National Report of Japan
for the Fifth Review Meeting

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

October, 2014

ministry of Foreign Affairs
ministry of Education, Culture, Sports, Science and Technology
ministry of Health, labour and welfare
ministry of Economy, Trade and industry
Nuclear Regulation Authority

Contents

List of Acronyms and Abbreviations

Acronym	Name
DCA	Deuterium Criticality Assembly
EAL	Emergency Action Level
HLW	High Level Waste
HTR	Hitachi Ltd.'s Hitachi Training Reactor
ICRP	The International Commission on Radiological Protection
JAEA	Japan Atomic Energy Agency
JAPCO	The Japan Atomic Power Company
JNES	The Japan Nuclear Energy Safety Organization
JNFL	The Japan Nuclear Fuel Ltd.
LWRs	Light Water Reactors
METI	Ministry of Economy, Trade and Industry
MEXT	Ministry of Education, Culture, Sports, Science and Technology
MHLW	Ministry of Health, Labour and Welfare
MOE	Ministry of the Environmental
MOFA	Ministry of Foreign Affairs
NCAA	National Competent Authority for an Emergency Abroad
NCAD	The National Competent Authority for a Domestic Emergency
NISA	The Nuclear and Industrial Safety Agency
NPS	Nuclear Power Station
NRA	The Nuclear Regulation Authority
NUMO	The Nuclear Waste Management Organization of Japan
NWP	The National Warning Point
OIL	Operational Intervention Level
PAZ	Precautionary Action Zone
PFSB	The Pharmaceutical and Food Safety Bureau
RANET	The IAEA Response Assistance Network
RFS	Recyclable-Fuel Storage Company
RUR	The Rikkyo University Institute for Atomic Energy
TEPCO	Tokyo Electric Power Company
TTR-1	Toshiba Corporation's Training Reactor-1
UPZ	Urgent Protective action planning Zone

Section A Introduction

1 Current status of nuclear energy use in Japan

In light of the lessons learned from the Tokyo Electric Power Company's Fukushima Daiichi Nuclear Power Station (Fukushima Daiichi NPS) accident on March 11, 2011, the Nuclear Regulation Authority (NRA) was established in September 2012. The NRA has centralized responsibility not only for the administration of nuclear regulation and nuclear security, which were previously handled by related administrative bodies, but also for the formulation of Nuclear Emergency Response Guidelines in accordance with the provisions of the Nuclear Emergency Act and the Act on Special Measures Concerning Nuclear Emergency Preparedness. The NRA has also been responsible since April 2013 for administrative matters concerning safeguards based on international commitments and the regulation of activities such as radiation monitoring and the use of radioactive isotopes.

The Japan Nuclear Energy Safety Organization (JNES), and its role as a technical support organization, were merged into the NRA effective March 1, 2014.

After the accident, each nuclear power plant was accordingly shut down at the time of its scheduled periodic facility inspection and by May 2012, all nuclear power stations had suspended operations. Units 3 and 4 at the Kansai Electric Power Company's Ohi Power Station resumed operations in June 2012, but they too subsequently underwent periodic facility inspections and as of August 2014, there are no nuclear power stations in operation in Japan.

Japan has 48 power reactor units in service at the end of March 2014, following the decision to decommission Units 1 to 6 at the Fukushima Daiichi NPS. Japan's other nuclear facilities are as follows: 6 nuclear fuel fabrication facilities include 2 uranium enrichment facilities, 2 spent fuel reprocessing facilities, 2 radioactive waste interim storage facilities, 2 radioactive waste repositories, 14 research reactors, 8 research reactors currently under decommissioning, and 15 facilities which use more than a certain quantity of uranium or other nuclear fuel material.

2 Efforts concerning the safety of spent fuel management and radioactive waste management

Japan is conducting a fundamental review of its nuclear regulations in response to the accident at the Fukushima Daiichi NPS. The NRA put into force new regulatory requirements for nuclear power stations in July 2013, and those for nuclear fuel facilities in December 2013. The NRA began comformity reviews with the new regulatory requirements of nuclear power stations applied from July 2013, and of nuclear fuel facilities applied from January 2014.

