade and Industry
(Director-General, Deputy Director-General, Inspectors, Senior Safety Examiner, Divisions, Offices Approx. 400 members)

Policy Planning and Coordination Division	General management of NISA
Nuclear Safety Regulatory Standard Division	Planning and coordination of the matters relating to technical and institutional affairs concerning securing the nuclear safety. Regulations of power reactors at the stage of research and development.
Nuclear Safety Special Investigation Division	Management of allegation and litigation concerning nuclear safety
Nuclear Safety Administration Division	Administration of Nuclear Safety Inspectors and Senior Specialists for Nuclear Emergency
Nuclear Power Licensing Division	Regulations of commercial power reactors in establishment stage
Nuclear Power Inspection Division	Regulations of commercial power reactors in construction and operation stage
Nuclear Fuel Cycle Regulation Division	Regulations of milling , fuel fabrication and reprocessing business
Nuclear Fuel Transport and Storage Regulation Division	Regulations of spent fuel storage business; Regulations of off-site transportation of nuclear fuel materials
Radioactive Waste Regulation Division	Regulations of radioactive waste disposal business, and dismantling of nuclear facilities (including fuel cycle facilities)
Nuclear Emergency Preparedness Division	Establishing measures to deal with a nuclear emergency; Response to failures and incidents at nuclear facilities
Electric Power Safety Division	Regulations for turbines, etc.; Environmental impact assessment

* In addition, Offices of Inspectors for Safety Management of Nuclear Installations are located throughout the country, where the Nuclear Safety Inspectors are stationed. The inspectors belong to Nuclear Power Inspection Div., Nuclear Safety Regulatory Standard Div., Nuclear Fuel Cycle Regulation Div., or Radioactive Waste Regulation Div.

2. Ministry of Education, Culture, Sports, Science and Technology; Science and Technology Policy Bureau
(Director-General, Deputy Director-General, Nuclear Safety Division, Offices; 89 members in total)

Nuclear Safety Division	General management of Nuclear Safety Division
Nuclear Safety Division Office for Nuclear Regulation	Regulations for research reactor facility and fuel material use facility
Nuclear Safety Division Office for Radiation Regulation	Regulations for radioisotopes, etc.
Nuclear Safety Division Office for Emergency Planning and Environmental Radioactivity	Nuclear emergency measures Environmental radiation measures

* In addition, Offices of Inspectors for Safety Management of Nuclear Installations are located throughout the country, where Nuclear Safety Inspectors are stationed to perform safety inspections and belong to Office for Nuclear Regulation

3. Ministry of Health, Labour and Welfare

Pharmaceutical and Food Safety Bureau, General Affairs Division	Regulations concerning the entrustment of disposal of radioactive medicines, etc.
Pharmaceutical and Food Safety Bureau, Safety Division	Provision of preventive measures against the radiation hazard and regulations for the structure and equipment, etc. in the case where the medical facility is equipped with an X-ray device, etc.
Pharmaceutical and Food Safety Bureau, Compliance Division	Regulations for Manufacturing, etc. of Radioactive Medicines

Table E.3-2 Nuclear Facilities covered by Offices of Nuclear Safety Inspectors and Offices of Nuclear Safety Management

Offices of Inspectors for Safety Management of Nuclear Installations	Nuclear Facilities
- Tomari Office of the Inspectors for Safety Management of Nuclear Installations	- Tomari Power Station (Hokkaido Electric Power Co., Inc.)
- Rokkasho Office of the Inspectors for Safety Management of Nuclear Installations	- Reprocessing Business Division, - Enrichment Business Division, - Radioactive Waste Disposal Business Division (Japan Nuclear Fuel Limited)
- Kashiwazaki-Kariwa Office of the Inspectors for Safety Management of Nuclear Installations	- Kashiwazaki-Kariwa Nuclear Power Station (Tokyo Electric Power Co., Inc.)
- Shika Office of the Inspectors for Safety Management of Nuclear Installations	- Shika Nuclear Power Station (Hokuriku Electric Power Co., Inc.)
- Tsuruga Office of the Inspectors for Safety Management of Nuclear Installations	- Tsuruga Power Station (The Japan Atomic Power Co.) - Monju Construction Office (Japan Nuclear Cycle Development Institute) -Fugen Nuclear Power Station (Japan Nuclear Cycle Development Institute)
- Mihama Office of the Inspectors for Safety Management of Nuclear Installations	- Mihama Power Station (The Kansai Electric Power Co., Inc.)
- Ohi Office of the Inspectors for Safety Management of Nuclear Installations	- Ohi Power Station (The Kansai Electric Power Co., Inc.)
- Takahama Office of the Inspectors for Safety Management of Nuclear Installations	- Takahama Power Station (The Kansai Electric Power Co., Inc.)
- Shimane Office of the Inspectors for Safety Management of Nuclear Installations	- Shimane Nuclear Power Station (The Chugoku Electric Power Co., Inc.)
- Kamisaibara Office of the Inspectors for Safety Management of Nuclear Installations	- Ningyo-Toge Environmental Engineering Center (Japan Nuclear Cycle Development Institute)
- Genkai Office of the Inspectors for Safety Management of Nuclear Installations	- Genkai Nuclear Power Station (Kyushu Electric Power Co., Inc.)
- Ikata Office of the Inspectors for Safety Management of Nuclear Installations	- Ikata Power Station (Shikoku Electric Power Co., Inc.)
- Sendai Office of the Inspectors for Safety Management of Nuclear Installations	- Sendai Nuclear Power Station (Kyushu Electric Power Co., Inc.)
- Hamaoka Office of the Inspectors for Safety Management of Nuclear Installations	- Hamaoka Nuclear Power Station (Chubu Electric Power Co., Inc.)
- Osaka Branch Office of the Inspectors for Safety Management of Nuclear Installations	- Atomic Energy Research Institute (Kinki University)
- Kumatori Office of the Inspectors for Safety Management of Nuclear Installations	- Kumatori Works (Nuclear Fuel Industries, Ltd.)
- Osaka Office of the Inspectors for Safety Management of Nuclear Installations	- Research Reactor Institute (Kyoto University)
- Onagawa Office of the Inspectors for Safety Management of Nuclear Installations	- Onagawa Nuclear Power Station (Tohoku Electric Power Co., Inc.)
- Fukushima No.1 Office of the Inspectors for Safety Management of Nuclear Installations	- Fukushima Daiichi Nuclear Power Station (Tokyo Electric Power Co., Inc.)
- Fukushima No.2 Office of the Inspectors for Safety Management of Nuclear Installations	- Fukushima Daini Nuclear Power Station (Tokyo Electric Power Co., Inc.)

Offices of Inspectors for Safety Management of Nuclear Installations	Nuclear Facilities
- Tokai Oarai Office of the Inspectors for Safety Management of Nuclear Installations	- Tokai-1, 2 Power Station (The Japan Atomic Power Co.) - Nuclear Fuel Industries, Ltd. Tokai Works (Mitsubishi Nuclear Fuel Co., Ltd.) - Tokai, Oarai Research Establishment (Japan Atomic Energy Research Institute) - Tokai Engineering Center (Japan Nuclear Cycle Development Institute)
- Ibaraki Office of the Inspectors for Safety Management of Nuclear Installations	- Tokai Works (Nuclear Fuel Industries, Ltd.) - (Mitsubishi Nuclear Fuel Co., Ltd.) - Tokai, Oarai Research Establishment (Japan Atomic Energy Research Institute) - Tokai, Oarai Engineering Center (Japan Nuclear Cycle Development Institute) - Tokai Safeguards Center (Nuclear Material Control Center) - Fuel Hot Laboratory (Nuclear Development Corporation) - NFD Hot Laboratory (Nippon Nuclear Fuel Development Co., Ltd.) - Nuclear Engineering Research Laboratory, Graduate School of Engineering (The University of Tokyo)
- Kanagawa Office of the Inspectors for Safety Management of Nuclear Installations	- Research Reactor Center, - Nuclear Engineering Laboratory (Toshiba Corporation) - Power & Industrial Systems R&D Laboratory Ozenji Branch Section (Hitachi, Ltd.) - Hitachi Training Reactor (Hitachi Engineering Co., Ltd.) - Atomic energy Research Laboratory (Musashi Institute of University)
- Yokosuka Office of the Inspectors for Safety Management of Nuclear Installations	(Global Nuclear Fuel - Japan Co., Ltd.)
- Kanagawa Minami Office of the Inspectors for Safety Management of Nuclear Installations	- Institute for Atomic Energy (Rikkyo University)

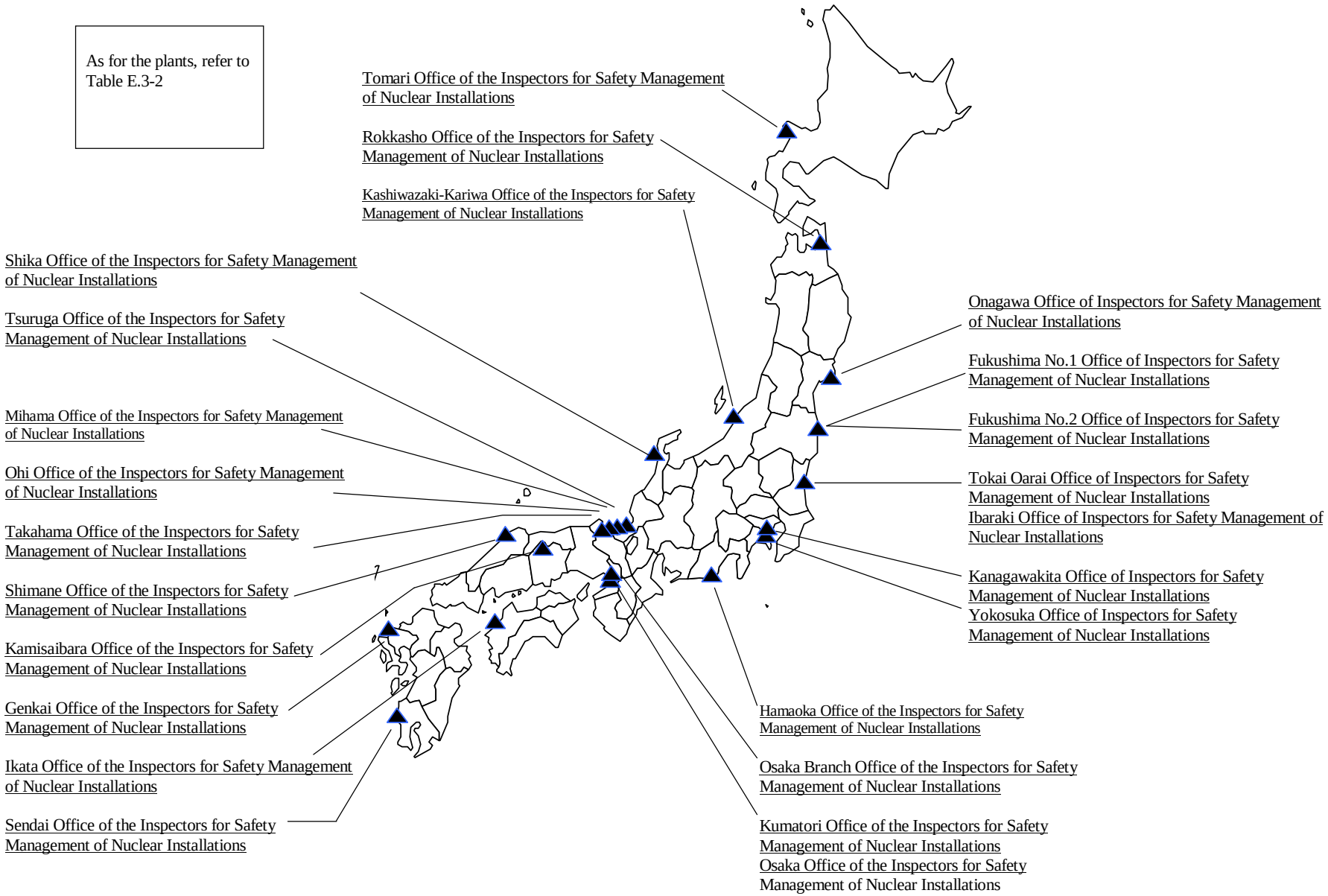

Figure E.3-1 The Locations of Offices of Inspectors for Safety Management of Nuclear Installations

Table E.3-3 The Organization of the Nuclear and Industrial Safety Subcommittee

Basic Safety Policy Subcommittee	General matters securing safety
Nuclear Reactor Safety Subcommittee	Technical matters on commercial power reactors at the stage of research and development
Nuclear Fuel Cycle Safety Subcommittee	Fabrication and reprocessing of nuclear fuel, storage of spent fuel, transportation of nuclear fuel material, and the technical standards
Decommissioning Safety Subcommittee	Decommissioning of nuclear facilities
Radioactive Waste Safety Subcommittee	Securing safety of disposal and storage of radioactive waste
Soil and Earthquake Engineering Subcommittee	Technical matters on seismic design of nuclear facilities
Nuclear facility Operation Management and Emergency Preparedness Subcommittee	Technical matters in operation, incidents and accidents, and emergencies of nuclear facilities
INES Evaluation Subcommittee	Assessment of incidents and accidents against INES scale
Subcommittee for the Convention on Nuclear Safety	Matters related to the Convention on Nuclear Safety and international standards on nuclear safety
Electric Power Safety Subcommittee	Securing safety of electrical power r
Subcommittee on Appropriateness of the Inspection System	Appropriateness of the inspection systems concerning nuclear power generation facilities and nuclear fuel cycle facilities
Subcommittee for the Convention on the Nuclear Safety of Radioactive Waste Management, etc.	Matters concerning Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management
Subcommittee for Legislation for Nuclear Safety Regulation	Consideration of necessary legal systems, etc. for the verification of background and the prevention of recurrence, in the case of malpractice such as alteration of self-controlled inspection records
Subcommittee for Integrity Assessment of Nuclear Power Generation Equipment	Evaluation of plant integrity when cracks are found in the core shroud, etc.

Table E.3-4 Subordinate Organization of Advisory Committee on Nuclear Safety Regulation, etc.

Subcommittee on Safety Regulation for ITER	Directions for safety regulation of ITER
Subcommittee on Safety Regulation for Research Reactors, etc.	Directions for safety regulation of research reactors, nuclear source materials, etc.
Subcommittee on Safety Regulation for Radiation	Directions for radiation safety regulation

Table E.3-5 List of Special Committees within the Nuclear Safety Commission

Committee on Examination of Reactor Safety	- Matters concerning the safety of nuclear facilities
Committee on Examination of Nuclear Fuel Safety	- Matters concerning the safety of nuclear fuel materials
Emergency Technical Advisory Body	- Technical advice in nuclear emergency
Special Committee on Comprehensive Nuclear Safety	- Safety regulation of radioactive waste - Safety of transportation of radioactive materials - Regulation of technical ability of licensees - Accident management - Safety of dismantling of nuclear facilities - Measures against aging of nuclear facilities - Risk assessment - Others -
Special Committee on Safety Goal	- Safety goal, including quantitative goal with practical use of probabilistic safety assessment, etc.
Special Committee on Fundamentals of Prevention of Radiation Hazards	- Fundamentals of prevention of radiation hazards, and securing safety of radioisotopes - Environmental radiation monitoring in the vicinity of nuclear facilities and survey of general radioactive levels -
Special Committee on Safety Standards	- Standards and guides of reactors, nuclear fuel facilities, intermediate storage facilities of spent fuel, etc. - Standards and guides of radioactive waste - Others
Special Committee on Nuclear Safety Research	- Planning of annual safety research program - Implementation of annual safety research program - Review of safety research program
Special Committee on Investigation of Nuclear Accident and Failures	- Analysis and evaluation of accidents and incidents domestic and abroad - Investigation of specific accidents and incidents indicated by the NSC, and assessment of the measures taken
Emergency Technical Advisory Body on Countermeasure for Disaster by the Nuclear Warship	- Matters concerning the technical advice on emergency countermeasures for the possible or actual cases of nuclear disaster by the nuclear warship.
Special Committee on Nuclear Emergencies.	- Technical and expert matters on emergency measures taken in nuclear emergencies
Committee on Safety Investigation of Special Radioactive Waste	- Investigation and deliberation of technically essential aspects for safety assurance of HLW disposal
Special Advisory Board for International Activities on Radiation Protection	- Matters pertaining to the technical aspects of international contribution on the subject of radiation protection
Project Team on the Safety Assessment of the Nuclear Power Plant	- Matters pertaining to the safety assessment of various facilities and equipments of the nuclear power plants of Tokyo Electric Power Company (TEPCO), etc, especially regarding the cracks that were made public following the disclosure of TEPCO's falsified safety report.
Project Team for Regulatory Review of Reprocessing Facility Safety	- Check and review to the regulatory activities for the Rokkasho - Reprocessing Plant during its operational tests.

F. Other General Safety Provisions

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Section F. Other General Safety Provisions

F.1 Responsibility of the Licence Holder (Article 21)

1. Each Contracting Party shall ensure that prime responsibility for the safety of spent fuel or radioactive waste management rests with the holder of the relevant licence and shall take the appropriate steps to ensure that each such licence holder meets its responsibility.

2. If there is no such licence holder or other responsible party, the responsibility rests with the Contracting Party which has jurisdiction over the spent fuel or over the radioactive waste.

F.1.1 Responsibility of the Licence Holder

The prime responsibility for the safety of a nuclear facility including the safety of spent fuel or radioactive waste management rests with the licence holder of the nuclear facility. That is, the licence holder is responsible for adopting necessary measures to fully meet the regulatory requirements stipulated either in the Reactor Regulation Law, the Electricity Utilities Industry Law or the Radiation Hazards Prevention Law, etc. at all of the stages of planning, establishment, operation and maintenance of the nuclear facility, as described in Sections G and H. In addition to meeting with regulatory requirements, the licence holder is required to make efforts for improving safety and reliability of the nuclear facility, through implementing education and training programs of personnel, preparing operation manuals, collecting, studying and sharing information on operating experience and applying it to design, operation and maintenance, adopting the latest progress in technology, performing safety research, and promoting quality assurance activities.

F.1.2 Steps to Ensure that Each Licence Holder Meets its Responsibility.

Steps to ensure that each licence holder meets its responsibility are shown below. The details are described in Sections G and H.

The regulatory body regulates licence holders' activities at all of the stages of a nuclear facility in accordance with the regulations provided by the Reactor Regulation Law, the Electricity Utility Industry Law or the Radiation Hazards Prevention Law. Especially in the stage of establishment of a major nuclear facility, the competent minister examines the location, structure and the equipment are such that the occurrence of disaster can be prevented, and issue the licence.

The regulatory body, on the basis of the Reactor Regulation Law or the Electricity Utilities Industry Law, conducts the Periodical Facility Inspection to confirm nuclear facility's compliance with the technical standards, and the Nuclear Safety Inspection to confirm licence holder's compliance with the Safety Preservation Rules. Also, it may conduct the On-the-Spot Inspection as necessary. In case the business operator does not observe the Safety Preservation Rules, the regulatory body has authority to revoke the licence or order shutdown of the operation.

For the radioisotope waste management facilities subject to the Radiation Hazards Prevention Law, the regulatory body conducts the Periodical Inspection to confirm nuclear facility's compliance with the technical standards, and the Radiation Inspector conducts the On-the-Spot inspection of a use facility as necessary. In case the business operator does not observe provisions of the Radiation Hazards Prevention Law, regulatory body has authority to revoke the licence or order shutdown of the operation

In addition, on the basis of the Reactor Regulation Law and the Electricity Utilities Industry Law, the licence holder shall cooperate inquiry by the NSC when the NSC reconfirms the adequacy of the

activities of the regulatory body

F1.3 Steps Taken against Absence of the License Holder

In Japan, the management of spent fuel and radioactive waste are subject to the licence issued under the Reactor Regulation Law or the Radiation Hazards Prevention Law. The laws include provisions on succession of a license or steps to be taken by liquidator or administrator in bankruptcy, ensuring safety of spent fuel management or radioactive waste management in such a case.