In addition, regarding Fukushima Daiichi NPS, the NRA designated the facilities needed special control after emergency responses to the nuclear emergency situation to be as the "Specified Nuclear Power Facilities" in November 2012, in order to control them for operational safety in

appropriate manners responding to the situations of the facilities, in accordance with the Act of Regulation of Nuclear Source Material, Nuclear Fuel and Reactors which was revised with the establishment of the NRA. Furthermore, the NRA indicated TEPCO the "items required for measures." After that, on August 2013, the NRA approved TEPCO's implementation plan in accordance with the measures indicated by the NRA. The NRA conducts the inspections about the compliance of the implementation plan approved by the NRA, and reviews the application for alteration approval of the implementation plan that considering the progress of work.

3 Preparation of the report

This report describes the steps taken for implementing the obligations under this Convention and is a compilation of information available at the end of March 2014, unless otherwise specified.
Although taking the Guidelines on the structure of National Report (INFCIRC/604/Rev3) into account, this report has a slightly different structure to clearly identify the responsible organization for each obligation of the Joint Convention. This report was mainly developed by the following organizations and the Ministry of the Environment(MOE) provided reference information of off-site remediation.

Chapters defined by INFCIRC/604	Responsible organization
A	MOFA, MEXT, METI, NRA
B	METI
C	MOFA
D	NRA
E	MHLW, METI, NRA
F	NRA
G	NRA
H	NRA
I	METI
J	NRA
K	MEXT, METI, MOE, NRA
L	NRA

Section B Policies and Practices

Article 32

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.

Section B describes the national policy for promoting the spent fuel management and radioactive waste management in Japan and the operator's actions based on that policy. The policy and actions for the safety of spent fuel management and radioactive waste management are described in "Section G Safety of Spent Fuel Management" and "Section H Safety of Radioactive Waste Management", respectively.

B1 Spent Fuel Management Policy

How to manage spent fuel is a global challenge. Spent fuel is an unavoidable product of the use of nuclear energy, and it is essential to implement measures to resolve this challenge as a responsibility of the current generation so that the burden is not passed on to future generations. Therefore, Japan will drastically reinforce and comprehensively promote efforts to resolve the challenge of how to manage and dispose of spent fuel.

As the current generation that has produced radioactive waste, the government of Japan will reinforce measures toward final disposal of high-level radioactive waste and take the initiative in solving this problem. However, the process will take a long time. In the meantime, spent fuel produced by nuclear power generation must be safely managed. It is therefore necessary to expand the capacity for storing spent fuel and is urgently important to broaden the range of choices for managing spent fuel while ensuring safety. It will ensure flexibility of policies and response, and contribute to medium-term energy security.

In Japan's new Strategic Energy Plan (April, 2014 Cabinet decision), based on this concept, the storage capacity of spent fuel will be expanded. Specifically, while studying a wide range of locations as possible sites, regardless of whether they are inside or outside the premises of a power plant, the government of Japan will strengthen its effort for facilitating construction and utilization of new intermediate storage facilities and dry storage facilities.

Furthermore, the government of Japan will promote development of technologies for reducing the volume and harmfulness of radioactive waste in order to secure a wide range of options in the future.

Regarding the nuclear fuel cycle policy, the government of Japan will steadily promote reprocessing and plutonium use in Light Water Reactors (LWRs) while taking into consideration past history and will seek the understanding of the relevant municipalities and the international community, and it will flexibly address measures in the mid- to long-term basis.

The "Act for Deposit and Administration of Reserve Funds for Reprocessing of Spent Fuel from Nuclear Power Generation" (see Section E) was established that requires the operators to deposit the funds for spent fuel reprocessing in a fund administration corporation. The objective of "the Act" is to ensure the proper implementation of spent fuel reprocessing, disposal of radioactive wastes generated from reprocessing, and disassembling of reprocessing facilities. As a part of such steps, The Minister of METI designated "Radioactive Waste Management Funding and Research Center" (public interest incorporated foundation) as a non-profit "fund administration corporation" (October 2005) that is supervised by the Minister through supervisory orders and on-the-spot inspection.

B2 Spent Fuel Management Practices

1. Reprocessing of spent fuel generated from nuclear power generation

Electric utilities had sent spent fuel to the United Kingdom and French reprocessing companies since 1969; the export of spent fuel to foreign reprocessing plants closed in July 2001. Approximately 7,100MTU of spent fuel had been exported.

A part of national demand for reprocessing had been covered by the reprocessing plant of the incorporated administrative agency, JAEA, which was commissioned in December 1980, in Tokai village in Ibaraki Prefecture (reprocessing capacity: 0.7MTU per day). This plant was built for the purpose of establishing reprocessing technology and of training and fostering engineers and technicians in Japan. The plant completed the reprocessing service contracted by the electric utilities in the end of March 2006. Since then, it has been utilized as a facility for developing technologies for reprocessing spent MOX fuel in light water reactors (LWRs), spent fuel in an advanced thermal reactor and spent fuel in a fast breeder reactor. The plant has reprocessed a total of approximately 1,100MTU of spent fuel since the commissioning.

In response to the amendment of the Act on the Regulation of Nuclear Source Material, Nuclear Fuel Material and Reactors in 1979, a private reprocessing company, the Japan Atomic Fuel Service Co., Ltd. (presently, the Japan Nuclear Fuel Ltd., JNFL) was established in 1980, funded by the electric utilities. This company commenced construction of a commercial reprocessing plant with annual reprocessing capacity of 800MTU in Rokkasho village, Aomori Prefecture in 1993, based on the operating experience of the reprocessing plant of Japan Atomic Energy Agency (JAEA), considering the trends of domestic demand for reprocessing, and introducing technologies and experiences accumulated in the leading countries in the field of reprocessing. The reprocessing plant started pre-service inspection using actual spent fuel in 2006 aiming at commencement of operation in 2014. The plant has reprocessed a total of approximately 430MTU for the pre-service inspection at the end of March 2014. Spent fuel storage has already begun in a plant, completed in 1999, with the storage capacity of 3,000MTU. This plant has

accepted a total of approximately 3,400MTU by the end of March 2014. As of the end of March, 2014, the amount of spent fuel stored in nuclear power plants of LWR in Japan amounts to approximately 14,000MTU.

2. Offsite interim spent fuel storage

The amendment of the Act on the Regulation of Nuclear Source Material, Nuclear Fuel Material and Reactors was enforced in 2000 to incorporate provisions on interim spent fuel storage. In response to this amendment, Tokyo Electric Power Company and Japan Atomic Power Company jointly established "Recyclable-Fuel Storage Company (RFS)" in 2005. RFS applied to the Minister of METI for the license for the construction and operation of Recyclable-Fuel Storage Center at Mutsu city, Aomori Prefecture, which is Japan's first off-site interim spent fuel storage facility, in March 2007, based on the Act on the Regulation of Nuclear Source Material, Nuclear Fuel Material and Reactors. The application was accepted in May 2010. The application for the design and method of construction was made to the Minister of METI in June 2010, and was approved in August 2010. Upon receipt of the approval, the construction was started. The Recyclable-Fuel Storage Center is the facility to store spent fuel generated from BWRs and PWRs in metallic dry casks, and is capable of storing a maximum of approximately 3,000MTU of spent fuel.

In December 2013, Nuclear Regulation Authority (NRA) developed new regulatory requirements for nuclear fuel cycle facilities including spent fuel storage facility based on TEPCO's Fukushima Daiichi Nuclear Power Station Accident. In January 2014, RFS applied to NRA for review of spent fuel storage facility. Now NRA is implementing its review. RFS is scheduled to start operation in March 2015.

3. Management of spent fuel from research reactor facilities

The spent fuel from research reactor facilities is either returned to the USA, or is reprocessed or stored in Japan.

B3 Radioactive Waste Management Policy

The government of Japan developed the policy for promoting radioactive waste disposal as described below.

1. Radioactive waste subject to geological disposal

(1) High level radioactive waste

In Japan, a site for geological disposal of high level radioactive waste is determined through three steps of the selection of "preliminary investigation areas", "detailed investigation areas" and "construction site of final disposal facility", in accordance with the "Final Disposal Act" in May 2003. (See Section E). The Nuclear Waste Management Organization of Japan (NUMO) was established as an organization to implement final disposal. In addition, utilities have been deposited the reserve funds for final disposal to NUMO. The appeal to the public for candidate areas for literature survey on possible installation of final disposal facility was conducted by NUMO, but the literature survey has not yet been commenced.