A license holder of radioisotope waste management facility issued under to the Medical Care Law etc. is allowed to close its business operation only after it completes necessary measures for the closure of business stipulated by the law.

F.2 Human and Financial Resources (Article 22)

Each Contracting Party shall take the appropriate steps to ensure that:
(i) Qualified staff are available as needed for safety-related activities during the operating lifetime of a spent fuel and a radioactive waste management facility;
(ii) Adequate financial resources are available to support the safety of facilities for spent fuel and radioactive waste management during their operating lifetime and for decommissioning;
(iii) Financial provision is made which will enable the appropriate institutional controls and monitoring arrangements to be continued for the period deemed necessary following the closure of a disposal facility.

F.2.1 Human Resources of a Licence Holder to Maintain Major Nuclear Facilities

(1) Human Resources

In issuing establishment licence of a nuclear facility, the regulatory body confirms that the applicant possesses technical capability necessary to establish and operate it adequately. (Exempted are the reprocessing activities by JNC and JAERI, two national institutes established by legislation.)

The applicant for a license under the Reactor Regulation Law attaches an explanation on its technical capability to the application format. Following is an example of items to be included for reprocessing business licence.

1) Curriculum vitae of major technical experts
2) Other items concerning technical capability relating reprocessing
   a. Information on technical experts
      a) departments and divisions in charge of reprocessing
      b) the number of engineers
      c) experience of engineers (years engaged in nuclear field)
      d) the number of qualified staff including the Supervisors of Nuclear Fuel and the Class 1 Supervisors of Radiation Protection.
      e) the number of engineers trained in domestic and foreign training courses
   b Training program of technical experts
      a) on-the-job training program for technical experts through operation and maintenance of a reprocessing facility
      b) operation training at reprocessing facilities in domestic and/or foreign plants and at nuclear power plants, improvement of technical capability and management capability through on-the-job training

The operator of facilities licensed under the Radiation Hazards Prevention Law, before starting their facility operation, appoints the Supervisor of Radiation Protection and prepares the Internal Rules for Prevention of Radiation Hazards in which safety management of radioisotopes, work scope and organization of workers, and education and training programs are provided.

(2) Qualification of Personnel Engaged in Safety Activities

Any operator of facilities licensed under the Reactor Regulation Law appoints, and notifies the regulatory body of, a Chief Engineer of Reactors to supervise safety preservation in the operation of a reactor facility, a Chief Nuclear Fuel Engineer to supervise safety preservation in the operation of a nuclear fuel fabrication facility or a reprocessing facility, a Supervisor of Spent Fuel to supervise safety preservation in the handling of spent fuel in a spent fuel storage facility and a Supervisor of Radioactive Waste to supervise safety preservation in the handling of nuclear fuel materials etc. in

radioactive waste management facilities.

Any operator of facilities licensed under the Radiation Hazards Prevention Law appoints, and notifies the regulatory body of, the Supervisor of Radiation Protection to supervise prevention of radiation hazards, before starting facility operation.

(3) Staff Training and Retraining

Any operator of facilities licensed under the Reactor Regulation Law is requested to provide following items concerning training and education, in the Safety Preservation Rules.

1) matters relating to regulations and the Safety Preservation Rules
2) structure, performance and the operation of the facility
3) matters relating to radiation management
4) matters relating to the handling of nuclear fuel materials and material contaminated with nuclear fuel material
5) steps to be taken in the case of emergency

Any operator of facilities licensed under the Radiation Hazards Prevention Law is requested to provide education and training programs on the following items

1) radiation impact on human body
2) safe handling of radioisotopes
3) regulation relating to the prevention of radiation hazards due to radioisotopes
4) Internal Rules for Prevention of Radiation Hazards

F.2.2 Financial Resources and Financial Rules

In issuing establishment licence of a nuclear facility (except for the nuclear fuel material use facility) the regulatory body, in accordance with the Reactor Regulation Law, confirms that the applicant for the licence possesses necessary financial basis. For example, it requires applicant for reprocessing business to submit “Amount of Funds Required for Construction and Finance Procurement Plan” and “Financial Plan and Estimated Annual Financial Balance for the First Decade After the Commissioning of Reprocessing Business” as attached to the application format.

Electric utilities deposit funds for reprocessing of spent fuel and decommissioning on the basis of the Ministerial Order concerning Reserves for Reprocessing of Spent Fuel and Decommissioning Nuclear Power Generation Facilities established under the Electricity Utilities Industry Law.

In accordance with the Specified Radioactive Waste Final Disposal Act enacted in May 2000, operators of power reactor facilities deposit funds for disposal of high level radioactive waste to the Nuclear Waste Management Organization of Japan, the implementing body for disposal, who entrusts management of the fund to the Radioactive Waste Management Funding and Research Center.

Financial basis of a license holder of fuel material use is to be confirmed through procedures to approve the Safety Preservation Rules and the steps to be taken at the time of decommissioning.

Financial Basis of the operator of radioisotope waste management facility licensed under the Radiation Hazards Prevention Law is to be confirmed through the Periodical Inspection, obligation to maintain the facility in compliance with technical standards, implementation of education and training programs, notification of the Internal Rules for Prevention of Radiation Hazards and the steps to be taken at the time of decommissioning.

F.3 Quality Assurance (Article 23)

Each Contracting Party shall take the necessary steps to ensure that appropriate quality assurance programmes concerning the safety of spent fuel and radioactive waste management are established and implemented.

F.3.1 Regulatory Activities to Ensure Appropriate Quality Assurance (QA) Programs

The regulatory body, on the basis of the Regulation Law, the Electricity Utilities Industry Law and the Radiation Hazards Prevention Law, requests a license holder, or an applicant for a license, to submit relevant documents at every stage of license application, construction, operation and decommissioning, and confirms the license holder's technical capability including quality assurance (QA). The regulatory activity at each stage is as follows.

(1) Examination of the Policy for QA at business licensing

The regulatory body requests the applicant to submit the "Policy for Quality Assurance" attached to the application format, and examines it.

(2) Examination of QA Program in Construction Stage

At the construction stage of a commercial power reactor facility, the regulatory body requests the licence holder to submit the "Description on Quality Assurance Program" as specified in the Rules for the Electricity Utilities Industry Law, which describes licence holder's QA activities through detailed design, manufacturing, installation and functional tests, and examines it. Also, the regulatory body instructs the license holder to promote and oversee subcontractor's quality control, material control, etc., in addition to its QA audit of primary contractor and primary contractor's own management of manufacturing process.

(3) Confirmation of QA Activities Throughout Service Life

Regulatory body confirms QA activities of the licence holder throughout service life of nuclear facility by
1) requesting explanation on QA management plan in the Periodical Inspection, and
2) periodically receiving report on QA activities in the nuclear facility.
3) requiring the licence holder to specify QA program in the Safety Preservation Rules and to comply with it,

F.3.2 Outline of QA Program by Operator of Facilities

Operators prepare and implement QA program at every stage from the licensing to the operation of major nuclear facilities based on JEAG-4101 that is an industrial association level guideline. The QA program covers document management, design control, procurement control, management of inspection and testing, nonconformity management, and audit, etc.

The licence holder submits the "Policy for Quality Assurance" and "Description on Quality Assurance Program" to regulatory body as shown in section F.3.1.

JEAG 4101 refers to the "Quality Assurance for Safety in Nuclear Power Plants" by the IAEA in 1988,

and describes details of QA activities with examples. JEAG 4101 is now being revised in accordance with the IAEA Safety Series 50-C/SG-Q “Quality Assurance for Safety in Nuclear Power Plants and Other Nuclear facilities”.

F.4 Operational Radiation Protection (Article 24)

Each Contracting Party shall take the appropriate steps to ensure that during the operating lifetime of a spent fuel or radioactive waste management facility:

(i) the radiation exposure of the workers and the public caused by the facility shall be kept as low as reasonably achievable, economic and social factors being taken into account;

(ii) no individual shall be exposed, in normal situations, to radiation doses which exceed national prescriptions for dose limitation which have due regard to internationally endorsed standards on radiation protection; and

(iii) measures are taken to prevent unplanned and uncontrolled releases of radioactive materials into the environment.

Each Contracting Party shall take appropriate steps to ensure that discharges shall be limited:

(i) to keep exposure to radiation as low as reasonably achievable, economic and social factors being taken into account; and

(ii) so that no individual shall be exposed, in normal situations, to radiation doses which exceed national prescriptions for dose limitation which have due regard to internationally endorsed standards on radiation protection.

Each Contracting Party shall take appropriate steps to ensure that during the operating lifetime of a regulated nuclear facility, in the event that an unplanned or uncontrolled release of radioactive materials into the environment occurs, appropriate corrective measures are implemented to control the release and mitigate its effects.

F.4.1 Summary of Laws, Regulations and Requirements on Radiation Protection

The national standards for radiation protection at nuclear facilities are prescribed by the Reactor Regulation Law, the Electric Utilities Industry Law, and the Radiation Hazards Prevention Law, etc. and related government ordinances, ministerial ordinances, orders and notifications, and guidelines based on these laws. The recommendations of the International Commission on Radiological Protection (ICRP) are given due consideration and are incorporated into legislation and regulation. The Radiation Review Council coordinates technical standards in the laws and regulations on prevention of radiation hazards.

Ministerial ordinances include the Rules for Enrichment and/or Fuel Manufacturing, the Rules for Commercial Power Reactors, the Rules for Research Reactors, the Rules for Spent Fuel Storage, the Rules for Spent Fuel Reprocessing, the Rules for Waste Disposal, the Rules for Waste Management and the Rules for Fuel Material Use on the basis of the Reactor Regulation Law, and the Rules for the Enforcement of the Law Concerning Radiation Hazards Prevention and other rules on the basis of the Radiation Hazards Prevention Law. These regulations prescribe area control for radiation protection, radiation control of personnel engaged in radiation controlled areas, measurement and surveillance of radiation levels, monitoring of discharged radioactive materials, and maintenance of radiation control equipment. The Notification for Dose Limits on the basis of each of these rules prescribes dose limits and concentration limits of radioactive materials both inside controlled area and outside peripheral monitoring area, and dose limits and concentration limits of radioactive materials for personnel engaged in radiation work, and dose limits for personnel engaged in emergency activities.

In order to ensure compliance with these regulations, operators are required to prescribe in the Safety

Preservation Rules, 1) controlled areas, conservation areas and peripheral monitoring area and access control to these areas, 2) monitoring equipment at air ventilation and water discharge, 3) monitoring of the dose, dose equivalent, the concentration of radioactive materials in the air and the density of radioactive materials on the surface of contaminated objects, and the decontamination, and 4) maintenance of radiation monitoring equipment. In examining application of a license for a nuclear facility, it is confirmed that the application conforms to the Examination Guides established by the NSC as well as the legislation and technical standards. In these guides, operators are required to reasonably reduce discharge of radioactive materials from a nuclear facility into environment and the dose to the public.

F.4.2 National Requirements on Radiation Protection and the Implementation

(1) Allowable Dose Limits

1) Definition of Controlled Areas

The abovementioned rules and dose limit notifications define a controlled area as an area where dose of external radiation may exceed 1.3mSv for a period of three months, the concentration of radioactive material in the air may exceed the limit specified in the notification, or the density of radioactive material on the surface of contaminated objects may exceed the limit specified in the notification, and request operators to take necessary measures in the area.

2) Allowable Dose Limits for Occupational Exposure

The abovementioned rules and dose limit notifications provide for the allowable dose limits for occupational exposure listed in Table F. 4-1.

Table F.4-1 Dose limits for personnel engaged in radiation work

Items	Limits
1. Effective dose limits	
(1)Personnel engaged in radiation work	100mSv/5 years but do not exceed 50mSv/1 year
(2)Female personnel	In addition to the provision (1), 5mSv/3 months
(3)Pregnant female personnel	In addition to the provision (2), 1mSv for internal exposure during a period from notification of pregnancy to delivery
2. Equivalent dose limits	
(1)Eye lens	150mSv/1 year
(2)Skin	500mSv/1 year
(3)Pregnant female's abdominal region	2mSv during a period from notification of pregnancy to delivery
3. Dose limits for the personnel engaged in emergency radiation work	
(1)Effective dose limits	100mSv
(2)Equivalent dose limits for eye lens	300mSv
(3)Equivalent dose limits for skin	1Sv

3) Dose Limits for the Public

The abovementioned rules and dose limit notifications provide for the allowable dose limits for the public listed in Table F.4-2.

Table F. 4-2 Dose limits for the public

Items	Limits
Dose limits outside the peripheral monitoring area	
Effective dose	1mSv/year
Equivalent dose for eye lens	15mSv/year
Equivalent dose for skin	50mSv/year

(2) Numerical Guide to Reduce Dose to the Public in Vicinity and Discharge Control

At major nuclear facilities licensed on the basis of the Reactor Regulation Law, an operator, in addition to comply with dose limits and concentration limits of radioactive materials outside peripheral monitoring area, establishes an annual numerical discharge control guide, which corresponds to a dose well below the dose limit of 1mSv/year, and makes efforts to keep the numerical discharge control guide. The regulatory body acknowledges the numerical discharge control guide and receives report on it from the operator

At radioisotope waste management facilities licensed on the basis of the Radiation Hazards Prevention Law, an operator, in addition to comply with concentration limits of gaseous and liquid discharge, makes efforts to keep dose at site boundary below 250μSv/3 months

(3) Measurement of Environmental Radiation

An operator of major nuclear facility licensed on the basis of the Reactor Regulation Law conducts radiation monitoring at the site vicinity during normal operation, assesses the impact upon the environment of the discharge of radioactive materials from the facility, and feedbacks the results in improving discharge control and facility management.

Local governments hosting nuclear facilities also monitor radiation level independently at the site vicinity to protect public health and safety.

Meanwhile, the NSC indicates fundamentals of the monitoring plan and its implementation and the evaluation of radiation dose in the Guide on Environmental Radiation Monitoring, in order to improve and standardize monitoring technology. Local governments and operators implement monitoring in accordance with the guide.

An operator of radioisotope waste management facility licensed on the basis of the Radiation Hazards Prevention Law monitors radiation level and measures contamination by radioactive materials at controlled area boundary, site boundary and any appropriate points.

F.4.3 Regulatory Control Activities

(1) Discharge Control of Radioactive Materials

The abovementioned rules provide for concentration limits of radioactive materials in both gaseous and liquid discharge from nuclear facilities monitored outside peripheral monitoring area, and dose limit due to radioactive materials in liquid discharge from reprocessing facilities monitored at the outlet to the ocean. The rules also provide that operators shall immediately report to the regulatory body when any of these limits are exceeded, and report within 10 days on details of the event and corrective measures taken.

(2) Control of Personal Exposure

The abovementioned rules require operators to keep records of doses to personnel engaged in radiation work.

F.4.4 Unplanned or Uncontrolled Releases

Operators of Nuclear Facilities, on the basis of abovementioned rules, shall prepare the Safety Preservation Rules and have them approved by the regulatory body, which provide that operators, in case of emergency including unplanned or uncontrolled release of radioactive materials, should take measures against the spread of contamination by nuclear fuel materials or radioisotopes and carryout decontamination work, and rescue persons who suffer or may suffer from radiation damage. The Safety Examination Guide for Reprocessing Facility, which is used in safety examination of reprocessing facility with large inventory of radioactive materials, provides that fire and explosion due to fine metal particles from fuel cladding or organic solvent, criticality accident, leakage or loss of function due to damage or failure of equipment or piping, or spent fuel handling failure do not cause excessive exposure of radiation to the public.

When an unplanned or an uncontrolled release of radioactive materials initiates any specific events (Table F.5-1) defined in the Special Law for Nuclear Emergency, emergency activities start according to the procedure, and the Prime Minister declares Nuclear Emergency if the initial event progresses and exceeds the predetermined level.

Nuclear emergency will be described in detail in the ensuing section.

F.5 Emergency Preparedness (Article 25)

1. Each Contracting Party shall ensure that before and during operation of a spent fuel or radioactive waste management facility there are appropriate on-site and, if necessary, off-site emergency plans. Such emergency plans should be tested with appropriate frequency.

2. Each Contracting Party shall take the appropriate steps for the preparation and testing of emergency plans for its territory insofar as it is likely to be affected in the event of a radiological emergency at a spent fuel or radioactive waste management facility in the vicinity of its territory.

F.5.1 Laws, Regulations and Requirements for Nuclear Emergency Preparedness

The Special Law of Emergency Preparedness for Nuclear Emergency (hereinafter referred to as the Special Law of Nuclear Emergency) came into force in June 2000 in order to take special measures addressing special characteristics of nuclear emergency. Also, the NSC revised in May 2000 the "Emergency Preparedness Guidelines" on technical and special matters of a nuclear emergency measures. The Special Law of Nuclear Emergency was enacted within the legal framework already established by the Basic Law on Emergency Preparedness, which had defined roles of the national government, local governments, etc. in emergencies such as earthquakes, typhoons, conflagrations and nuclear emergency. The Special Law of Nuclear Emergency defines a nuclear emergency as a situation where, as a result of the operation of a nuclear facility, unusually high level of radioactive materials or radiation is released or streams outside the nuclear facilities, and a nuclear disaster as a situation where a nuclear emergency damages the life, body or property of the public. The part of “Nuclear Emergency Preparedness” in the Basic Plan for Emergency Preparedness based on the Basic Law on Emergency Preparedness, was extensively revised in accordance with the Special Law of Nuclear Emergency, clarifying roles and responsibilities of the national government, local governments, and nuclear business operators. In this Article, nuclear business operators include operators of enrichment and/or fuel manufacturing business, nuclear reactor facilities, spent fuel storage business, reprocessing business and radioactive waste disposal business.

At radioisotope waste management facilities licensed under the Radiation Hazards Prevention Law, a nuclear emergency defined by the Special Law of Nuclear Emergency is not postulated to occur. However, the law and relevant regulations provide measures of communication, evacuation, decontamination, etc. to be taken by an operator in case of earthquake, fire, etc.

This section describes preparedness for emergencies defined by the Special Law of Nuclear Emergency.

(1) An Outline of Emergency Preparedness concerning Major Nuclear Facilities

The summary of emergency preparedness on the basis of the Special Law of Nuclear Emergency is given by Fig. F.5-1. Details are given below.

1) Initial Responses in Nuclear Emergency

Quick response and coordinated cooperation among related organizations are important in a nuclear emergency.

- The Special Law of Nuclear Emergency defines specific initial events in a major nuclear facilities (see Table F.5-1), the occurrence of which the operator shall immediately notify the competent minister and the heads of related local governments of.

- The competent minister, receiving the notification, starts activities according to the procedure stipulated by the law. Staff with expertise in emergency measures will be sent to local governments on request. The Senior Specialist for Nuclear Emergency collects information and coordinates activities preventing expansion of the events.
- When the competent minister recognizes that the specific initial event exceeds the predetermined level and has developed into an emergency, the minister immediately reports it to the Prime Minister.
- The Prime Minister declares “Nuclear Emergency”, and advises or directs related local governments on necessary measures such as sheltering or evacuation to be taken by them.
- The Prime Minister establishes the "Nuclear Emergency Response Headquarters" in Tokyo, which he will head, and the "Local Nuclear Emergency Response Headquarters" in the district where emergency measures are to be taken.
- Local governments establish their own emergency response headquarters following declaration of “Nuclear Emergency.”
- In order to tighten cooperation among the national government, related local governments etc., the "Joint Council for Nuclear Emergency Response" is established at the Off-Site Center mentioned later.

2) Strengthening of the National Emergency Preparedness

The national government establishes following preparation to prevent occurrence of nuclear emergency and to take measures in emergency.

- The competent minister stations a Senior Specialist for Nuclear Emergency in the vicinity of each nuclear facility, who guides and advise the operator in preparing Operator’s Plan for Emergency Preparedness and, in emergency, takes necessary measures preventing progression of the emergency.
- The competent minister designates a facility in the vicinity of a nuclear facility as Off-Site Center to be used in an emergency. In the case of an emergency, the national government, the local governments and the operator establish at the Off-Site Center the "Joint Council for Nuclear Emergency Response", in order to share information and to coordinate their activities. Off-Site Centers were established on the point shown in Fig. F.5-2 by March 2002 Off-Site Centers have communication equipment with the Prime Minister’s Official Residence, the NSC, the Emergency Response Centers of NISA and MEXT and related local governments, and other necessary equipment.
- The national government establishes arrangements to secure quick and coordinated activities in an emergency.
- The national government conducts comprehensive nuclear emergency exercise once a year.

3) Clarification of the Operator’s Responsibility

- The operator develops its own Operator’s Plan for Nuclear Emergency Preparedness after consulting with related local governments, and submits it to the competent minister.
- The operator establishes on-site organization for nuclear emergency preparedness, and designates a Manager for Nuclear Emergency Preparedness who administers the organization.
- The Manager for Nuclear Emergency Preparedness shall notify specific initial events to the competent authorities.

(2) On-site and Off-site Nuclear Emergency Preparedness of Major Nuclear Facilities

Organizations related to nuclear emergency preparedness keep themselves ready to collect and send information and start quick response against an emergency, and conduct exercises, disseminate knowledge and promote research on emergency preparedness. Outline of roles and responsibilities of related organization are as follows.

1) On-Site Emergency Preparedness of Major Nuclear Facilities

When the operator detects abnormal release of radioactive material or abnormal level of radiation at a nuclear facility, it takes necessary measures to prevent progression of the event into an emergency.

The operator develops Operator's Plan for Nuclear Emergency Preparedness after consulting with related local governments, which provides for prevention of, emergency measures against, and post-emergency restoration of, a nuclear emergency, including on-site and off-site cooperation with other organizations. Especially, quick and accurate notification of occurrence of specific initial events to related organizations is a very important obligation of the operator.

Moreover, the operator is required to take part in comprehensive exercise with related organizations, and keep close contact with them.

2) Off-Site Emergency Preparedness of Major Nuclear Facilities

Roles and responsibilities of the national government and local governments in emergency preparedness are defined in the Special Law of Nuclear Emergency and the Basic Plan for Emergency Preparedness. Each local government develops its own detailed local plan for emergency preparedness. They conduct emergency environmental radiation monitoring, and implement evacuation or sheltering of residents receiving advice or direction from the Prime Minister based on the report of the competent minister.

Emergency activities are roughly divided into five categories.

a. to convey information, directions, etc. to residents
b. to conduct emergency environmental radiation monitoring
c. to advise or direct local residents on sheltering or evacuation.
d. to restrict intake of foods and drinks.
e. to conduct emergency medical treatment

(3) Trainings and Exercises

The purpose of nuclear emergency exercise is 1) to enhance understanding of the nuclear emergency preparedness by responsible personnel of the national government, local governments and the operator, and residents, and 2) to verify whether emergency measures function in predetermined way, and whether information sharing and cooperation among related organizations are adequate. The national government, local governments, designated public organizations and the operator cooperate and participate in exercises, which cover communication, monitoring, making decision on emergency measures to be taken, sheltering or evacuation etc., ranging from large scale national exercise to operator's on-site exercise. Exercises in the past years are shown below.

1) Exercise Planned by the National Government (Table F.5-2 (1))

The first comprehensive exercise after the enactment of the Special Law of Nuclear Emergency was conducted on October 28, 2000, at Unit 2 of Shimane Nuclear Power Station, Kashima Town, Shimane Prefecture. The exercise was participated by 83 organizations and 13,000 persons, as well as the Prime Minister, the then Minister of MITI and other ministers. The exercise included the declaration of "Nuclear Emergency" and the establishment of the Nuclear Emergency Headquarters, in addition to verifying the function of the Joint Council for Nuclear Emergency Response established at the Off-Site Center, and the communication with local residents. The subsequent comprehensive exercise was conducted at Unit 1 of Tomari Nuclear Power Station, Hokkaido, on October 27, 2001 and Unit 3 of Ohi Power Station, Fukui

Prefecture, on November 7, 2002.

2) Exercises Planned by Local Governments (Table F.5-2 (2))

The local plan for emergency preparedness prescribes local exercise to be planned and conducted by local governments, which national government supports by sending expert staff.

3) Exercise Planned by the Operator

The operators have conducted on-site exercises including establishment of emergency response headquarters, communication, monitoring, evacuation or sheltering, etc. based on Operator's Plan for Emergency Preparedness for each site.

4) Participation in International Nuclear Emergency Exercise

Japan participated in the Joint International Nuclear Emergency Exercise (JINEX1) held in May 2001 sponsored by the IAEA, learning lessons on cross border radiological emergency, and will participate in future international exercises.

F.5.2 Emergency in the Vicinity of the Territory

Japan is a contracting party to the Convention on Early Notification of a Nuclear Accident, and to the Conventions on Assistance in the Case of a Nuclear Accident or Radiological Emergency. The Ministry of Foreign Affairs has been designated as the authority for notification and the competent ministry for radiological emergency in the vicinity of the territory.

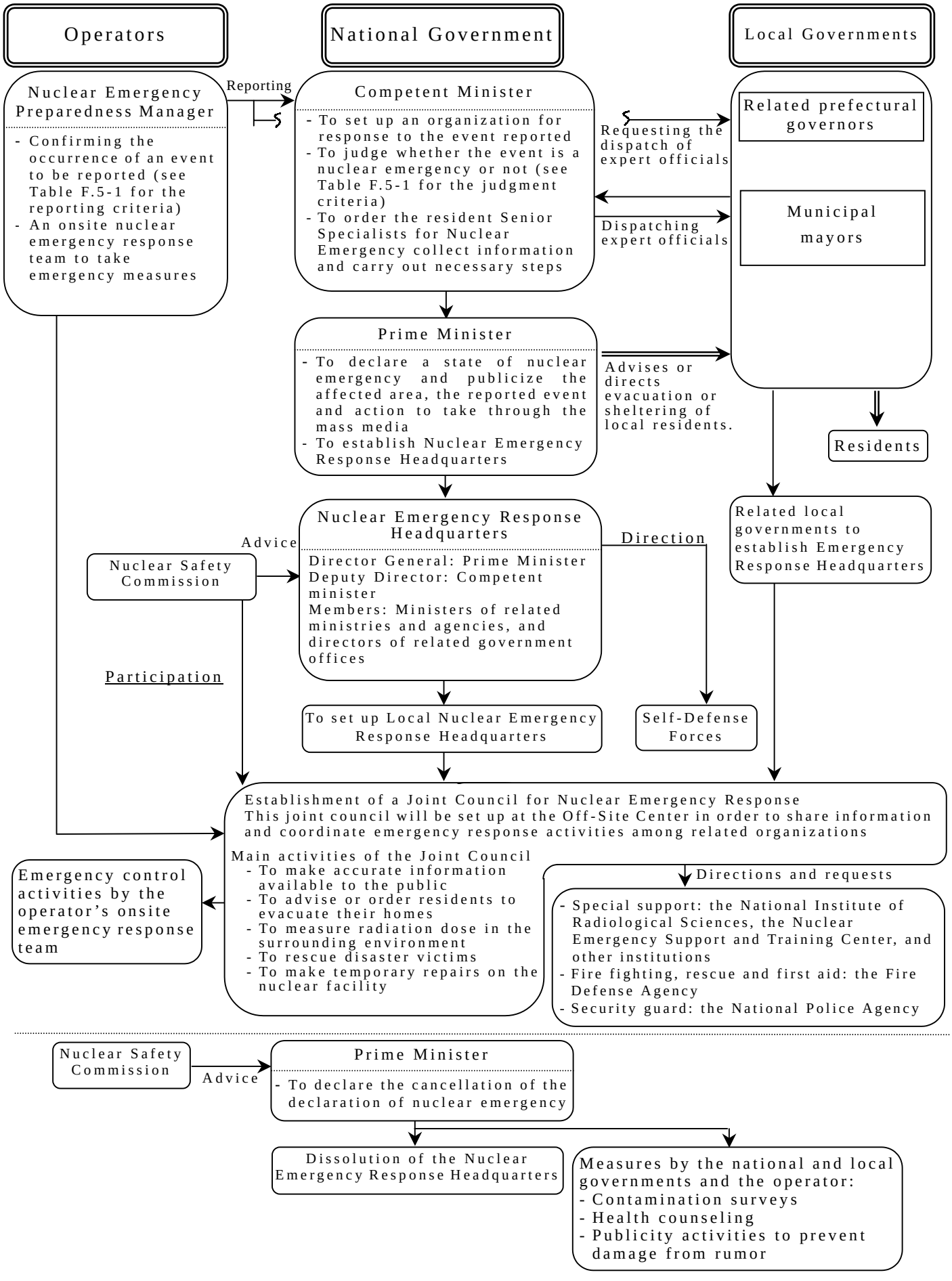

Fig. F.5-1 Measures Based on the Special Law for Nuclear Emergencies

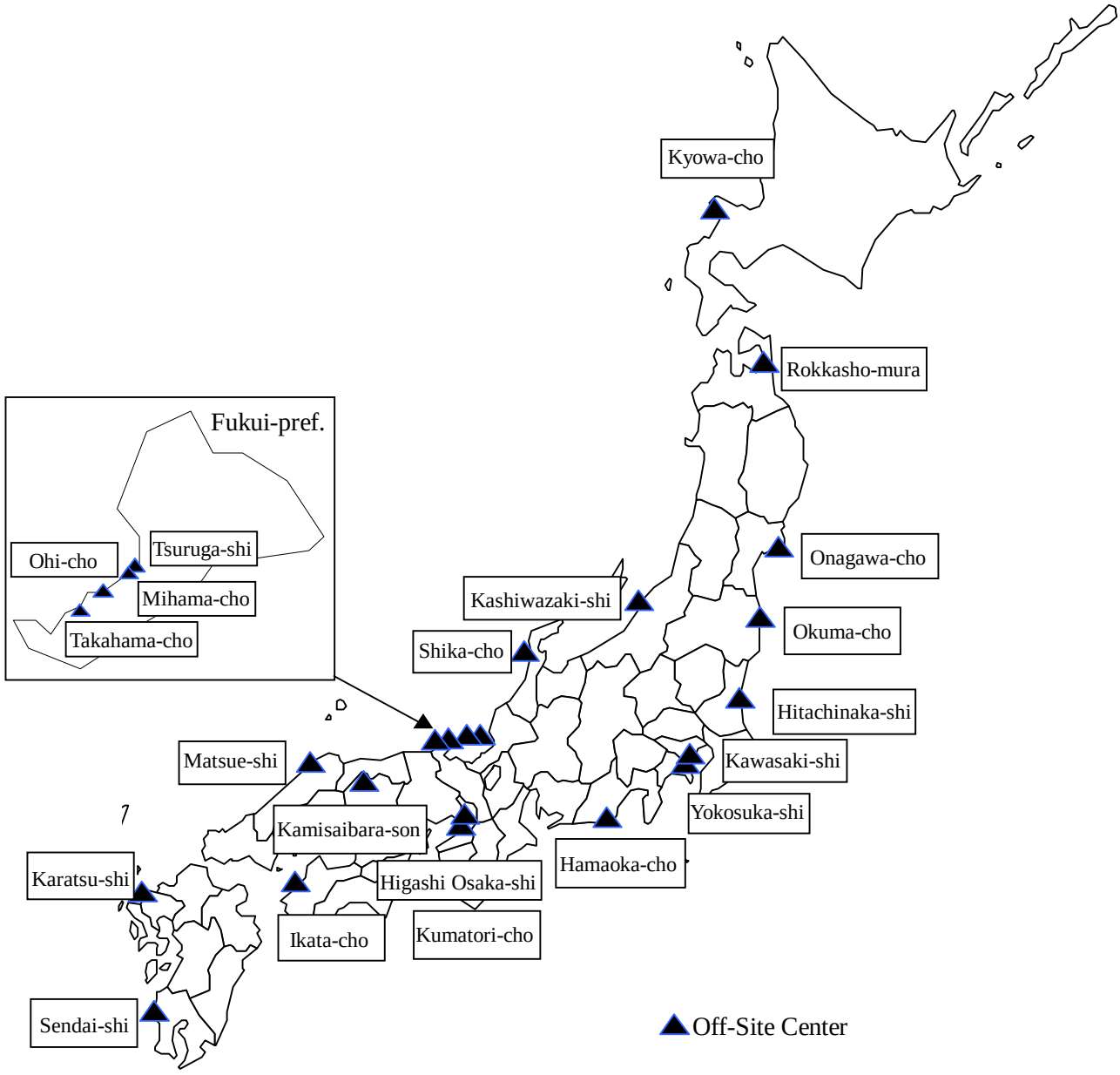

Fig. F5-2 Off-Site Center Site

Table F.5-1 Main Specific Events, Nuclear Emergencies and Countermeasures Prescribed by the Special Law for Nuclear Emergencies

	Events	Reporting Criteria for Nuclear Business Operators and the Criteria for the National Government's Declaration of Emergency	Conditions whereby to judge the occurrence of an emergency
Events to be reported by nuclear business operators	a) Detection of radiation near the site boundary	Exceeding 5μSv/h at one point for more than 10 minutes Exceeding 5μSv/h at more than two points at the same time	Exceeding 500μSv/h at one point for more than 10 minutes Exceeding 500μSv/h at more than two points at the same time
	b) Detection of radioactive material at the usual release points, such as exhaust pipes	The concentration of radioactive material remains at a level equivalent to exceeding 5μSv/h for more than 10 minutes, or radioactive material release at a level equivalent to exceeding 5μSv/h has taken place.	The concentration of radioactive material remains at a level equivalent to exceeding 500μSv/h for more than 10 minutes, or radioactive material release at a level equivalent to exceeding 5mSv/h has taken place.
	c) Detection of radiation or radioactive material (at places other than the controlled area) due to a fire or an explosion	Radiation dose exceeding 50μSv/h Release of radioactive material equivalent to exceeding 5μSv/h	Radiation dose exceeding 5mSv/h Release of radioactive material equivalent to exceeding 500μSv/h
	d) Separate events depending on the characteristics of nuclear facilities Examples: - Failure of scram	A nuclear reactor shut down can not be achieved by usual neutron absorbers.	All reactor shutdown functions have been lost.
	- Loss of reactor coolant	Reactor coolant leakage that requires the activation of the emergency core cooling system (ECCS) has occurred.	All the ECCSs are unable to flood the reactor for cooling.
	- Loss of all AC power supplies	All AC power supplies have been stopped for more than five minutes.	All AC power sources have been lost and all core cooling functions have been lost.
	- A decline in the spent fuel pool water level at a reprocessing facility	The spent fuel pool water level has dropped to a level at which fuel assemblies are exposed.	
The national government's response		The competent minister sends staff with expertise to local governments at their request. Resident senior specialists for nuclear emergencies carry out necessary response operations.	- The competent minister confirms the occurrence of a nuclear emergency and reports it to the Prime Minister. - The Prime Minister declares a state of nuclear emergency and takes the following action:
		Although these activities are not required by the Special Law for Nuclear Emergencies, related ministries and agencies will carry out the following activities in accordance with agreements: - Officials from related ministries and agencies will gather together to have a liaison conference for emergency response among related ministries and agencies in Tokyo. - Interested parties will gather together at the Off-Site Center to hold a liaison conference for field disaster control.	- To advise or direct the heads of related local governments to order residents to evacuate their homes or take shelter indoors; - To establish Nuclear Emergency Response Headquarters in Tokyo and Local Nuclear Emergency Response Headquarter at the appropriate Off-Site Center; and - To set up the Joint Council for Nuclear Emergency Response in order to exchange information between the national and local governments.

Table F.5-2 Nuclear Emergency Exercise

Conductor	Date	Nuclear Power Station
(1) Exercise conducted by National Government		
National Government	2000/10/28(Sat.)	The Chugoku Electric Power Co., Inc. Shimane Nuclear Power Station
National Government	2001/10/27(Sat.)	Hokkaido Electric Power Co., Inc. Tomari Power Station
National Government	2002/11/07(Thurs.)	The Kansai Electric Power Co., Inc. Ohi Power Station
(2) Exercise conducted by Local Government (From April 2001 To July 1, 2003)		
Miyagi-pref.	2001/07/11(Wed.)	Tohoku Electric Power Co., Inc. Onagawa Nuclear Power Station
Ibaraki-pref.	2001/09/29(Sat.)	Japan Nuclear Cycle Development Institute Tokai Reprocessing)
Kanagawa-pref	2001/10/25(Thurs.)	Global Nuclear Fuel-Japan Co., ltd.
Okayama-pref.	2001/10/29(Mon.)	Japan Nuclear Cycle Development Institute Ningyo-Toge Environmental Engineering
Ehime-pref.	2001/11/01(Thurs.)	Shikoku Electric Power Co., Inc. Ikata Power Station
Shimane-pref.	2001/11/07(Wed.)	The Chugoku Electric Power Co., Inc. Shimane Nuclear Power Station
Niigata-pref.	2001/11/20(Tues.)	The Tokyo Electric Power Co., Inc. Kashiwazaki Kariwa Nuclear Power Station
Saga-pref.	2001/11/26(Mon.)	Kyushu Electric Power Co., Inc. Genkai Nuclear Power Station
Fukushima-pref.	2001/11/28(Wed.)	The Tokyo Electric Power Co., Inc. Fukushima Daini Nuclear Power Station
Ishikawa-pref.	2002/01/11(Fri.)	Hokuriku Electric Power Co., Inc. Shika Nuclear Power Station
Kagoshima-pref.	2002/01/31(Thurs.)	Kyushu Electric Power Co., Inc. Sendai Nuclear Power Station
Shizuoka-pref.	2002/02/21(Thurs.)	The Chubu Electric Power Co., Inc. Hamaoka Nuclear Power Station
Fukui-pref.	2002/03/30(Sat.)	The Kansai Electric Power Co., Inc. Mihama Power Station
Miyagi-pref.	2002/09/03(Tues.)	Tohoku Electric Power Co., Inc. Onagawa Nuclear Power Station
Ibaraki-pref.	2002/09/30(Mon.)	Japan Nuclear Cycle Development Institute Oarai Engineering Center
Hokkaido	2002/10/25(Fri.)	Hokkaido Electric Power Co., Inc. Tomari Power Station
Ehime-pref.	2002/10/25(Fri.)	Shikoku Electric Power Co., Inc. Ikata Power Station
Kagoshima-pref.	2002/10/29(Tues.)	Kyushu Electric Power Co., Inc. Sendai Nuclear Power Station
Fukushima-pref.	2002/11/08(Thurs.)	The Tokyo Electric Power Co., Inc. Fukushima Daiichi Nuclear Power Station
Shimane-pref.	2002/11/08(Fri.)	The Chugoku Electric Power Co., Inc. Shimane Nuclear Power Station
Niigata-pref.	2002/11/09(Sat.)	The Tokyo Electric Power Co., Inc. Kashiwazaki Kariwa Nuclear Power Station
Ishikawa-pref.	2002/11/11(Mon.)	Hokuriku Electric Power Co., Inc. Shika Nuclear Power Station
Saga-pref.	2002/11/25(Mon.)	Kyushu Electric Power Co., Inc. Genkai Nuclear Power Station
Okayama-pref.	2002/11/26(Tues.)	Japan Nuclear Cycle Development Institute Ningyo-Toge Environmental Engineering
Aomori-pref	2002/12/18(Wed.)	Japan Nuclear Fuel Ltd. Reprocessing Plant
Nagasaki-pref	2003/01/30(Thurs.)	Kyushu Electric Power Co., Inc. Genkai Nuclear Power Station
Shizuoka-pref.	2003/02/03(Mon.) /04(Tues.)	The Chubu Electric Power Co., Inc. Hamaoka Nuclear Power Station

F.6 Decommissioning (Article 26)

Each Contracting Party shall take the appropriate steps to ensure the safety of decommissioning of a nuclear facility. Such steps shall ensure that:

(i) qualified staff and adequate financial resources are available;

(ii) the provisions of Article 24 with respect to operational radiation protection, discharges and unplanned and uncontrolled releases are applied;

(iii) the provisions of Article 25 with respect to emergency preparedness are applied; and

(iv) records of information important to decommissioning are kept.