Based on the failure of Toyo-cho, Kochi Prefecture, an additional system was introduced in 2007, in which central government offers a literature survey to the municipalities as well as research and development for the improvement of safety and reliability of geological disposal. Public hearings and PR activities for promoting public understanding have also been carried out. However, there is no record of the offer so far, and the literature surveys have not yet been undertaken.

Under these circumstances, in Japan's new Strategic Energy Plan (April 2014 Cabinet decision) it was decided that Japan should take the initiative to solve the problem of high-level radioactive waste as the responsibility of the current generation that created the waste so as not to put off the burden on to future generations. Specifically, central government focused on promoting peoples' understanding by indicating the area (scientific potential land) considered higher suitability from a scientific perspective. While making efforts on the assumption of geological disposal, it is ensured that the future generation will be able to select the best disposal method (reversibility and retrievability). The technical reliability of geological disposal will be evaluated while proceeding with parallel surveys and research of alternative disposal options.

As for international cooperation, Japan has been studying, and using as reference, cases in foreign countries where disposal site selection is in progress, and will continue to exchange views with the countries that have final disposal programs and also to promote multinational cooperation using cooperative frameworks of the IAEA, OECD/NEA, etc.

(2) Long-lived low-heat generating radioactive wastes (TRU wastes) to be geologically disposed of

ANRE amended the Final Disposal Act in 2007. According to this amendment, TRU wastes from reprocessing that need to be geologically disposed of and high level radioactive wastes that are returned from overseas reprocessing plants in exchange for TRU wastes were added to the wastes to be finally disposed of by NUMO, and generators of such radioactive wastes were legally requested to provide the cost needed for final disposal.

2. Radioactive wastes subject to disposal with active control

In Japan, disposal with active control is categorized by the following three types; "near surface trench disposal", "near surface pit disposal" and "intermediate depth disposal." JAEC stated in the Framework for Nuclear Energy Policy that it is often effective and efficient to manage and dispose of radioactive waste in an integrated fashion according to the properties of the waste material regardless of the generators or waste sources, and therefore, the Government should coordinate various systems accordingly.

Low level radioactive wastes generated in nuclear power plants that are subject to near surface trench disposal and near surface pit disposal are already being disposed of with such methods.

However, for intermediate depth disposal system, safety regulations have not been developed.

3. Ban on sea dumping of radioactive waste

In compliance with the Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter (1972) and its amendment to Annex I in 1993, it was decided that "the government of Japan will eliminate the option of sea dumping as a principle of low level radioactive waste in the future." Based on this decision, the Reactor Regulation Act was amended in May 2005, and sea dumping of radioactive waste was banned.

B4 Radioactive Waste Management Practices

Operators, recognizing their responsibility concerning radioactive waste management, shall manage radioactive waste generated at their facilities in compliance with The Reactor Regulation Act, the Radiation Disease Prevention Act and relevant regulations.

B4-1 High Level Radioactive Waste Management Practices

Spent fuel generated in Japan, has been reprocessed by the Rokkasho Reprocessing Plant of JNFL, Tokai Reprocessing Plant of JAEA and reprocessing plants in the United Kingdom and France. (JNFL has been reprocessed in active test and plans to complete the Rokkasho Reprocessing Plant in October 2014.)

The electric power utilities in Japan have concluded reprocessing contracts with the United Kingdom and French companies for a total of 5,600 MTU of spent fuel from light water reactors and 1,500 MTU of spent fuel from a gas cooled reactor. In accordance with these contracts, vitrified waste canisters are returned to the utilities and are stored in Vitrified Waste Storage Center of JNFL. As of the end of March 2014, 1,442 vitrified canisters had been returned from the United Kingdom and France. Return shipment of the 1,310 vitrified waste canisters from France started in 1995 and finished in 2007. Return shipment of the vitrified waste canisters from the United Kingdom started in 2010, and about 770 vitrified waste canisters will be returned in the next approximately five years. The Rokkasho Reprocessing Plant has been storing 346 vitrified waste canisters which were generated in active test.

High level liquid waste generated at the Tokai Reprocessing Plant of JAEA was stored in tanks within the facility and has been vitrified at the vitrification facility which started operation in January 1995. As of March 2014, about 415 cubic meters of liquid waste and 247 vitrified waste canisters are in storage.