The AEC's Long-term Program states that nuclear facilities licensed on the basis of the Reactor Regulation Law should be decommissioned safely at the responsibility of their operators, while obtaining local community's understanding and support, and that the land, after decommissioning of commercial power reactors, is expected to serve as sites for new nuclear power plants, again with the understanding of their communities.

The Nuclear and Industrial Safety Committee Decommissioning Safety Subcommittee at the Advisory Board for Natural Resources and Energy published a report "A Concept for Assuring and Regulating the Safety of Decommissioning Commercial Power Reactor Facilities", August 2, 2001. The regulatory body applies existing regulations of the Notification of Dismantling and the Change of the Safety Preservation Rules on the basis of the Reactor Regulation Law together with the report to ensure that operators implement safety measures in dismantling commercial power reactor facilities.

In these regulations operators are required to notify the regulatory body of method and process of dismantling and method of management of nuclear fuel materials and objects contaminated by them, and to submit to the regulatory body for approval the Safety Preservation Rules which include method of and organization for facility maintenance, radiation control, waste management, etc.

In order to make long-term regulation on decommissioning more effective, the regulatory body allows operators to submit, at first, summary of long-term decommissioning plan and details of initial short-term work process, leaving details of later work processes to later submissions as decommissioning work progresses. Also, the regulatory body requests operators to apply for the Change of the Safety Preservation Rules as decommissioning work progresses.

Also, operators of other nuclear facilities such as research reactor facilities, enrichment and/or fuel manufacturing facilities, spent fuel storage facilities and reprocessing facilities are required to submit the Notification of Dismantling in accordance with the Reactor Regulation Law and relevant regulations. Operators of fuel material use facility, when terminating their businesses, are required to make decontamination and take other measures within 30 days of the closure.

F.6.1 Human and Financial Resources

(1) Human Resources

Operators clarify, in the Safety Preservation Rules, organizations responsible for ensuring safety in decommissioning processes, and planning and implementation of relevant safety education programs

for management and workers including subcontractors. The regulatory body conducts the Nuclear Safety Inspection four times a year to supervise operators' compliance with the rules.

(2) Financial Resources

Electric utilities have deposited funds for decommissioning of commercial power reactor facilities using the Dismantling Reserve Funds.

NISA requires electric utilities to clarify financial resources in the Notification of Dismantling, and confirms it.

F.6.2 Radiation Protection at the Decommissioning Stage

The regulations on radiation protection applied to nuclear facilities in operation, which is described at Article 24 (Section F.4), are also applicable to nuclear facilities in the process of being decommissioned.

F.6.3 Emergency Preparedness

The regulations on emergency preparedness applied to nuclear facilities in operation, which is described at Article 25 (Section F.5), are also applicable to nuclear facilities in the process of being decommissioned.

F.6.4 Keeping Records of Information Important to Decommissioning

The Reactor Regulation Law requests operators to keep important records such as inspection records, radiation control records, etc. at decommissioning stage in the same way as at operating stage, and other records specific to decommissioning such as each equipment or system being dismantled, time period and method for dismantling it, etc. at the end of each dismantling process, thus allowing the regulatory body to confirm that decommissioning has been completed ensuring safety and in compliance with the approved Notification of Dismantling of that facility.

G. Safety of Spent Fuel management

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Section G. Safety of Spent Fuel Management

The safety of spent fuel management is ensured in accordance with the regulatory framework for the safety of spent fuel management set forth in Section E.2.3. In other words, the safety management of spent fuel on a reactor facility site or a reprocessing plant site is regulated by the provisions of the Reactor Regulation Law concerning the establishment and operation of nuclear reactors or a reprocessing facilities. More specifically, spent fuel management facilities are regulated as associated facilities operated in the respective reactors or facilities. On the other hand, the safety management of spent fuel stored outside a reactor or a reprocessing plant site is regulated in accordance with the provisions for storage business in the Reactor Regulation Law, as specialized facilities concerning licensing, permission, approval and inspections. At present, there is no storage facility which is in operation, under construction or for which an application for permission of construction has been filed.

Fig. G.1 outlines a flow of regulations concerning spent fuel storage facilities in relation to the terms used in the joint convention. A flow of regulations begins with an application for a business license. The regulatory body grants a business operator license to conduct a business after safety examination. Prior to construction of an installation, the regulatory body examines a design and a construction plan and approves them if they are deemed acceptable. When the construction of a facility requires prescribed welding operations, the regulatory body checks the validity of welding through welding inspections or welding safety management inspections. Moreover, the regulatory body conducts pre-service inspections to make sure that the construction works are being carried out in accordance with the approved design and construction plan. The regulatory body requires a business operator to specify safety precautions in Safety Preservation Rules and approves the Safety Preservation Rules. And when an operator has notified the regulatory body of the commencement of business operations (excluding reactor facilities), they are allowed to put nuclear facilities into active service.

After the facility went into service, the regulatory body conducts periodical inspections and checks safety at the facility in order to ascertain the integrity of the facility and the operator’s compliance with the Safety Preservation Rules.

As for decommissioning, the operator files notification of dismantling with the regulatory body and enters into decommissioning of a nuclear facility. After the nuclear facility was dismantled and removed, the operator files notification of closure with the regulatory body and the decommissioning comes to an end.

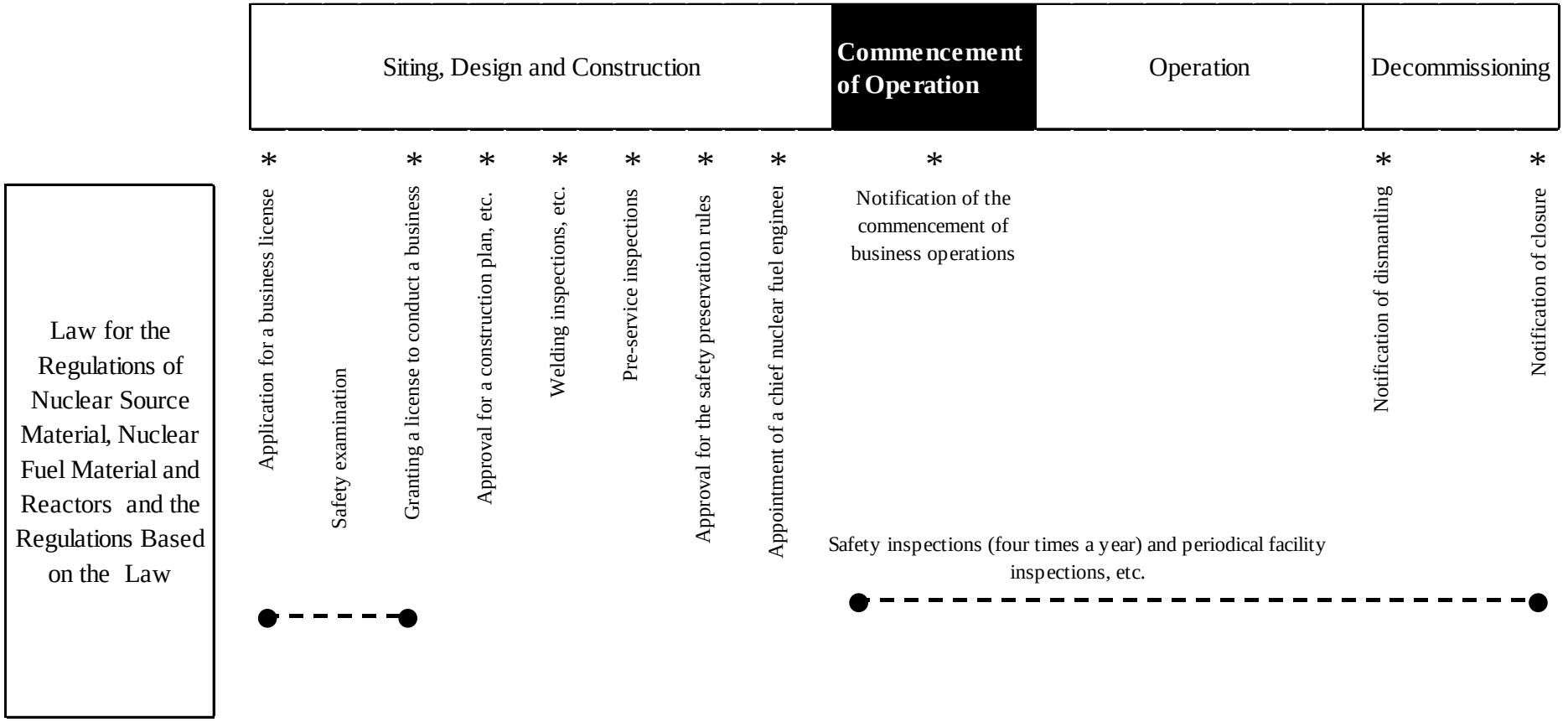

Fig. G.1 A Flow of Regulations Concerning Spent Fuel Storage Facilities

G.1 General Safety Requirements (Article 4)

Each Contracting Party shall take the appropriate steps to ensure that at all stages of spent fuel management, individuals, society and the environment are adequately protected against radiological hazards.

In so doing, each Contracting Party shall take the appropriate steps to:

(i) ensure that criticality and removal of residual heat generated during spent fuel management are adequately addressed;

(ii) ensure that the generation of radioactive waste associated with spent fuel management is kept to the minimum practicable, consistent with the type of fuel cycle policy adopted;

(iii) take into account interdependencies among the different steps in spent fuel management;

(iv) provide for effective protection of individuals, society and the environment, by applying at the national level suitable protective methods as approved by the regulatory body, in the framework of its national legislation which has due regard to internationally endorsed criteria and standards;

(v) take into account the biological, chemical and other hazards that may be associated with spent fuel management;

(vi) strive to avoid actions that impose reasonably predictable impacts on future generations greater than those permitted for the current generation;

(vii) aim to avoid imposing undue burdens on future generations.

G.1.1 Criticality and Removal of Residual Heat

In accordance with the Reactor Regulation Law, the regulations concerning the storage of spent fuel require operators of facilities to take steps necessary for the cooling of spent fuel and take the appropriate steps to prevent spent fuel from attaining criticality in any circumstances at spent fuel management facilities that use either the water pool storage method or the metal dry cask storage method.

Furthermore, the guidelines enacted by the NSC require the operators of spent fuel storage and handling facilities to take the appropriate steps to prevent spent fuel from reaching criticality. Table G.1-1 shows specific safety requirements that must be met at commercial power reactors.

Operators of the facilities are required by regulations and guidelines based on the Reactor Regulation Law, to install cooling equipment capable of cooling pool water and adequately removing decay heat generated by spent fuel stored at facilities using the water pool storage method. In the case of using the metal dry cast storage method, operators of the facilities are obligated to install a facility of such construction as being capable of cooling metal dry casks through natural air-cooling and adequately removing decay heat generated by spent fuel stored. In addition, this facility must be constructed so that stored spent fuel casks are well spaced out and, even if spent fuel is stored at full capacity, spent fuel remains sub-critical.

G.1.2 Minimization of the Generation of Radioactive Waste in Spent Fuel Management

Minimization of radioactive waste generation is described in Section H.1.2.

G.1.3 Interdependencies Among Different Steps in Spent Fuel Management

As mentioned in Section E.1.6, operators performing facility operations at each step of spent fuel generation, storage and reprocessing are required to obtain licenses for business operation corresponding to each step in accordance with the Reactor Regulation Law. The details of regulations for reactor, spent fuel storage and reprocessing facility operation are prescribed by the regulations and standards under the Reactor Regulation Law.

The operators are responsible for storing spent fuel, which has been removed from a nuclear reactor after being used for a given period, in a spent fuel storage pool at a reactor facility for a proper period of time in order to allow radioactivity to decay and to attenuate residual heat, and then shipping it to a reprocessing facility. During spent fuel storage, operators are required to maintain, manage and monitor a storage conditions by installing pool water clean-up equipment at a storage facility if the water pool storage method is used, or providing inert gas-filled storage containers at a storage facility if the dry storage method is used. Moreover, when spent fuel is carried out, operators are required to check to make sure that spent fuel to be carried out meets the specifications for acceptance at reprocessing facilities.

G.1.4 Regulations for Radiation Protection

Radiation protection concerning the safety of spent fuel management is described in Section F.4.

G.1.5 Taking into Account Biological, Chemical and Other Hazards

The regulatory body, when issuing a license to a major nuclear facility in accordance with the Reactor Regulation Law, conducts safety examination to ensure that the location, structure and equipment of the facility are adequate to prevent hazards due to nuclear fuel material or materials contaminated with it.

G.1.6 Taking into Account Impacts on Future Generations

As mentioned in Section B, the Government of Japan makes it a basis of its nuclear energy policy to domestically establish a nuclear fuel cycle in which spent fuel is reprocessed in order to make effective use of uranium resources. Spent fuel generated by nuclear power plant is considered as a useful recyclable fuel resource, so that it will be stored and managed safely until it is reprocessed.

G.1.7 Taking into Account Burdens on Future Generations

The competent minister is required by the law to examine an application for a license for a major nuclear facility to ensure that issuing the license does not pose any impediment to the development and planned utilization of nuclear energy and that an applicant has a financial basis necessary for adequate business operations.

In accordance with the ministerial ordinance concerning reserves for reprocessing of spent nuclear fuel under the Electric Utilities Industry Law, electric utilities are required to set up reserves for reprocessing of spent fuel every business year to meet expenses entailed in reprocessing of spent nuclear fuel.

Table G.1-1 Requirements for the Design of Spent Fuel Management Facilities under Examination Guide for Safety Design of Light Water Nuclear Power Reactor Facilities

Items	Requirements
Spent fuel storage and handling system	- Appropriate periodical testing and inspection of structures, systems and components with safety functions shall be possible - Storage system shall have appropriate containment and air purification system. - Storage system shall have appropriate storage capacity. - Handling system shall have capability to prevent the dropping of fuel assemblies during transfer. - Proper shielding for radiation protection shall be available. - Storage system shall have the system capable of fully removing decay heat and transporting it to an ultimate heat sink with associated purification system. - Prevention of excessive decrease of cooling water inventory in the storage systems and proper leakage detection shall be possible. - Storage systems shall not lose their safety functions even in case of postulated dropping of fuel assemblies during handling.
Prevention of fuel criticality	Fuel storage and handling systems shall be so designed that criticality can be prevented in any postulated case by use of geometrical safety layout or other appropriate means.
Monitoring of a fuel handling place	Fuel handling area shall be so designed that the situation leading to the loss of decay heat removal capability and excessive radiation levels can be detected and that such situation can be properly communicated to the personnel or corrective measures can be automatically taken against such situation.

G.2 Existing Facilities (Article 5)

Each Contracting Party shall take the appropriate steps to review the safety of any spent fuel management facility existing at the time the Convention enters into force for that Contracting Party and to ensure that, if necessary, all reasonably practicable improvements are made to upgrade the safety of such a facility.

G.2.1 Existing Spent Fuel Management Facilities

The regulatory body conducts following inspections on spent fuel management facilities associated to major nuclear facilities. On the basis of inspections conducted to this day, none of spent fuel management facilities were found to require significant corrective actions to continue operation.

(1) Periodical Inspections of Facility

The regulatory body conducts periodical inspections of facility once a year (once every 13 months in the case of commercial power reactor facilities) to confirm if the performance of the facilities and equipment complies with the technical standards prescribed by laws and ordinances.

(2) Nuclear Safety Inspections

The regulatory body conducts nuclear safety inspections by resident Nuclear Safety Inspectors four times a year to check for nuclear business operators' compliance with the Safety Preservation Rules.

G.3 Siting of Proposed Facilities (Article 6)

Each Contracting Party shall take the appropriate steps to ensure that procedures are established and implemented for a proposed spent fuel management facility:

(i) to evaluate all relevant site-related factors likely to affect the safety of such a facility during its operating lifetime;

(ii) to evaluate the likely safety impact of such a facility on individuals, society and the environment;

(iii) to make information on the safety of such a facility available to members of the public;

(iv) to consult Contracting Parties in the vicinity of such a facility, insofar as they are likely to be affected by that facility, and provide them, upon their request, with general data relating to the facility to enable them to evaluate the likely safety impact of the facility upon their territory.

In so doing, each Contracting Party shall take the appropriate steps to ensure that such facilities shall not have unacceptable effects on other Contracting Parties by being sited in accordance with the general safety requirements of Article 4.

G.3.1 Evaluation of Site-Related Factors and Impact of Proposed Facilities

The regulatory body, when issuing a license to operate a nuclear facility in accordance with the Reactor Regulation Law, conducts safety examination to ensure that siting and the basic design of facility, equipments and components of a major nuclear facility are adequate to prevent hazards due to nuclear fuel material or materials contaminated with it. The regulatory body also uses examination guide in safety examination.

The Basic Guides for Safety Examination of Nuclear Fuel Facilities, one of the safety examination guides, provide that a site shall satisfy the following conditions:

- Basic conditions: No event liable to induce large accident is likely to occur at and near a proposed site for a nuclear fuel facility and there have also been very few events deemed liable to propagate disaster.
- Condition during normal operations: Radiation dose to which members of the public may be exposed during normal operations of a proposed nuclear fuel facility are kept ALARA.
- Condition at an accident: The maximum postulated accident at the proposed nuclear fuel facility should not cause excessive exposure to the public.

As for the basic conditions, the guides governing each types of facilities provide that operators must take into account the possible impacts from the natural environment such as earthquake, tidal wave, flood, typhoon, snowfall and other natural phenomena, as well as the possible impacts on the social environment of a fire and explosion at nearby factories, a falling object from an aircraft accident, and other similar events.

Details of public exposure during normal operations, and in accidents, of nuclear facilities, are given in Section F.4. and in Section G.5.1., respectively.

Siting of a spent fuel management facility attached to a reactor facility is examined in accordance with the Examination Guide for Nuclear Reactor Siting Evaluation and Application Criteria as part of examinations of a whole reactor facility.

G.3.2 Information Disclosure

Information on the safety of nuclear facilities, including application documents, is made available to members of the public as part of administrative services. Moreover, government documents are made available to the general public upon request made in accordance with the Law on the Disclosure of Information Held by Administrative Agencies, which came into force on April 1, 2001, unless reasons for non-disclosure apply.

Furthermore, application documents submitted by operators for licenses to conduct business operations or construct nuclear facilities are made available for public at the National Diet Library and other institutions.

G.3.3 Relationship with Neighboring Countries

Being an insular country, Japan is located at a considerable distance from its neighboring countries. Therefore, as long as the safety of nuclear facilities is properly secured within Japan, nuclear facilities in the country are highly unlikely to have safety impacts on the neighboring countries. The Japanese government does not have it a rule to consult the neighboring countries about siting of nuclear facilities. The Japanese government provides neighboring countries with information on nuclear energy in the country through bilateral consultation, etc.

G.4 Design and Construction of Facilities (Article 7)

Each Contracting Party shall take the appropriate steps to ensure that:

(i) the design and construction of a spent fuel management facility provide for suitable measures to limit possible radiological impacts on individuals, society and the environment, including those from discharges or uncontrolled releases;

(ii) at the design stage, conceptual plans and, as necessary, technical provisions for the decommissioning of a spent fuel management facility are taken into account;

(iii) the technologies incorporated in the design and construction of a spent fuel management facility are supported by experience, testing or analysis.

G.4.1 Limitation of Radiological Impacts on Individuals, Society and the Environment

The regulations under the Reactor Regulation Law provide that an applicant for a license for a nuclear facility should attach to application documents explaining: (i) meteorological conditions, the ground conditions, hydrological conditions, a social environment, and others at the site; (ii) safety design of the facility; (iii) radiation protection from nuclear fuel material (including spent fuel) and matters contaminated by it, and radioactive waste management; (iv) types, extent and possible consequences of postulated accidents at the facility initiated by operational error, equipment or system failure, earthquake, or a fire.

The regulatory body examines application and attached documents to confirm that appropriate measures are taken in the design to satisfy basic conditions, conditions during normal operations and conditions in an accident as mentioned in Section G.3.1.

The Reactor Regulation Law and its regulations require operators to take appropriate measures in the design to limit radiation hazards on individuals, society and the environment to ensure that:

(1) nuclear facility is capable of confining radioactive material to a limited section;
(2) proper radiation shield is provided to hold public exposure to direct radiation and skyshine rays sufficiently low.
(3) adequate radiation shield is provided for personnel engaged in radiation work considering the working conditions;
(4) appropriate measures are taken to oversee and manage the working environment for personnel engaged in radiation work;
(5) the concentration of radioactive material releases to the environment is kept ALARA by, for example, properly processing radioactive waste produced from storage facility;
(6) appropriate measures are taken to properly monitor the concentration of radioactive material at a radioactive waste release pathway; and
(7) appropriate safety precautions to cope with an accident, such as an emergency alarm system, a communication channel, and measures for evacuation of personnel engaged in radiation work, are taken.

The details about safety evaluation during an accident are described in Section G. 5.1.

The operators are required to prepare construction plan, to obtain the approval by the competent minister, and to go through welding inspections during the construction of a nuclear facility at an each construction process, when related work is completed. The regulatory body confirms that the construction work has been carried out as approved and is consistent with the technical standards. Pre-service inspections include various inspections and tests ranging from the components structure, strength or leakage inspections to the functions and performance tests of a nuclear facility as a whole.

G.4.2 Conceptual Plans and Technical Provisions for Decommissioning

The Reactor Regulation Law provides that operators shall, when dismantling a nuclear facility, submit to the competent minister in advance a notification setting forth a method of dismantling and a method of disposing of nuclear fuel material and materials contaminated with it.

With respect to the development of technologies for dismantling commercial power reactors, actual dismantling of the JPDR and dismantling technologies usable in the decommissioning of commercial power reactors were developed under the long-term program formulated by the AEC. The JPDR was dismantled in accordance with the Decision by NSC named “Basic Concept of Securing the Safety of the Dismantling of Reactor Facilities: Dismantling JPDR.”* The NSC decided that basic concept to ensure the safety of future dismantling of nuclear facilities should be formulated on the basis of experience in the dismantling of the JPDR, the progress of dismantling technology, and international trends.

* : In August 2001, the name of this decision was changed as "Basic Policy of Securing the Safety of the Dismantling of Reactor Facilities", and the content was revised partly.

The Advisory Committee on Decommissioning, an advisory body to the then Ministry of International Trade and Industry, in January 1997, summarized tasks that should be addressed on decommissioning technology, safety measures and procedures, and the processing and disposal of waste. Moreover, based on data obtained from the dismantling of the JPDR, the Nuclear and Industrial Safety Subcommittee’s Decommissioning Safety Subcommittee at the Advisory Committee for Natural Resources and Energy published a report in August 2001. In this report, the subcommittee spelled out concrete steps on planning for ensuring safety of decommissioning, on safety management, on decommissioning activity, on considerations in ensuring safety, and on a safety regulation policy. Nuclear business operators decommission nuclear facilities in accordance with these policies.

G.4.3 Steps to Support the Reliability of Technologies

Operators incorporate sufficiently time-tested domestic and foreign technologies in the design and construction of nuclear facilities.

Since 1976 the NSC has been promoting research on the safety of environmental radioactivity and radioactive waste at major nuclear facilities. Researches have been conducted on the safety of major nuclear facilities with the aim of meeting the possible expansion and diversification of nuclear power development and utilization, as well as contributing to form a national consensus on the safety of major nuclear facilities. Specifically, the JAERI and other institutions are carrying out research projects aimed at developing safety standards, guidelines and acceptance criteria in safety examination, as well as improving safety.

The regulatory body, in a safety examination of nuclear facilities, conducts a cross-check and analysis as necessary to validate the results of safety analyses made by an applicant.

G.5 Assessment of Safety of Facilities (Article 8)

Each Contracting Party shall take the appropriate steps to ensure that:

(i) before construction of a spent fuel management facility, a systematic safety assessment and an environmental assessment appropriate to the hazard presented by the facility and covering its operating lifetime shall be carried out;

(ii) before the operation of a spent fuel management facility, updated and detailed versions of the safety assessment and of the environmental assessment shall be prepared when deemed necessary to complement the assessments referred to in paragraph (i).

G.5.1 Systematic Safety Assessment and Environmental Assessment

The competent minister, when issuing a license for a nuclear facility on the basis of the Reactor Regulation Law, requires the applicant to explain meteorology, geology, hydrology and social environment of the site, and safety design of the facility, and examine them.

The safety examination guides, used to examine an application documents, require the applicant to perform safety assessment on the maximum postulated accidents in each nuclear facilities prescribed in the guides, and confirm that these accidents do not cause excessive public exposure of radiation

The safety examination guides require operators of reactor facilities and reprocessing facilities, which contain quantities of radioactive material, to perform both safety design assessment to confirm the adequacy of safety design of the facility and siting assessment to assess the isolation between the facility and the public from the point of view of radiation safety. Moreover, in a series of safety assessments, the safety assessment guides require that postulated drop of a fuel assembly does not cause excessive public radiation exposure for a water pool type spent fuel management facility, that is attached to a power reactor facility.

G.5.2 Updating of Assessments Before Operation of Facilities

The Reactor Regulation Law provides that nuclear business operators shall apply for alteration of license application of safety examination, when change of license is necessary to incorporate the latest technical knowledge, and that he shall apply for change to the Construction Plan, when major change in detailed design is necessary.

G.6 Operation of Facilities (Article 9)

Each Contracting Party shall take the appropriate steps to ensure that:

(i) the licence to operate a spent fuel management facility is based upon appropriate assessments as specified in Article 8 and is conditional on the completion of a commissioning programme demonstrating that the facility, as constructed, is consistent with design and safety requirements;

(ii) operational limits and conditions derived from tests, operational experience and the assessments, as specified in Article 8, are defined and revised as necessary;

(iii) operation, maintenance, monitoring, inspection and testing of a spent fuel management facility are conducted in accordance with established procedures;

(iv) engineering and technical support in all safety-related fields are available throughout the operating lifetime of a spent fuel management facility;

(v) incidents significant to safety are reported in a timely manner by the holder of the licence to the regulatory body;

(vi) programmes to collect and analyse relevant operating experience are established and that the results are acted upon, where appropriate;

(vii) decommissioning plans for a spent fuel management facility are prepared and updated, as necessary, using information obtained during the operating lifetime of that facility, and are reviewed by the regulatory body.

G.6.1 Verification through Pre-service Inspection

An operator, in accordance with the Reactor Regulation Law or the Electric Utilities Industry Law, prepares Construction Plan and submits it to the regulatory body for approval. Also, the operator undergoes the regulatory body's pre-service inspection at each construction process and at the end of all construction works, to verify that the construction is completed as approved and is consistent with the technical standards. Passing Pre-service inspections, the nuclear business operator is allowed to commence operation of the facility.

G.6.2 Operational Requirements and Conditions

Before the operation of a nuclear facility, an operator subject to the Reactor Regulation Law notifies the regulatory body of an Operational Plan and prepares Safety Preservation Rules specifying methods of operation, inspection and radiation monitoring and submit it to the regulatory body for approval. The Safety Preservation Rules shall specify operational limits, and the facility shall be operated and maintained in compliance with the rules. Table G.6-1 shows the contents of the Safety Preservation Rules of a commercial power reactor facility. The competent minister, finding noncompliance with the operational requirements, orders the operator to take corrective measures.

Operator assigns, a Chief Engineer of Reactor, a Supervisor of Nuclear Fuel Material, or a Supervisor of Spent Fuel, who has passed national examinations, and is put in charge of overseeing safety in the operation of a nuclear facility.

G.6.3 Procedures and Conduct of Maintenance, Operation, Inspection, Etc.

In accordance with the Reactor Regulation Law or the Electric Utilities Industry Law, operators, after commencement of the operation of nuclear facilities, are required to undergo periodical facility inspections and safety inspections of the facilities.

(1) Periodical Inspections of Facilities

The regulatory body conducts Periodical Facility Inspections once a year (once every 13 months in the case of commercial power reactor facilities) to see if the performance of the facilities and equipment complies with the technical standards prescribed by laws and ordinances.

(2) Nuclear Safety Inspections

The regulatory body posts Nuclear Safety Inspector to each nuclear facility to conduct the Nuclear Safety Inspection four times a year to supervise the compliance with the Safety Preservation Rules and release the results to the public the results.

G.6.4 Technical Support throughout the Operation Lifetime

Throughout the operation lifetime of a nuclear facility, the regulatory body obtains engineering and technical advice from a committee, which is composed of experts on operational management, inspection and radiation control, and reflects it in the operation, maintenance and safety regulations as necessary.

METI is promoting demonstration of the reliability of main facilities and equipment, as well as various safety research projects, in order to enhance safety. MEXT is carrying out a safety research project as part of nuclear science research.

Meanwhile, nuclear business operators are collecting information about operating experience both at home and abroad, and accumulating the up-to-date technical information through the self-financed development of technologies and repair work.

Private-sector organizations are providing various forms of support.

G.6.5 Reporting of Incidents and Failures

The Reactor Regulation Law or the Electric Utilities Industry Law require operators to report to the regulatory body about the situation and the measures taken to incidents or failures at major nuclear facilities. The reporting criteria prescribed in these laws for commercial power reactor facilities where most of the spent fuel is stored are shown in Table G.6-2. Furthermore some minor failures below the criteria are also to be reported under a ministerial notification of METI. The regulatory body is further encouraging operators to feedback the measures to prevent a recurrence to other nuclear facilities as well.

G.6.6 Reflecting Operating Experience

Upon receipt of a report on an incident or a failure at a nuclear facility, the regulatory body immediately make it public and, when the cause has been cleared up and the measures to prevent a recurrence have been decided, makes them known to the public. Moreover, the regulatory body assesses each incidents or failures in detail to get the lessons learned with respect to safety, being advised by committee composed of experts on operation management, inspection and radiation control, and reflects them in

the operation, maintenance and safety regulations as necessary.

Furthermore, an agency established by a supporting organization at the behest of the regulatory body is collecting and analyzing information about operating experience both at domestic and overseas nuclear facilities, and providing information to related organizations. A mechanism is established to exchange information about incidents and failures at nuclear facilities with overseas institutions and international organizations, such as the IAEA and the OECD/NEA, as well as under bilateral cooperation agreements.

Meanwhile, electric utilities and the Central Research Institute of Electric Power Industry (CRIEPI), an institution financed by electric utilities, are collecting and analyzing information about operating experience both domestic and abroad. Japanese electric utilities are exchanging information about operating experience with overseas entities through the Institute of Nuclear Power Operations (INPO) and the World Association of Nuclear Operators' (WANO) Tokyo Center. Moreover, each individual electric utility is collecting information under information exchange agreements it has entered into with electric utilities and reactor manufacturers in France, Germany, the United States and other countries. Recognizing the importance of safety information sharing and safety culture throughout the nuclear power industry, related organizations jointly established a private institution NS Net in December 1999. The NS Net is carrying out peer reviews and other routine activities.

G.6.7 Decommissioning Plans and Updating of Information

As described in Section G.4.2, operators intending to dismantle a nuclear facility are obligated to submit to the competent minister in advance a notification setting forth a dismantling method and a method of disposing of nuclear fuel material and articles contaminated by nuclear fuel material.

Table G.6-1 Examples of the Contents of the Safety Preservation Rules for Commercial Power Reactor Facilities

1. The duties of personnel engaged in the operation and management of commercial power reactor, and organization

2. The following items with respect to the safety preservation education for personnel engaged in the operation and management of commercial power reactor

(1) Policy for the safety preservation education

(including preparation of education program)

(2) The contents of the safety preservation education as follows

1) Relevant laws and the Safety Preservation Rules

2) Constitution, performance and operation of commercial power reactor

3) Radiation management

4) Handling of nuclear fuel materials and objects contaminated by them

5) Measures to be taken in emergencies

(3) Other necessary items for the safety preservation education of commercial power reactor

3. Operation of commercial power reactor

4. Safety examination on the operation of commercial power reactor

5. Designation of controlled areas, conservation areas and environment monitoring areas, and restriction of access to these areas

6. Ventilation and discharge monitoring equipment

7. Monitoring of the dose, the dose equivalent, the concentration of radioactive materials and the density of radioactive materials on the surface of objects contaminated by radioactive materials, and the decontamination

8. Management of radiation measuring instruments

9. Patrols and checks of commercial power reactor and their associated measures

10. Voluntary periodical inspections of commercial power reactor

11. Receipt, delivery, transport, storage and other handling of nuclear fuel materials

12. Disposal of radioactive waste

13. Measures to be taken in emergency

14. Records on safety preservation of commercial power reactor (including observance status)

Table G.6-2 Incident and Failure Reporting Standards at Commercial Power Reactor Facilities

Upon the occurrence of any one of the following events, nuclear business operators shall immediately give notice to that effect to the Minister of Economy, Trade and Industry, and shall report to the minister about the situation of the event and corrective actions taken within ten days of the event:

(1) Nuclear fuel material is stolen or its whereabouts is unknown;

(2) A reactor has shut down or the necessity has arisen to shut down a reactor due to a failure in the reactor facility;

(3) A failure of reactor facility is found during its outage, that is likely to affect the operation of a reactor;

(4) The concentration of radioactive material in the air outside a peripheral monitoring area has exceeded the concentration limits due to the gaseous radioactive waste release through ventilation equipment;

(5) Gaseous nuclear fuel material or an article contaminated by nuclear fuel material has leaked outside the controlled area;

(6) The concentration of radioactive material in water on the boundary outside a peripheral monitoring area has exceeded the concentration limits due to the liquid radioactive waste release through discharge facilities;

(7) Liquid nuclear fuel material or an article contaminated by nuclear fuel material has leaked outside the controlled area;

(8) Nuclear fuel material or an article contaminated by nuclear fuel material has leaked inside a controlled area, and remedial measures, such as declaration of off-limits and control of keys, have been newly taken at a place where leakage has occurred, or the leak has spread to outside of the controlled area;

(9) Personnel engaged in radiation work have been exposed to radiation that exceeds or is likely to exceed the dose limits; or

(10) A hazard to personnel (excluding minor hazards other than radiation hazards) has occurred or is likely to occur at a reactor facility.

Source: Rules for the Installation, Operation, Etc. of Commercial Power Reactors

H. Safety of Radioactive Waste Management

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Section H. Safety of Radioactive Waste Management

The safety of radioactive waste management is ensured within the regulatory framework described in Section E.2.4. The safety of management of radioactive waste generated, processed and stored at enrichment and/or fuel manufacturing facilities, reactor facilities, spent fuel storage facilities, reprocessing facilities or fuel material use facilities are regulated by the respective provisions of the Reactor Regulation Law. Moreover, radioactive waste management facilities are regulated as facilities attached to the main facilities. The safety management of radioactive waste that generated at radioisotope use facilities, etc. is regulated by the Radiation Hazards Prevention Law, as described in Section E.2.4.

The safety management of radioactive waste that is to be disposed of, or radioactive waste that is to be processed or stored by independent businesses, is regulated by the provisions of the Reactor Regulation Law on the waste disposal business and other independent waste management business, and facilities are regulated as independent facilities with respect to licensing, permission, approval and inspection.

As mentioned in Section B, HLW and uranium waste produced domestically is stored in storage facilities where it is generated. HLW produced by the overseas reprocessing contract of spent fuel is returned to the Japanese utilities in stable vitrified waste packages, which are stored at JNFL's facilities before disposal. At present, high-level radioactive waste is not yet disposed of, and the regulatory bodies are preparing related regulations. Therefore, this section describes regulations on LLW, the disposal of which has already started.

Fig. H.1 outlines the flow of regulations on LLW disposal. Flow of regulations begins with application for license. The regulatory body issues license after safety examination. At a prescribed construction process, the regulatory body conducts the Safety Verification of Disposal Facility. The operator starts operation after they notify the regulatory body of it. After start of operation, the regulatory body conducts Safety Preservation Inspections four times a year, and conducts Safety Verification of Radioactive Waste Packages at emplacement of each waste package. The regulatory body conducts Safety Verification of Disposal Facility, again, at the closure of the disposal facility.
As the institutional control of the closed disposal facility, operator implements Step-wise Control taking account of types and levels of radioactive waste. Radiation monitoring is carried out at the first and second stages, or at the disposal stage
.