Vitrified waste is decided to undergo geological disposal based on the final disposal method.

B4-2 Low Level Radioactive Waste Management Practices

For the business of waste based on the Reactor Regulation Law, please see chapter H.

B5 Criteria used to define and categorize radioactive waste

Classification of radioactive waste based on the Reactor Regulation Law is described in chapter E.

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 declared, pursuant to Article 3, Paragraph 1, of the Convention, that reprocessing is part of spent fuel management, when the government acceded to the Convention. Therefore the Government of Japan includes the spent fuel stored in reprocessing facilities in the scope of the Convention.

The Government of Japan did not make declarations provided for in Article 3, Paragraph 2 and 3, of the Convention.

Section D Inventories and Lists

Article 32

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.

D1 List of spent fuel management facilities

Spent fuel is being stored at spent fuel storage facilities within each nuclear power plant, the Tokai Reprocessing Plant of the Tokai Research and Development Center, JAEA Nuclear Fuel Cycle Engineering Laboratories, or the JNFL Rokkasho Reprocessing Plant and etc. Spent fuel is being stored at spent fuel storage facilities of each research reactor. The main locations, main purposes and characteristics of these spent fuel management facilities are listed in the Annexes.

D2 Storage of spent fuel

Inventory and types of spent fuel stored in the above-mentioned spent fuel management facilities are shown in the Annexes.

D3 List of radioactive waste management facilities

Radioactive waste management facilities within nuclear power plants include the following: waste treatment facilities; solid waste depositories where treated waste (homogeneous solidification, fill-up solidification, other than those solids), are stored; depositories where the replaced steam generators and other large solid wastes are stored; spent fuel pools where disused control rods and disused channel boxes are stored; and tanks where the spent ion exchange resin is stored.

Radioactive waste management facilities within enrichment and fuel manufacturing plants include the following: equipment to treat waste generated at the plants; and solid waste depositories where

treated waste is stored.

Radioactive waste management facilities within spent fuel reprocessing plants include: waste treatment equipment; waste depositories where vitrified waste and high level liquid waste are stored; and waste depositories where low level liquid waste and low level solid waste are stored.

Radioactive waste management facilities licensed under the waste interim storage or disposal business regulation include the following: radioactive waste disposal facilities; waste storage facilities for materials held prior to disposal; and waste treatment facilities.

Radioactive waste management facilities within research reactors and major nuclear material include the following facilities: waste treatment equipment for low-level radioactive waste generated at the plants; and solid waste storage depositories for treated waste.

Major radioactive waste management facilities licensed under the Act concerning Prevention from Radiation Hazards due to Radioisotopes, etc. include storage facilities for processed waste generated at radioisotope usage facilities.

Radioactive waste management facilities licensed under the Medical Care Act include storage facilities for processed radioactive medical waste generated from medical facilities.

The location, purpose and characteristics of such radioactive waste management facilities are listed in the Annexes.

D4 Inventories of radioactive waste

D4-1 Inventory of Radioactive Waste Being Held in Storage

The waste stored in the above-mentioned nuclear power plant storage facilities include ca. 700,000, 200-liter drums , 32 used steam generators in steam generator storage facilities, used control rods, disused channel boxes, spent ion exchange resin in spent fuel pools and other storage facilities, as of the end of March 2014. In addition rubble, trimmed trees, disused-protective clothing generated after accident, etc.[total 201,300m^3], and secondary waste from contaminated water treatment[848 cesium absorption apparatus and absorption vessel etc. and Sludge 597m^3] have been temporarily stored in TEPCO's Fukushima Daiichi NPS.

At facilities other than nuclear power plants, ca. 2,035 vitrified packages of HLW and ca. 415 m^3 of high level liquid waste are stored in spent fuel reprocessing facilities. Details of these inventories included the other radioactive waste are indicated in Section L.

D4-2 Inventory of Radioactive Waste That Has Been Disposed of

Since 1992, LLW stored at radioactive waste management facilities operated by commercial power reactors and that has a comparatively low concentration of radionuclides was transferred to a JNFL radioactive waste facility for disposal. The amount of waste currently at the disposal facility is listed in the Annexes.