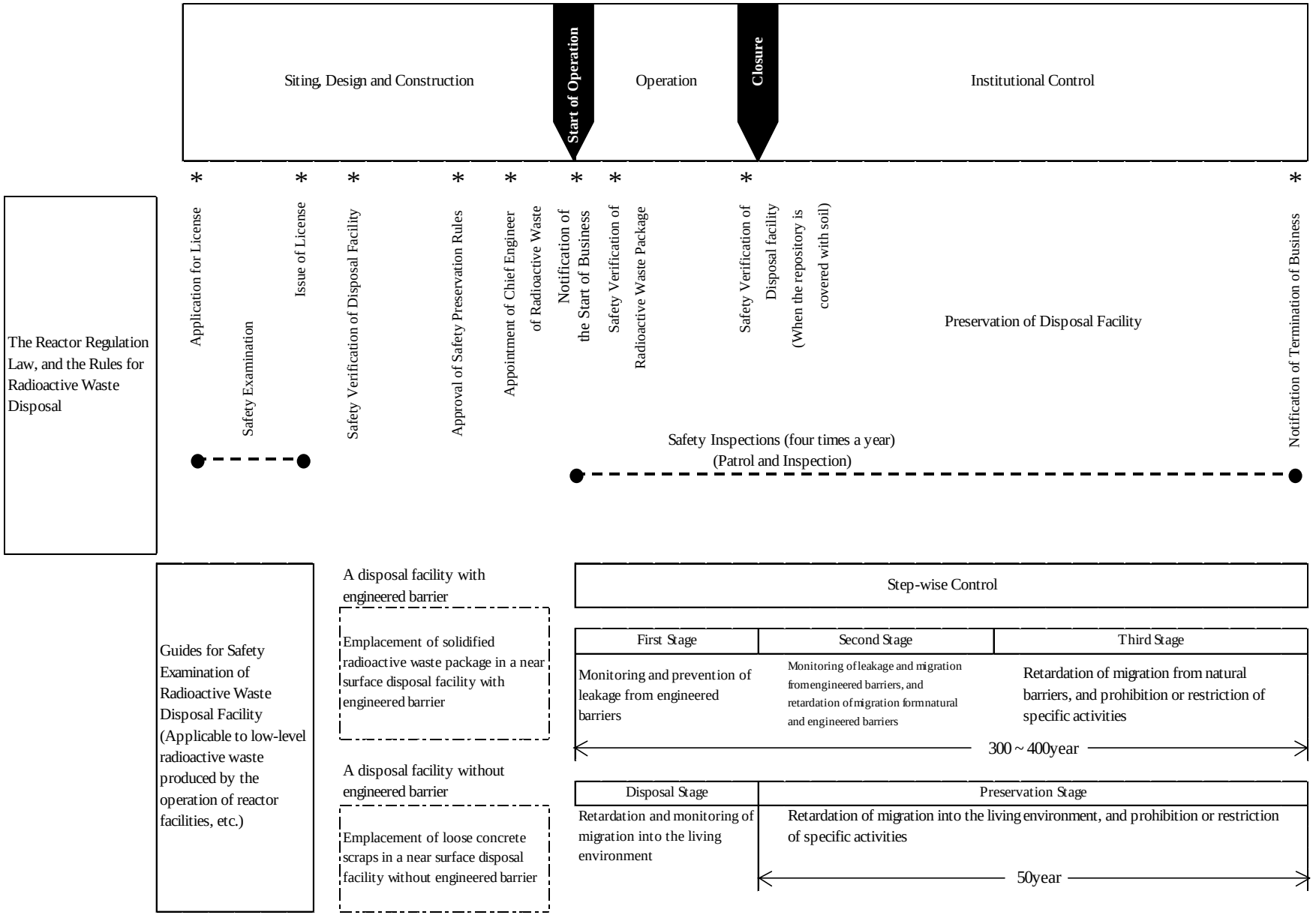

Fig.H-1 A Flow of Regulations on LLW Disposal Facility

H.1 General Safety Requirements (Article 11)

Each Contracting Party shall take the appropriate steps to ensure that at all stages of radioactive waste management individuals, society and the environment are adequately protected against radiological and other hazards. In so doing, each Contracting Party shall take the appropriate steps to:

(i) ensure that criticality and removal of residual heat generated during radioactive waste management are adequately addressed;

(ii) ensure that the generation of radioactive waste is kept to the minimum practicable;

(iii) take into account interdependencies among the different steps in radioactive waste management;

(iv) provide for effective protection of individuals, society and the environment, by applying at the national level suitable protective methods as approved by the regulatory body, in the framework of its national legislation which has due regard to internationally endorsed criteria and standards;

(v) take into account the biological, chemical and other hazards that may be associated with radioactive waste management;

(vi) strive to avoid actions that impose reasonably predictable impacts on future generations greater than those permitted for the current generation;

(vii) aim to avoid imposing undue burdens on future generations.

H.1.1 Criticality and Removal of Residual Heat

The regulatory body, when issuing a license to operate a nuclear facility in accordance with the Reactor Regulation Law, conducts safety examination to ensure that the location, structure and equipment of a nuclear facility are adequate to prevent disasters caused by nuclear fuel material or matters contaminated by it.

In the safety examination of a radioactive waste management facility, the regulatory body confirms that the appropriate measures are taken to prevent criticality and remove residual heat.

Furthermore, the Ordinance for the Reactor Regulation Law specifies upper boundary of radionuclide concentration that should not be exceeded when radioactive waste is emplaced for disposal.

The regulatory body conducts inspections, as described in Section E.1.2(1), to confirm that the conditions on which the license has been issued are satisfied at the design and facility operation.

Facilities licensed under the Radiation Hazards Prevention Law do not necessitate any consideration of criticality or removal of residual heat.

H.1.2 Minimization in the Generation of Radioactive Waste

As mentioned in Section B.3, activities are implemented to minimize the generation of radioactive waste at nuclear facilities.

The Examination Guide for Safety Design of Light Water Nuclear Power Reactor Facilities and the Guidelines for Examination of the Safety of Nuclear Fuel Facilities, request operators to keep public radiation exposure ALARA. Operators of nuclear facilities keep discharge of radioactive gaseous and liquid waste ALARA. Discharge of radionuclides in gaseous waste is reduced by removing radioactive materials through filtration or absorption, and by decay in storage tanks. Discharge of radionuclides in liquid waste are reduced by removing radioactive materials through filtration, ion exchange, or distillation. Solid waste is packed in metal drums, which are stored in dedicated storage pits. Before storing, solid waste is sorted into several categories according to properties of waste, substances that are likely to harm the integrity of waste packages are removed, and the volume of solid waste is reduced through incineration and compaction.

The annual discharge of gaseous and liquid waste, the production of solid waste, the volume reduction, and the inventory of waste are reported to the regulatory body in fiscal year, which reports them to the NSC and disclose them to the public.

Operators of radioisotope waste management facilities licensed under the Radiation Hazards Prevention Law report to the regulatory body amount of annual collection and inventory of liquid and solid waste in the fiscal year.

Furthermore, the development of technologies are carried out to minimize generation of radioactive waste, such as decontamination technology, metal melting technology, and recycling technology of concrete scraps.

The NSC, as mentioned in Section B, has published clearance levels and its verification methods for concrete and metal scraps, which account for a greater portion of waste produced by nuclear facility. The regulatory body is in the process of establishing relevant regulations. Waste below a clearance level needs not be dealt with as radioactive material and can be handled in the same manner as non-radioactive waste. The AEC encourages to recycle this type of waste as far as reasonably achievable.

H.1.3 Interdependencies among the Different Steps in Waste Management

As described in Section E.1.6, operators are required to take appropriate steps to properly manage radioactive waste at processing and storage stages at nuclear facilities (excluding disposal facility), and at disposal stage at disposal facility, in order to appropriately protect individuals, society and the environment against radiation hazards.

Radioactive waste is classified into two categories, HLW (liquid waste generated from spent fuel reprocessing and its vitrified package) and other LLW. The LLW is sub-classified according to origin of waste (difference in composite radioactive nuclides) and level of radioactivity, in order to ensure that these wastes are properly processed, stored and disposed of. Establishment of regulations at the disposal stage (see Table B.4-2) is under way in consistency with the classification of radioactive waste (see Table B.4-1).

H.1.4 Regulations for Radiation Protection

Radiation protection in radioactive waste management is described in Section F.4. One of the criteria specific to waste disposal facility is an application dose criteria at the end of institutional control of a disposal facility. The Guides for Safety Examination of Radioactive Waste Disposal Facility provide that “the

institutional control should be completed within a reasonable time period, after which public exposure should be kept at such a low level as does not need any management for radiation control."

H.1.5 Taking into Account the Biological, Chemical and Other Hazards

The regulatory body, when issuing a license for a major nuclear facility in accordance with the Reactor Regulation Law, conducts safety examination to ensure that the location, structure and equipment of the facility are adequate to prevent hazards due to nuclear fuel material or matters contaminated with it.

The provisions on the Safety Verification of Disposal Facility stipulates that explosive materials, corrosive materials and other hazardous materials shall not be put at disposal facility, and that effective anti-corrosion measures should be taken giving due consideration to the properties of surface water, groundwater and soil.
In addition, the provisions on the Safety Verification of Radioactive Waste Package stipulates that waste package shall not contain the following materials which are likely to harm the integrity of waste package:

(1) explosive material or material that explosively reacts with water;
(2) volatile material;
(3) pyrophoric material;
(4) corrosive material; and
(5) gas emitting material.

Also, the regulatory body, when issuing a license for radioisotope waste management business in accordance with the Radiation Hazards Prevention Law, conducts safety examination to ensure that there should be no radiation hazards caused by radioisotopes or objects contaminated by them.

H.1.6 Taking into Account Impacts on Future Generations

As mentioned in Section B, the policy is stated that the present generation, who enjoy the benefits of nuclear energy, has the obligation to do its utmost for the safe disposal of radioactive waste generated in the research, development and utilization of nuclear energy, and should pay continued efforts to that direction.

In accordance with this policy, radioactive waste produced by nuclear facilities has been, is, will be transported to and disposed of at waste disposal facilities. In issuing license to disposal facility, safety examinations are conducted in accordance with the Guides for Safety Examination of Radioactive Waste Disposal Facility to avoid imposing excessive impacts on future generations.

H.1.7 Taking into Account Burdens on Future Generations

The regulatory body examines an application for a license for a major nuclear facility, to ensure that issuing the license does not pose any impediment to the development and planned utilization of nuclear energy, and that the applicant has capacities necessary for adequate business operation.

Also, as mentioned in Section B, in accordance with the Law on Final Disposal of Designated Radioactive Waste enacted in May 2002, operators of commercial power reactor facility have deposited funds for disposal to the Nuclear Waste Management Organization of Japan (NUMO), an implementing body responsible for disposal, who entrusts the Radioactive Waste Management Funding and Research Center with management of the fund.

H.2 Existing Facilities and Past Practices (Article 12)

Each Contracting Party shall in due course take the appropriate steps to review:

(i) the safety of any radioactive waste management facility existing at the time the Convention enters into force for that Contracting Party and to ensure that, if necessary, all reasonably practicable improvements are made to upgrade the safety of such a facility;

(ii) the results of past practices in order to determine whether any intervention is needed for reasons of radiation protection bearing in mind that the reduction in detriment resulting from the reduction in dose should be sufficient to justify the harm and the costs, including the social costs, of the intervention.

H.2.1 Existing Radioactive Waste Management Facilities

The regulatory body conducts following inspections on radioactive waste management facilities. On the basis of the results of the Periodical Facility Inspections, the Nuclear Safety Inspections or On-the-Spot Inspections conducted to this day, none of major radioactive waste management facilities were found to require significant corrective action to continue operation.

(1) Major Nuclear Facilities licensed under the Reactor Regulation Law

1) Periodical Inspections of Facilities

The regulatory body conducts periodical inspections of major nuclear facilities (excluding disposal facilities) once a year (once every 13 months in the case of commercial power reactor facilities) to confirm if performance of the facilities and equipment complies with the technical standards prescribed by laws and ordinances.

2) Nuclear Safety Inspections

The regulatory body conducts the Nuclear Safety Inspections by resident Nuclear Safety Inspectors four times a year to confirm for operators' compliance with the Safety Preservation Rules.

(2) Radioisotope Waste Management Facilities licensed under the Radiation Hazards Prevention Law

1) Periodical Inspections

The regulatory body conducts the periodical inspections of nuclear facilities once within three years to confirm if the performance of the facilities and equipment complies with the technical standards prescribed by laws and ordinances.

2) On-the-Spot Inspections

The regulatory body dispatches the radiation inspectors to conduct On-the-Spot Inspections if necessary.

H.2.2 Examination of the Results of Past Practices

As results of review of the past practices, there are neither radioactive waste nor nuclear facilities that require any intervention for reasons of radiation protection.

H.3 Siting of Proposed Facilities (Article 13)

Each Contracting Party shall take the appropriate steps to ensure that procedures are established and implemented for a proposed radioactive waste management facility:

(i) to evaluate all relevant site-related factors likely to affect the safety of such a facility during its operating lifetime as well as that of a disposal facility after closure;

(ii) to evaluate the likely safety impact of such a facility on individuals, society and the environment, taking into account possible evolution of the site conditions of disposal facilities after closure;

(iii) to make information on the safety of such a facility available to general public;

(iv) to consult Contracting Parties in the vicinity of such a facility, insofar as they are likely to be affected by that facility, and provide them, upon their request, with general data relating to the facility to enable them to evaluate the likely safety impact of the facility upon their territory.

In so doing, each Contracting Party shall take the appropriate steps to ensure that such facilities shall not have unacceptable effects on other Contracting Parties by being sited in accordance with the general safety requirements of ARTICLE 11.

H.3.1 Evaluation of Site-related Factors and Impact of Proposed Facilities

The regulatory body, when issuing license to operate a nuclear facility in accordance with the Reactor Regulation Law, conducts safety examination to ensure that siting and the basic design of facility, equipments and components of a major nuclear facility are adequate to prevent hazards due to nuclear fuel material or materials contaminated with it. The regulatory body uses examination guides in safety examination.

The Basic Guides for Safety Examination of Nuclear Fuel Facilities, one of the safety examination guides, provide that a site shall satisfy the following conditions:

- Basic conditions: No event liable to induce large accident is likely to occur at and near a proposed site of the nuclear fuel facility and there have also been very few events deemed liable to propagate disaster.
- Condition during normal operation: Radiation dose to which members of the public may be exposed during normal operations of a proposed nuclear fuel facility are kept ALARA.
- Condition at an accident: The maximum postulated accidents at the proposed nuclear fuel facility should not cause excessive exposure to the public.

These requirements are the same as those provided in the Guides for Safety Examination of Radioactive Waste Disposal Facility.

As for the basic conditions, the guides governing each type of facilities provide that operators must take into account the possible impacts from the natural environment such as earthquake, tidal wave, flood, typhoon, snowfall and other natural phenomena, as well as the possible impacts from the social environment of a fire and explosion at nearby factories, a falling object from an aircraft accident, etc.

Details of public exposure during normal operations, and in accidents, of nuclear facilities, are given in Section F.4. and in Section H.5.1., respectively.

Siting of a radioactive waste management facility attached to a reactor facility is examined in accordance with the Examination Guide for Nuclear Reactor Siting Evaluation and Application Criteria as part of examinations of the reactor facility.

The regulatory body, when issuing a license for operation of a radioisotope waste management facility in accordance with the Radiation Hazards Prevention Law, conducts safety examination using regulations and standards on the basis of the law, which provide that facilities should be located at a site where landslide or inundation is unlikely to occur, that main structures should be fireproof or fire-resistant, and that facility should be equipped with shielding walls for radiation protection.

Evaluation of disposal facilities after closure is described in the ensuing Section H.3.2.

H.3.2 Evaluation of Site-related Factors and Impact of Disposal Facilities

Evaluation of disposal facilities after closure is described in Section H.5.2. It should be noted that appropriate measures are to be taken when the siting conditions would have changed during institutional control after closure.

H.3.3 Information Disclosure

Information on the safety of nuclear facilities, including application documents, is made available to the public as part of administrative services. Moreover, government documents are made available to the public upon request made in accordance with the Law on the Disclosure of Information held by Administrative Agency, which came into force on April 1, 2001, unless reasons for non-disclosure apply.

Furthermore, application documents submitted by operators for licenses and other documents are available for public at the National Diet Library and other institutions.

Government documents containing information about the safety of radioisotope waste management facilities licensed under the Radiation Hazards Prevention Law are also available to the public upon request in accordance with the Law on the Disclosure of Information held by Administrative Agency, unless reasons for non-disclosure apply.

H.3.4 Relationship with Neighboring Countries

Being an insular country, Japan is located at a considerable distance from its neighboring countries. Therefore, as long as the safety of nuclear facilities is properly secured within Japan, nuclear facilities in the country are highly unlikely to have safety impacts on the neighboring countries. The Japanese government does not have it a rule to consult the neighboring countries about siting of nuclear facilities. The Japanese government provides neighboring countries with information on nuclear energy in the country through bilateral consultation, etc.

H.4 Design and Construction of Facilities (Article 14)

Each Contracting Party shall take the appropriate steps to ensure that:

(i) the design and construction of a radioactive waste management facility provide for suitable measures to limit possible radiological impacts on individuals, society and the environment, including those from discharges or uncontrolled releases;

(ii) at the design stage, conceptual plans and, as necessary, technical provisions for the decommissioning of a radioactive waste management facility other than a disposal facility are taken into account;

(iii) at the design stage, technical provisions for the closure of a disposal facility are prepared;

(iv) the technologies incorporated in the design and construction of a radioactive waste management facility are supported by experience, testing or analysis.

H.4.1 Limitation of Radiological Impacts on Individuals, Society and the Environment

The regulations under the Reactor Regulation Law provide that an applicant for a license for a nuclear facility should submit documents explaining: (i) meteorological conditions, the ground conditions, hydrological conditions, a social environment, and others at the site; (ii) safety design of the facility; (iii) radiation protection from nuclear fuel material (including spent fuel) and objects contaminated by it, and radioactive waste management; (iv) types, extent and possible consequences of postulated accidents at the facility initiated by operational error, equipment or system failure, earthquake, or a fire.

The regulatory body examines application and attached documents to confirm that appropriate measures are taken in the design to satisfy basic conditions, conditions during normal operations and conditions in an accident as mentioned in Section H.3.1.

The Reactor Regulation Law and its regulations require operators to take appropriate measures in the design to limit radiation hazards on individuals, society and the environment to ensure that:

(1) nuclear facility is capable of confining radioactive material to a limited section;
(2) proper radiation shield is provided to hold public exposure to direct radiation and skyshine rays sufficiently low.
(3) adequate radiation shield is provided for personnel engaged in radiation work considering the working conditions;
(4) appropriate measures are taken to oversee and manage the working environment for personnel engaged in radiation work;
(5) the concentration of radioactive material releases to the environment is kept ALARA by, for example, properly processing radioactive waste produced from storage facility;
(6) appropriate measures are taken to properly monitor the concentration of radioactive material at a radioactive waste discharge pathway; and
(7) appropriate safety precautions to cope with an accident, such as an emergency alarm system, a communication channel, and measures for evacuation of personnel engaged in radiation work, are taken.

The details about safety evaluation of an accident are described in Section H. 5.1.

Operators of major nuclear facilities, other than fuel material use facilities or disposal facilities, are required to submit a construction plan to the competent minister for approval, and undergo welding

inspections and pre-service inspections. The regulatory body confirms that the construction work has been carried out as approved and consistent with the technical standards. Pre-service inspections include various inspections and tests ranging from the components structure, strength or leakage inspections to the functions and performance tests of a nuclear facility as a whole.

Operator of fuel material use facility undergoes welding inspections, when necessary, and undergoes facility inspection by the regulatory body at each construction process and when all work is completed. The regulatory body confirms that the construction work has been carried out consistent with the technical standards.

Operator of disposal facility undergoes the Safety Verification of Disposal Facility by the regulatory body at a prescribed construction process.

Those intending to gain a license to conduct a radioisotope waste management business pursuant to the Radiation Hazards Prevention Law are obligated to submit a license application to the competent minister. The application must be accompanied by an explanatory statement setting forth the method of waste management and the locations, structure and equipment of waste refilling facilities and waste storage facilities and waste management facilities. The provisions concerning the location, structure and equipment of each facility require the applicant to take the appropriate steps to restrain possible radiological impacts to ensure that shielding walls, other shields, ventilation equipment, and effluent equipment are consistent with the following technical standards prescribed by laws and ordinances:

(1) shielding walls and other shields are capable of preventing the radiation exposure doses of occupational personnel engaged in radiation work, and on-site and off-site personnel from exceeding the respective dose limit;
(2) ventilation equipment is capable of holding the concentration of radioisotopes in the air at frequently entered places in working rooms and at the exhaust outlets down below the respective specified concentration limits;
(3) effluent equipment are capable of holding the concentration of radioisotopes in draining water or effluent down below the specified concentration limit; and
(4) the surface concentration of materials contaminated with radioisotopes in a working room is to be held down below the surface concentration limit.

Moreover, a license holder of radioisotope waste management business is obligated to undergo the regulatory body's Pre-Service Facility Inspections and obtain its validation that facilities comply with the technical standards.

H.4.2 Conceptual Plans and Technical Provisions for Decommissioning

The Reactor Regulation Law provides that operators other than operators of nuclear fuel material use facility and disposal facility shall, when dismantling a nuclear facility, submit to the competent minister in advance a notification providing a method of dismantling and a method of disposing of nuclear fuel material and materials contaminated with it.

Moreover, an operator of any kind of facilities shall, when terminating its business, notify the competent minister of that effect in accordance with the Reactor Regulation Law. The operator shall take measures to transfer or dispose of nuclear fuel material, and to decontaminate materials contaminated with it within 30 days. If necessary, the competent minister shall order the operator to implement measures to prevent hazards.

Under the Long-Term Program formulated by the AEC, dismantling technologies applicable to the decommissioning of commercial power reactors were developed by field tests conducted at dismantling

of the JPDR. The JPDR was dismantled in accordance with a NSC's decision, "Basic Concept of Securing the Safety of the Dismantling of Reactor Facilities: the Dismantling of the JPDR"*. The decision provided that a basic concept of ensuring safety of dismantling nuclear facilities should be based on experience of the JPDR and progress of dismantling technology in this country and in the foreign countries.

The Advisory Committee on Decommissioning, an advisory body to the then Ministry of International Trade and Industry (MITI), in January 1997, summarized tasks that should be addressed on decommissioning technology, safety measures and procedures, and the processing and disposal of waste. Moreover, based on data obtained from the dismantling of the JPDR, the Nuclear and Industrial Safety Subcommittee's Decommissioning Safety Subcommittee at the Advisory Committee for Natural Resources and Energy published a report in August 2001. In this report, the subcommittee spelled out concrete steps on planning for ensuring safety of decommissioning, on safety management, on decommissioning activity, on considerations in ensuring safety, and on a safety regulation. Nuclear business operators decommission nuclear facilities in accordance with the report.

Operator of a radioisotope waste management facility licensed under the Radiation Hazards Prevention Law shall, when terminating its business, give notice to that effect to the competent minister in accordance with the law and related regulations. The operator shall take measures to transfer or dispose of radioactive waste, and to decontaminate materials contaminated by radioisotopes within 30 days. If necessary, the competent minister shall order the operator to implement measures to prevent radiation hazards

* : In August 2001, the name of this decision was changed as "Basic Concept of Securing the Safety of the Dismantling of Reactor Facilities", and the content was revised partly.

H.4.3 Technical Provisions for the Closure of a Disposal Facility

Technical requirements for the closure of a disposal facility are prescribed by the Rules for Waste Disposal Facility for Nuclear Fuel Materials or Materials Contaminated with Nuclear Materials (Rules for Waste Disposal Facility). Table H.4-1 shows the technical requirements for waste disposal facility.

H.4.4 Steps to Support the Reliability of Technologies

Operators incorporate sufficiently time-tested domestic and foreign technologies in the design and construction of nuclear facilities.

Since 1976, the NSC has been promoting research on the safety of nuclear facilities, environmental radioactivity and radioactive waste. To respond to the possible expansion and diversification of nuclear power development and utilization, has the NSC utilized the results of safety research in the establishment of safety policy, basic principles, and various standards and guidelines.

From fiscal year 2001 onward, the relevant organizations have planned to implement research projects in the areas of near surface disposal, geological disposal, and clearance level, contributing to the establishment of standards on the disposal of radioactive waste (see Table B.4-2). Subjects of research include, in the area of near surface disposal, research on migration of radionuclides and safety analysis of disposal of radioactive waste from medical, industrial and research facilities, and, in the area of geological disposal, research on stability of geological environment and long-term behavior of engineered barriers and rock bed, and, in the area of clearance level, research on verification methods of clearance level of dismantled waste.

Table H.4-1 The Technical Requirements for Waste Disposal Facilities

(1) The cumulative amount of each radionuclides contained in all of radioactive waste packages emplaced in the disposal facility shall not exceed the amount of radioactivity of each radionuclide permitted for the disposal facility;

(2) Disposal facility shall be well drained off before start of emplacement, and rainwater shall be prevented to leak into the disposal facility after the start of emplacement;

(3) Off-site dispersion of radioactive material shall be prevented when non-solidified concrete scraps and other loose solids are emplaced;

(4) Disposal facility shall be tightly filled in with soil leaving no gaps beneath when emplacement is completed;

(5) Explosives, corrosives, and other hazardous materials shall not be emplaced at disposal facility;

(6) Surface of disposal facility, after emplacement is completed, shall be covered with soil less permeable to water than soil surrounding disposal facility; so that the equipments placed to the disposal facility will not be uncovered easily, and

(7) Engineered barrier, if any, shall meet following requirements:

- Engineered barrier structures shall be structurally strong enough to withstand self weight, soil pressure, and seismic force;
- Anti-corrosion steps shall be taken against surface water, groundwater and soil; and
- Appropriate measures shall be taken against destruction of equipment or leakage of radioactive material, if necessary.

Source: Article 6 of the Rules for Waste Disposal Facility

H.5 Assessment of Safety of Facilities (Article 15)

Each Contracting Party shall take the appropriate steps to ensure that:

(i) before construction of a radioactive waste management facility, a systematic safety assessment and an environmental assessment appropriate to the hazard presented by the facility and covering its operating lifetime shall be carried out;

(ii) in addition, before construction of a disposal facility, a systematic safety assessment and an environmental assessment for the period following closure shall be carried out and the results evaluated against the criteria established by the regulatory body;

(iii) before the operation of a radioactive waste management facility, updated and detailed versions of the safety assessment and of the environmental assessment shall be prepared when deemed necessary to complement the assessments referred to in paragraph (i).

H.5.1 Systematic Safety Assessment and Environmental Assessment

The competent minister, when issuing a license for a nuclear facility on the basis of the Reactor Regulation Law, requires the applicant to submit documents explaining meteorology, geology, hydrology and social environment of the site, and safety design of the facility, and examine them.

The safety examination guides, used to examine an application documents, require the applicant to perform safety assessment on the maximum postulated accidents in each nuclear facility prescribed in the guides, and confirm that these accidents do not cause excessive public exposure of radiation.

The safety examination guides require operators of reactor facilities and reprocessing facilities, which contain quantities of radioactive material, to perform both safety design assessment to confirm the adequacy of safety design of the facility and siting assessment to assess the isolation between the facility and the public from the point of view of radiation safety. Moreover, in a series of safety assessments, the guides require that postulated damage to radioactive waste management equipment does not cause excessive public exposure of radiation.

The competent minister, when issuing a license for a radioisotope waste management facility on the basis of the Radiation Hazards Prevention Law, requires the applicant to assess the shielding design and the radionuclide concentration at the exhaust of the ventilation equipment and at the site exit of drainage equipment, and confirms that the concentration limit specified in the regulations should not be exceeded.

H.5.2 Assessment for the Period following Closure of a Disposal Facility

The basic site conditions prescribed by the Guides for Safety Examination of Radioactive Waste Disposal Facility are that no event liable to induce large accident is likely to occur at and near the site for a waste disposal facility and there have also been very few events deemed liable to propagate disaster.

The regulatory body, when issuing license for waste disposal facility, confirms these conditions will remain valid during step-wise control (institutional control) following closure. Period of Step-wise control is supposed to be 300 to 400 years for disposal facilities with engineered barrier, and 50 years for disposal facilities without engineered barrier.

The details of institutional control are described in Section H.7.2.

H.5.3 Updating of Assessments Before Operation of Facilities

The Reactor Regulation Law provides that operators shall apply for alteration of license application of safety examination, when alteration of license is necessary to incorporate the latest technical knowledge, and that they shall apply for alteration to the Construction Plan, when major change in detailed design is necessary.

The Radiation Hazards Prevention Law also requires operators to apply for alteration to the license application of safety examination, when necessary.

H.6 Operation of Facilities (Article 16)

Each Contracting Party shall take the appropriate steps to ensure that:

(i) the licence to operate a radioactive waste management facility is based upon appropriate assessments as specified in Article 15 and is conditional on the completion of a commissioning programme demonstrating that the facility, as constructed, is consistent with design and safety requirements;

(ii) operational limits and conditions, derived from tests, operational experience and the assessments as specified in Article 15 are defined and revised as necessary;

(iii) operation, maintenance, monitoring, inspection and testing of a radioactive waste management facility are conducted in accordance with established procedures. For a disposal facility the results thus obtained shall be used to verify and to review the validity of assumptions made and to update the assessments as specified in Article 15 for the period after closure;

(iv) engineering and technical support in all safety-related fields are available throughout the operating lifetime of a radioactive waste management facility;

(v) procedures for characterization and segregation of radioactive waste are applied;

(vi) incidents significant to safety are reported in a timely manner by the holder of the licence to the regulatory body;

(vii) programmes to collect and analyse relevant operating experience are established and that the results are acted upon, where appropriate;

(viii) decommissioning plans for a radioactive waste management facility other than a disposal facility are prepared and updated, as necessary, using information obtained during the operating lifetime of that facility, and are reviewed by the regulatory body;

(ix) plans for the closure of a disposal facility are prepared and updated, as necessary, using information obtained during the operating lifetime of that facility and are reviewed by the regulatory body.

H.6.1 Verification through Pre-service Inspection

A operator (excluding operator of waste disposal facility), in accordance with the Reactor Regulation Law or the Electric Utilities Industry Law, prepares Construction Plan and submits it to the regulatory body for approval. Also, the operator undergoes the regulatory body's pre-service inspection at each construction process and at the end of all construction works, to verify that the construction is completed as approved and is consistent with the technical requirements. Passing Pre-service inspections, the operator is allowed to commence operation of the facility.

Operator of a waste disposal facility, in accordance with the Rules for Waste Disposal Facility, undergoes the Safety Verification of Disposal Facility by the regulatory body at a prescribed construction process.

Operator of a radioisotope waste management facility licensed under the Radiation Hazards Prevention Law undergoes the Facility Inspections by the regulatory body. Passing the inspection, the operator is allowed to commence operation of the facility.

H.6.2 Operational Requirements and Conditions

Operator licensed under the Reactor Regulation Law, before the start of operation, notifies the regulatory body of the Operational Plan and prepares the Safety Preservation Rules specifying methods of operation, inspection and radiation monitoring and submit it to the regulatory body for approval. The Safety Preservation Rules shall specify operational limits, and the facility shall be operated and maintained in compliance with the rules. Table H.6-1 shows the contents of the Safety Preservation Rules of a waste disposal facility. The regulatory body, finding noncompliance with the operational requirements, orders the operator to take corrective measures.

Operator assigns, a Chief Engineer of Reactor, a Supervisor of Nuclear Fuel Material, a Supervisor of Spent Fuel or a Supervisor of Radioactive Waste, who has passed national examinations, and is put in charge of overseeing safety in the operation of a nuclear facility.

Operator licensed under the Radiation Hazards Prevention Law, before the start of operation, prepares the Internal Rules for Prevention of Radiation Hazards specifying inspections, radiation monitoring and radioactive waste processing, and notifies it to the regulatory body. The Internal Rules shall specify operational requirements, and the facility shall be operated and maintained in compliance with the rules. Table H.6-2 shows the details of the Internal Rules. Also, operator assigns, from among qualified persons, a Supervisor of Radiation Protection who is put in charge of overseeing prevention of radiation hazards in operation of facility.

H.6.3 Procedures of Operation and Updating of Assessment of a Disposal Facility

In accordance with the Reactor Regulation Law, the Electric Utilities Industry Law, or the Radiation Hazards Prevention Law, operator of a nuclear facility, during the operation of nuclear facilities, is required to undergo the following inspections.

(1) Nuclear Facilities Subject to the Reactor Regulations Law

1) Periodical Facility Inspection

The regulatory body conducts Periodical Facility Inspections (excluding disposal facilities) once a year (once every 13 months in the case of commercial power reactor facilities) to see if the performance of the facilities and equipment complies with the technical standards.

2) Nuclear Safety Inspection

The regulatory body posts Nuclear Safety Inspector to each nuclear facility to conduct the Nuclear Safety Inspection four times a year to supervise the compliance with the Safety Preservation Rules and release the results to the public the results.

3) Safety Verification of Radioactive Waste Packages

The regulatory body, or a body designated by it, conducts Safety Verification of Radioactive Waste Packages each time when waste packages are emplaced in disposal facilities. Table H.6-3 shows the technical standards used in Safety Verification of Radioactive Waste Packages.

For the purpose of updating assessment of a disposal facility, the regulatory body, in accordance with the Rules for Waste Disposal Facility, conducts the Safety Verification of Disposal Facility once again when the facility is covered with soil and closed, and confirms compliance with the technical

standards, one of which prescribes that the cumulative amount of radioactivity of each radionuclide contained in all of radioactive waste packages emplaced in the disposal facility shall not exceed the amount of radioactivity of each radionuclide permitted for the disposal facility. The operator, in accordance with the Rules for Waste Disposal Facility Business, keeps records of disposal, including the results of the Safety Verification of Disposal Facility, until the waste disposal business is terminated.

(2) Radioisotope Waste Management Business Facilities Subject to the Radiation Hazards Prevention Law

1) Periodical Inspection

The regulatory body conducts Periodical Facility Inspections once every three years to see if the performance of the facilities and equipment complies with the technical standards.

2) On-the-Spot Inspection

The regulatory body sends Radiation Inspector to the facility to conduct On-the-Spot Inspections as necessity arises.

H.6.4 Technical Support throughout the Operating Lifetime

Throughout the operating lifetime of a nuclear facility, the regulatory body obtains engineering and technical advice from advisory committees, which are composed of experts on operational management, inspection and radiation control, and makes the advice reflected in the operation, maintenance and safety regulation as necessary.

The NSC, as described in Section H.4.4, has been promoting research project on safety of radioactive waste disposal and other research projects, which have been implemented by JAERI, JNC and other institutes.

Meanwhile, nuclear business operators are collecting information on operating experience both domestic and abroad, and accumulating the up-to-date technological knowledge through the self-financed development project or their own maintenance activities

H.6.5 Characterization and Segregation of Radioactive Waste

The Reactor Regulation Law provides that radioactive waste shall be discharged, processed, stored or disposed of by any of the following methods according to types of radioactive wastes:

(1) Gaseous radioactive waste:
1) Gaseous radioactive waste shall be discharged through ventilation facilities; or
2) Gaseous radioactive waste shall be stored in tanks capable of preventing radiation hazards.

(2) Liquid radioactive waste:
1) Liquid radioactive waste shall be discharged through discharge facilities (including discharge into ocean);
2) Liquid radioactive waste shall be stored in liquid waste storage tanks capable of preventing radiation hazards;
3) Liquid radioactive waste shall be packaged or solidified in a container, which shall be stored in a

storage facility capable of preventing radiation hazards;

4) Liquid radioactive waste shall be incinerated in an incinerator capable of preventing radiation hazards; or
5) Liquid radioactive waste shall be solidified in a solidification facility capable of preventing radiation hazards.

(3) Solid Radioactive Waste:

1) Solid radioactive waste shall be incinerated in an incinerator capable of preventing radiation hazards;
2) Solid (loose) radioactive waste shall be sealed or solidified in a container, which shall be stored in a storage facility capable of preventing radiation hazards;
3) Radioactive wastes such as large machines or radioactive wastes waiting for decay of radioactivity shall be stored in a storage facility capable of preventing radiation hazards; or
4) Solid radioactive waste shall be emplaced in a disposal facility in accordance with the technical standards on waste disposal facilities and waste packages.

The Ordinance of the Reactor Regulation Law classifies radioactive waste to be disposed of into five categories as is shown in Table H.6-4, and prescribes upper bounds of radioactivity of each radionuclide for each category.

The Radiation Hazards Prevention Law provides that radioactive waste shall be discharged, processed or stored by any of the following methods according to types of radioactive wastes:

(1) Gaseous Radioactive Waste:

1) Gaseous radioactive waste shall be cleansed or discharged through ventilation equipment.

(2) Liquid Radioactive Waste:

1) Liquid radioactive waste shall be cleansed or discharged through discharge facilities;
2) Liquid radioactive waste shall be packaged in a container or solidified with concrete or other solidifying material in a container at a solidification facility, and the container shall be stored in a storage facility;
3) Liquid radioactive waste shall be incinerated in an incinerator; or
4) Liquid radioactive waste shall be solidified with concrete or other solidifying material in a solidification facility.

(3) Solid Radioactive Waste:

1) Solid radioactive waste shall be incinerated in an incinerator;
2) Solid radioactive waste shall be packaged in a container or solidified with concrete or other solidifying material in a container at a solidification facility, and the container shall be stored in a storage facility; or
3) Radioactive wastes of large machines, which are hard to be packaged in a container, shall be stored in a storage facility with special measures preventing spread of contamination.

H.6.6 Reporting of Incidents and Failures

The Reactor Regulation Law or the Electric Utilities Industry Law require operators to report to the regulatory body about the situation and the measures taken to incidents or failures at major nuclear facilities. The reporting criteria prescribed in these laws for waste disposal facility are shown in Table H.6-5. Furthermore some minor failures below the criteria are also to be reported under a ministerial notification of METI. The regulatory body is further encouraging operators to feedback the measures to prevent a recurrence to other nuclear facilities as well.

Operators of radioisotope waste management facilities subject to the Radiation Hazards Prevention Law, in accordance with the law, also report to the regulatory body on the details of major incidents occurred at the facilities and corrective measures taken. Table H.6-6 shows the reporting standards under the Radiation Hazards Prevention Law.

H.6.7 Reflecting Operating Experience

Upon receipt of a report on an incident at a major nuclear facility, as noted in the preceding section, the regulatory body publishes to the public immediately of the incident and also publishes the cause and measures to prevent similar incidents when they become available. Moreover, the regulatory body scrutinizes the cause of each of the incidents at nuclear facilities soliciting advice from committees composed of experts on operational management, inspection and radiation control, draws lessons from incidents, and requires lessons learned should be implemented upon in the operation, maintenance or safety regulations where appropriate.

Furthermore, the regulatory body entrusts its supporting organization to collect and analyze information about operating experience both at domestic and overseas nuclear facilities, and to provide information to relevant organizations. The regulatory body has international mechanism to share information on incidents and accidents through international organizations, such as the IAEA and the OECD/NEA, as well as under bilateral cooperation agreements.

Meanwhile, electric utilities are collecting and analyzing information about operating experience, both domestic and abroad, within themselves and at CRIEPI. Also they have international mechanism to exchange information through INPO and WANO Tokyo Center. Moreover, some of electric utilities have information exchange agreements electric utilities or reactor manufacturers in France, Germany, the United States and other countries. Recognizing the importance of sharing safety information and nurturing safety culture throughout the nuclear industry, related organizations jointly established a private institute “NS Net” in December 1999. The NS Net performs peer reviews and other routine activities.

H.6.8 Preparation of Plans for Decommissioning of Nuclear facilities

An operator with a license issued under the Reactor Regulation Law, in order to terminate the business, shall take measures to transfer nuclear fuel material in its possession and decontaminate materials contaminated by nuclear fuel material, and report to the regulatory body about the measures taken. Moreover, as mentioned in Section H.4.2, operators other than operators of fuel material use facility and disposal facility, when dismantling a nuclear facility, submit to the regulatory body, in advance, a notification providing method of dismantling and method of disposing of nuclear fuel material and materials contaminated with it.

Operator of a radioisotope waste management facility licensed under the Radiation Hazards Prevention Law, in order to terminate the business, shall take measures to transfer radioisotopes in its possession, decontaminate materials contaminated by radioisotopes, and transfer contaminated materials, and report to the regulatory body about the measures taken.

H.6.9 Preparation of Plans for the Closure of Disposal Facilities

Operator of a waste disposal facility, when applying for a license, is required to submit a plan for closure

of the disposal facility and a plan after closure, and obtain approval of the regulatory body. Moreover, the operator, when closing a disposal facility, shall undergo the Safety Verification of Disposal Facility by the regulatory body, as mentioned in Section H.4.3.