The JNFL disposal facility is currently in operation and has disposed ca. 260,000 drums (200-liter-drum equivalent) of waste, as of the end of March 2014. At the JAEA Nuclear Science Research Institute's Tokai Research and Development Center, about 1,670 tons of very low level waste (concrete) resulting from the dismantling of the JPDR have been disposed of.

D4-3 Inventory of Radioactive Waste Resulting from Past Practices

None is produced under The Reactor Regulation Act.

D5 List and status of nuclear facilities in the process of being decommissioned

(1) Power reactors

As of the end of March 2014, nuclear power plants being decommissioned are JAPCO's Tokai NPS, the JAEA's Fugen Advanced Thermal Reactor, and units 1 and 2 at the Chubu Electric Power Company's Hamaoka NPS.

A reactor at JAPCO's Tokai NPS ceased operation in 1998. Decommissioning began in December 2001 with the dismantling of facilities and equipment such as the turbines, excluding the body of the reactor, and feed water pumps. The heat exchangers began to be dismantled in 2006. Dismantling of the reactor vessel will begin in FY2020 and will take around six years. Decommissioning is expected to be completed in FY2025.

The JAEA's Fugen Nuclear Power Plant Advanced Thermal Reactor ceased operation at the end of March 2003. The decommissioning application was filed in November 2006, approval was granted in February 2008 and the facility became the Fugen Decommissioning Engineering Center. Spent fuel is being transferred to the Tokai Reprocessing Plant, which is part of the Nuclear Fuel Cycle Engineering Laboratories at JAEA's Tokai Research and Development Center. Decommissioning will be completed by fiscal year 2033.

Units 1 and 2 at the Chubu Electric Power Company's Hamaoka NPS ceased operation in January 2009. The decommissioning plan, setting out both the basic decommissioning policy for units 1 and 2 and the activities in the first stage (dismantling preparation phase), was approved in November 2009. During the initial dismantling preparation phase, shipping of spent fuel, survey and investigation of contamination, decontamination of systems and dismantling of systems and equipment outside the controlled area will be carried out. Decommissioning is expected to be completed in FY2036.

TEPCO has decided to decommission units 1 to 4 at Fukushima Daiichi NPS, which were damaged by the March 2011 accident, and also units 5 and 6 at the same plant. These six units are in a state of permanent shutdown prior to receiving approval for the decommissioning plan prescribed in the Reactor Regulation Act.

(2) Research reactors

A total of 8 research reactors are in the process of being decommissioned: the JAEA's JRR-2, Reactor Facilities of the Nuclear Ship Mutsu, and Deuterium Criticality Assembly (DCA); Hitachi Ltd.'s Hitachi Training Reactor (HTR); Toshiba Corporation's Training Reactor-1 (TTR-1); the Rikkyo University Institute for Atomic Energy (RUR); the Tokyo City University (formerly the Musashi Institute of Technology) Research Reactor (MITRR); and the University of Tokyo Research Reactor (Yayoi).

D6 Usage facilities

Regarding facilities to which Article 41 of the Order for Enforcement of the Act on the Regulation of Nuclear Source Material, Nuclear Fuel Material and Reactors is not applicable, there are 197 facilities using nuclear fuel material and 18 facilities using nuclear source material.

Section E Legislative and Regulatory System

Article 18 Implementing Measures

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.

Article 19 Legislative and Regulatory Framework

1. Each Contracting Party shall establish and maintain a legislative and regulatory framework to govern the safety of spent fuel and radioactive waste management.
2. 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.

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

Article 20 Regulatory Body

1. Each Contracting Party shall establish or designate a regulatory body entrusted with the implementation of the legislative and regulatory framework referred to in Article 7, and provided with adequate authority, competence and financial and human resources to fulfil its assigned responsibilities.
2. 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.

Overview

As well as carrying out regulatory duties to ensure the safety of spent fuel and radioactive waste in accordance with the Act on the Regulation of Nuclear Source Material, Nuclear Fuel Material and Reactors, the NRA regulates sealed sources that are no longer in use, in accordance with the Act concerning Prevention from Radiation Hazards due to Radioisotopes, etc.. The NRA is a new

regulatory body established in September 2012 and the independence of its decision-making is guaranteed in law. Regulatory duties concerning spent fuel and radioactive waste that were previously overseen by the Nuclear and Industrial Safety Agency (NISA) and the Ministry of Education, Culture, Sports, Science and Technology (MEXT) have been integrated into the NRA. In March 2014, the Japan Nuclear Energy Safety Organization (JNES), a technical support organization, was also merged into the NRA.