Table H.6-1 Contents of the Safety Preservation Rules for Radioactive Waste Disposal Facility

1. Duties and organization of personnel engaged in the management of radioactive waste disposal facility
2. Safety education for personnel engaged in radiation work at disposal facility concerning:
   (1) Safety education policy (including its implementation plan);
   (2) Details of safety education concerning:
      1) related laws, regulations and Safety Preservation Rules;
      2) structure, performance and operation of disposal facility;
      3) radiation control;
      4) handling of nuclear fuel material and materials contaminated by nuclear fuel material; and
      5) emergency preparedness;
   (3) Other necessary matters concerning safety education;
3. Steps to be taken for the safety preservation of disposal facility taking account of attenuation of radioactivity;
4. Establishment of a controlled area, a peripheral monitoring area and preservation area of a disposal facility, and restriction of access to these areas;
5. Gaseous and liquid discharge monitoring equipment;
6. Monitoring of dose, dose equivalent, radioactive material concentration and surface contamination by radioactive materials, and decontamination works;
7. Management of radiation monitoring equipment and monitoring method;
8. Patrol and inspection of disposal facility and measures to be taken after patrol and inspection;
9. Receipt, transport, storage and handling of radioactive waste;
10. Emergency preparedness;
11. Records of the safety of disposal facility (including compliance with the Safety Preservation Rules); and
12. Other matters necessary for the safety preservation of disposal facility.

Table H.6-2 Examples of Details of the Internal Rules for the Prevention of Radiation Hazards

1. Duties and an organization of personnel engaged in the handling of radioisotopes, etc.
2. Duties and an organization of the Supervisor of Radiation Protection and personnel engaged in the management of safety in the handling of radioisotopes, etc.
3. Appointment of a person acting in place of a Supervisor of Radiation Protection
4. Maintenance and management of radiation handling facilities
5. Inspections of radiation handling facilities (or a controlled area)
6. Use of radioisotopes, etc.
7. Repacking, storage, transport or waste management of radioisotopes, etc.
8. Measurement, recording and preservation of records of radiation doses and contamination with radioisotopes
9. Education and training necessary for the prevention of radiation hazards
10. Medical examinations
11. Measures needed for the health of persons who have suffered or are suspected to have suffered from radiation hazards
12. Keeping and maintenance of books on the storage or disposal of radioisotopes, etc.
13. Emergency measures for dealing with an earthquake, a fire and other disaster (excluding those measures mentioned in the ensuing 14)
14. Emergency measures in case of danger
15. Reporting on situation of radiation control
16. Other matters necessary for the prevention of radiation hazards

Table H.6-3 Technical Standards for Safety Verification of Radioactive Waste Packages

1. Standards Concerning Waste Packages
   (1) Waste packages shall be solidified in containers;
   (2) Radioactive concentration shall not exceed the maximum radioactive concentration as applied.
   (3) Surface concentration of radioactive material shall be in compliance with laws and regulations;
   (4) Waste packages shall not contain any material that impairs its integrity;
   (5) Waste packages shall have the strength to withstand a load at emplacement;
   (6) Waste packages shall be free from large damage; and
   (7) Waste packages shall have markers for collation.
2. Standards Concerning Large Metal Waste Packages
   (1) Radioactive concentration shall not exceed the maximum radioactive concentration as applied;
   (2) Surface concentration of radioactive material shall be in compliance with laws and regulations;
   (3) Waste packages shall not contain any material that impairs its integrity;
   (4) Waste packages shall have the strength to withstand a load at emplacement;
   (5) Waste packages shall be free from remarkable damage;
   (6) Waste packages shall have markers for collation; and
   (7) Openings of large metal waste packages shall be sealed or otherwise processed.
3. Standards Concerning Concrete Scraps and Other Non-Solidified Waste Packages
   (1) Radioactive concentration shall not exceed the maximum radioactive concentration as applied;
   (2) Waste packages shall not contain explosive material; and
   (3) Waste packages shall be designed to allow collation.

Source: Article 8 of the Regulations Concerning Waste Disposal Business of Nuclear Fuel Material or Materials Contaminated by Nuclear Fuel Material

Table H.6-4 Classification of Radioactive Wastes from Reactor Facilities and the Concept of Disposal

1. Radioactive wastes generated at reactor facilities, to be disposed of at near surface disposal facility with engineered barrier:

   (1) Radioactive wastes solidified in containers, and
   (2) Metal radioactive wastes whose openings are sealed or otherwise processed.

2. Radioactive wastes from dismantling of reactor facilities including concrete scrap, reinforcing bars and other materials solidified in containers, to be disposed of at near surface disposal facility with engineered barrier.

3. Radioactive wastes generated at reactor facilities not solidified in containers, to be disposed of at near surface disposal facility with concrete vault.

4. Radioactive concrete scraps and other wastes from dismantling reactor facilities, to be disposed of at near surface disposal facility without engineered barrier.

5. Radioactive wastes generated at rector facilities, such as reactor internals, to be disposed of at sub surface disposal facility:

   (1) Wastes solidified in containers; and

   (2) Other solid wastes.

The regulations provide for the radioactive nuclide upper bounds for each category 1. through 5..

Source: Rewritten for simplification on the basis of Article 13-9 of the Ordinance for the Regulation of Nuclear Source Material, Nuclear Fuel Material and Reactors

Table H.6-5 The Incidents Reporting Criteria at Disposal Facilities in Accordance with the Reactor Regulation Law

Upon occurrence of any of the following incidents, operator of disposal facility shall immediately give notice to that effect to the regulatory body, and report within ten days on the details of the event and corrective actions taken:

1. Nuclear fuel material being stolen or missing;
2. Failure of disposal facility (excluding minor failure);
3. Atmospheric radiation monitoring outside peripheral monitoring area exceeding limit because of gaseous waste discharge;
4. Radiation monitoring of discharge at the outer boundary of peripheral monitoring area exceeding limit because of liquid waste discharge;
5. Leakage of nuclear fuel material, etc. inside controlled area and remedial activities, such as access control, control of keys, etc., or leakage of nuclear fuel material, etc. outside controlled area;
6. Exposure of personnel engaged in radiation work to radiation exceeding or likely to exceed dose limits; or
7. Any other hazards to personnel occurring or likely to occur at the facility (excluding minor non-radiation hazards).;

Source: Article 27-2 of the Regulations Concerning Waste Disposal Facilities of Nuclear Fuel Material or Materials Contaminated by Nuclear Fuel Material

Table H.6-6 The Accident and Failure Reporting Standards in accordance with the Radiation Hazards Prevention Law

Upon the occurrence of any one of the following events, operators of nuclear business shall immediately give notice on the effects to the Minister of MEXT and report to the minister about the situation of the event and appropriate action taken within ten days of the event:

1. Theft or missing of radioisotope has occurred;
2. Radioisotopes, etc. have abnormally leaked;
3. Occupational Personnel engaged in radioisotope handling have been exposed to radiation that has exceeded or is likely to exceed the effective dose limits or the equivalent dose limits; or
4. In other cases, radiation hazards have occurred or are likely to occur.

Source: Article 39, Paragraph 1, of the Rules for the Enforcement of the Law Concerning Prevention of the Radiation Hazards Due to Radioisotopes, etc.

H.7 Institutional Measures after Closure (Article 17)

Each Contracting Party shall take the appropriate steps to ensure that after closure of a disposal facility:

(i) records of the location, design and inventory of that facility required by the regulatory body are preserved;

(ii) active or passive institutional controls such as monitoring or access restrictions are carried out, if required; and

(iii) if, during any period of active institutional control, an unplanned release of radioactive materials into the environment is detected, intervention measures are implemented, if necessary.

H.7.1 Records Keeping of Waste Disposal Facilities

Operators shall keep and preserve records of the waste disposal facilities for a period of time as prescribed by laws and regulations. The operator shall keep records of:

- radioactive waste packages emplaced in the disposal facility;
- radiation control;
- maintenance records;
- incidents at the disposal facility;
- rainfall;
- groundwater level; and
- safety education.

H.7.2 Implementation of Institutional Controls

The Guides for Safety Examination of Radioactive Waste Disposal Facilities, established by the NSC, require that operators of disposal facilities should, in accordance with the ALARA principle, manage a disposal facility taking account of types and radioactivity levels of waste, until the radioactivity of waste emplaced in a near surface disposal facility decays with the lapse of time to the level as low as it poses no safety hazards to the public (hereinafter referred to as Step-wise Control).

The regulatory body requests applicant for waste disposal business license to submit a Step-wise Control plan and examines it to see if it meets the requirements specified in the Guides for Safety Examination of Radioactive Waste Disposal Facilities, which is as follows.

(1) A disposal facility with engineered barrier (emplacement of waste package with container in concrete vault):

1) The First Stage:

A peripheral monitoring area where access is controlled, and a disposal facility preservation area where patrol and inspection are conducted, are established. Leakage of radioactive materials out of engineered barrier is monitored, and if leakage occurs remedial measures are taken. (Monitoring and prevention of leakage from engineered barriers)

2) The Second Stage:

A peripheral monitoring area where access is controlled, and a disposal facility preservation area where patrol and inspection are conducted, are established. Leakage of radioactive materials out of engineered barrier through groundwater to the living environment is monitored. (Monitoring of leakage and migration from engineered barrier, and retardation of migration by natural and engineered barriers)

3) The Third Stage:

A disposal facility preservation area where patrol and inspection are conducted is established. Farming and other specific activities in this area are restricted or prohibited. (Retardation of migration by natural barrier, and prohibition or restriction of specific activities)

(2) A disposal facility without engineered barrier (emplacement of concrete scraps without container in trench)

1) The Disposal Stage:

A peripheral monitoring area where access is controlled, and a disposal facility preservation area where patrol and inspection are conducted, are established. Leakage of radioactive materials out of disposal facility through groundwater to the living environment is monitored. (Retardation and monitoring of migration into the living environment)

2) The Preservation Stage:

A disposal facility preservation area where patrol and inspection are conducted is established. Farming and other specific activities in this area are restricted or prohibited (Retardation of migration into the living environment, and prohibition or restriction of specific activities)

The control period is supposed to last 300 to 400 years for a disposal facility with engineered barrier, and the end of control period for a disposal facility without engineered barrier is supposed to be 50 years after covered soil is stabilized.

H.7.3 Intervention Measures if Necessary

When issuing a license, the regulatory body requests operator to take following steps during each stage.

In the First Stage, if a leakage of radioactive material from engineered barriers is detected, the operator should immediately repair the disposal facility to prevent leakage. In the Second Stage, the operator should monitor leakages from engineered barriers and, if necessary, implement steps to retardate migration of radioactive material. At the same time, the operator should inspect the disposal facility and, if necessary, fix covered soil and others. In the Third Stage, the operator should conduct patrol and inspection to prevent any action specified in regulations, and, if necessary, fix covered soil, etc.

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I. Transboundary Movement

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Section I. Transboundary Movement (Article 27)

1. Each Contracting Party involved in transboundary movement shall take the appropriate steps to ensure that such movement is undertaken in a manner consistent with the provisions of this Convention and relevant binding international instruments. In so doing:

(i) a Contracting Party which is a State of origin shall take the appropriate steps to ensure that transboundary movement is authorized and takes place only with the prior notification and consent of the State of destination;

(ii) transboundary movement through States of transit shall be subject to those international obligations which are relevant to the particular modes of transport utilized;

(iii) a Contracting Party which is a State of destination shall consent to a transboundary movement only if it has the administrative and technical capacity, as well as the regulatory structure, needed to manage the spent fuel or the radioactive waste in a manner consistent with this Convention;

(iv) a Contracting Party which is a State of origin shall authorize a transboundary movement only if it can satisfy itself in accordance with the consent of the State of destination that the requirements of subparagraph (iii) are met prior to transboundary movement;

(v) a Contracting Party which is a State of origin shall take the appropriate steps to permit re-entry into its territory, if a transboundary movement is not or cannot be completed in conformity with this Article, unless an alternative safe arrangement can be made.

2. A Contracting Party shall not licence the shipment of its spent fuel or radioactive waste to a destination south of latitude 60 degrees South for storage or disposal.

3. Nothing in this Convention prejudices or affects:

(i) the exercise, by ships and aircraft of all States, of maritime, river and air navigation rights and freedoms, as provided for in international law;

(ii) rights of a Contracting Party to which radioactive waste is exported for processing to return, or provide for the return of, the radioactive waste and other products after treatment to the State of origin;

(iii) the right of a Contracting Party to export its spent fuel for reprocessing;

(iv) rights of a Contracting Party to which spent fuel is exported for reprocessing to return, or provide for the return of, radioactive waste and other products resulting from reprocessing operations to the State of origin.

The electric utilities in Japan have concluded reprocessing contracts with British and French firms and have exported 7,100 tons of spent fuel between 1969 and 2001.They, in return, receive new nuclear fuel material recovered from the spent fuel and vitrified packages (HLW) generated in the reprocessing. Six hundred and sixteen vitrified packages were sent back to Japan between 1995 and March 2003 and the remaining packages will be returned in the next ten-odd years. As they started constructing a reprocessing plant at Rokkasho-Mura in Aomori Prefecture in 1993, there would be no plan to export more spent fuel after 2002, with an exception of the US produced fuel for research reactor (which should be returned under the bilateral agreement between Japan and the US.)

I. 1 Transboundary Movement

I. 1. 1 Steps to Ensure Prior Notification and Consent of the State of Destination

For the export of the spent fuel or the radioactive waste, the Foreign Exchange and Foreign Trade Control Law provides that an applicant should apply for and obtain the Export Permit from the Minister of METI. This Export Permit should be applied once it is confirmed that the authorities of the State of destination recognized the administrative and technical capacity of the importer.

I. 1. 2 Steps to Ensure Transboundary Movement Subject to International Obligations

Japanese domestic laws, such as the Ship Safety Law, etc, have incorporated obligations under the IAEA Regulations for the Safe Transport of Radioactive Materials and relevant international conventions on each mode of transport, such as International Convention for the Safety of Life at Sea (SOLAS), etc.

I. 1. 3 Consent as a State of Destination

After being notified by a State of origin of a transboundary movement to Japan of the spent fuel or the radioactive waste, the government of Japan decides whether it gives consent to the transport, and notifies its decision to the State of origin.

Japan expressed that, upon notification from a State of origin, it would consent to the import of returned radioactive waste as long as such transport would comply with the safety regulation of Japan.

I. 1. 4 Confirmation of the Capacity of a State of Destination

The Foreign Exchange and Foreign Trade Control Law provides that an exporter should apply for and obtain the Export Permit from the Minister of METI for the export of the spent fuel or the radioactive waste. The Minister of METI issues the Export Permit after confirming the general conditions of safety of the country of destination such as its regulatory structure, the membership in relevant international agreements, and the administrative and technical capacity of the importing body. In other words, the export shall be permitted only if it is confirmed that importing body has administrative and technical capacity of management of spent fuel and radioactive waste.

I. 1. 5 Steps to Permit Re-entry in case of Uncompleted Transboundary Movement

The Import Trade Control Order allows, as special exemption, re-entry of exported goods, in case of uncompleted transboundary movement so long as original characteristics and configuration of exported goods are preserved, and the other case of the exemption is a transport accident. Re-entry of exported spent fuel and radioactive waste is allowed by that provision.

I. 2 Steps to Ban Shipment to a Destination South of Latitude 60˚ South

The Foreign Exchange and Foreign Trade Control Law provides that an applicant should apply for and obtain the Export Permit from the Minister of METI for the export of the spent fuel or the radioactive waste. The Export Permit shall not be granted for the export of spent fuel or radioactive waste to a

destination south of latitude 60 degrees south for storage or disposal.

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J. Disused Sealed Sources

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Section J. Disused Sealed Sources (Article 28)

1. Each Contracting Party shall, in the framework of its national law, take the appropriate steps to ensure that the possession, remanufacturing or disposal of disused sealed sources takes place in a safe manner.
2. A Contracting Party shall allow for reentry into its territory of disused sealed sources if, in the framework of its national law, it has accepted that they be returned to a manufacturer qualified to receive and possess the disused sealed sources.

J.1 Standards for the Storage of Disused Sealed Sources

In Japan, only business operators who are authorized in accordance with the Radiation Hazards Prevention Law can handle sealed sources. Actually, disused sealed sources are transferred or taken over as sealed sources by such authorized business operators. The storage of sealed sources for possession or renewing is subject to the following storage standards specified in above mentioned laws and relevant regulations.

(1) Sealed sources shall be put in containers and stored in storage pits or bins.
(2) Sealed sources shall not be stored in quantities exceeding storage capacity.
(3) Appropriate steps, such as 1) installing a shield, 2) distancing personnel from sealed sources, and 3) shortening the time during which personnel may be exposed to radiation, shall be taken in order to prevent personnel engaged in handling of radioactive substances from being exposed to radiation exceeding the effective dose limit.
(4) Appropriate steps, such as immobilizing storage bins, shall be taken in order to prevent containers storing sealed sources from being carried from one place to another without permission.
(5) Appropriate steps shall be taken in order to keep the air concentration of radioisotopes in storage facilities from exceeding the concentration limit.
(6) Personnel shall be prohibited from eating, drinking or smoking in a place where an oral intake may occur.
(7) Appropriate steps shall be taken to prevent surface contamination from exceeding the surface contamination limit.
(8) Radioactive contaminated substances whose surface concentration exceeds one-tenth of the surface concentration limit shall not be transported from the controlled area without permission.
(9) Appropriate steps shall be taken in order to prevent unauthorized persons from entering the controlled area.

J.2 Reentry of Returning Sealed Sources

As long as a manufacturer has permission and meets the standards specified in the Radiation Hazards Prevention Law, reentry of approved type of sealed sources returning from abroad are allowed within the permission of storage capacity. In this case, the manufacturer intending to possess or renew returned sealed sources is required to store them in accordance with the above mentioned storage standards.

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K. Planned Activities to Improve Safety

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Section K. Planned Activities to Improve Safety

Activities aimed at improving safety have already been described in the preceding sections. This section summarizes planned activities for improving safety.

(1) Preparation of Laws and Ordinances

Table B.3-2 shows the status of activities concerning preparation of regulation on radioactive waste disposal. These activities will continue.

(2) Safety of Existing Spent Fuel and Radioactive Management Facilities (G.2.1&H.2.1)

The regulatory body conducts periodical inspections and safety checks at spent fuel management facilities and radioactive waste management facilities to confirm the safety of existing facilities. The regulatory body will continue these activities. The NSC independently monitors and reviews the situation and adequacy of regulatory activities. The NSC will intensively continue these activities.

(3) Quality Assurance (QA) Activities

Regulatory requirements on QA activities concerning spent fuel management and radioactive waste management are to be intensified reflecting the lessons learned from the falsification on voluntary inspection activities by Tokyo Electric Power Company. NISA is now establishing new regulatory activities pertaining to QA and inspections.

(4) Emergency Drills and Exercises (F5.1.3)

The important objective of drills in emergency preparedness is to make sure that responsible agencies and officials of the national and local governments, nuclear business operators, and members of the public have a clear understanding measures for nuclear emergency and respond properly in an emergency. These activities, including participation in international exercises, will continue.

(5) Steps to Support Reliability of Technology (G.4.3 & H.4.4)

Since fiscal year 1976, the NSC has been promoting research projects concerning the safety of environmental radioactivity and radioactive waste at nuclear installations. The products of these safety research projects have been reflected in the formulation of various standards and guidelines, including principles such as safety policy and basic ideas, standards on specific means of achieving safety, and specific guidance.

From fiscal 2001 on, the commission plans to carry out research projects in the fields of near surface disposal, geological disposal, and clearance, based on the formulation of standards on radioactive waste disposal (see Table B.4-2).
These activities will continue.