E1 Legislation in Japan

In Japan's legal system relating to nuclear regulation, the Atomic Energy Basic Act is the most important piece of legislation and defines the basic principles of nuclear energy use. The Act on the Regulation of Nuclear Source Material, Nuclear Fuel Material and Reactors, which prescribes government regulations, and the Act for Establishment of the Nuclear Regulation Authority, which prescribes the competence of the regulatory authority, were enacted under this Act. Also, the law currently working for the promotion of spent fuel management is the "Act for Deposit and Administration of Reserve Funds for Reprocessing of Spent Fuel from Nuclear Power Generation" for securing the future costs for reprocessing in a safe, reliable and transparent manner. Meanwhile, the Final Disposal Act is applicable to taking necessary steps to systematically and securely carry out the final disposal of radioactive waste to be geologically disposed, such as vitrified waste of HLW generated from reprocessing of spent fuel. Other necessary legislation has been put in place such as the Act on Special Measures Concerning Nuclear Emergency Preparedness which stipulates responses to nuclear disasters.

These laws were amended on September 19, 2012, in response to the accident at TEPCO's Fukushima Daiichi NPS. The NRA subsequently compiled an NRA Ordinance, detailing standards for implementing nuclear regulations. The Act on the Regulation of Nuclear Source Material, Nuclear Fuel Material and Reactors prescribes such procedures as the permits, approvals, and inspections required for reactor construction and operation. It expressly grants the NRA authority to revoke permits and suspend the operation of facilities, and impose penalties for violations of its provisions.

(1) The Atomic Energy Basic Act

The 1955 Atomic Energy Basic Act forms the basis of nuclear energy use in Japan. The objective of the Act is to secure future nuclear energy resources use and promoting academic and industrial development, thereby contributing to the welfare of mankind and the enhancement of life. The Act specifically limits the research, development and utilization of nuclear energy to peaceful purposes, prioritizes safety, ensures that operations are performed independently under democratic management, and that relevant information shall be made public to contribute to international cooperation.

Moreover, the Act stipulates that the Atomic Energy Commission of Japan shall be established to ensure the democratic implementation of nuclear energy policy. Construction of reactors and the use of nuclear fuel materials will be governed by official regulations contained in the Act on the Regulation of Nuclear Source Material, Nuclear Fuel Material and Reactors.

The September 2012 revision carried out in response to the accident at TEPCO's Fukushima Daiichi NPS, included new provisions concerning the establishment of the NRA and the Nuclear Emergency Preparedness Commission. A provision concerning the establishment of the Nuclear Safety

Commission of Japan, which was abolished upon the establishment of the NRA, was deleted.

(2) The Act on the Regulation of Nuclear Source Material, Nuclear Fuel Material and Reactors (Reactor Regulation Act)

The 1957 Reactor Regulation Act governs all aspects of nuclear energy use in Japan.

Based on the Atomic Energy Basic Act, this Act limits the use of nuclear source material, nuclear fuel material, and reactors to peaceful purposes only. The Act seeks to prevent the release of radioactive material at abnormally high levels outside a plant or site, or any other disaster caused by nuclear materials or nuclear reactors. To ensure public safety, it seeks to protect nuclear materials by stipulating requisite regulations of the refining, processing, storage, reprocessing and disposal business and to address large scale natural disasters, terrorism or other criminal acts. It stipulates the regulation of International Controlled Material and the implementation of international conventions or other international commitments on nuclear use, research and development.

Regulations involving spent fuel interim storage and radioactive waste management prescribed in the Reactor Regulation Act establish procedures and standards for granting permits and approval, including operating permits, Approvals for Design and Construction Methods, Pre-service Inspections, Periodic Facility Inspections, Approvals for Operational Safety Programs, Operational Safety Inspections and decommissioning. The Act prescribes administrative penalties such as suspension of operations, revocation of permits and criminal penalties such as imprisonment or a fine should an operator fail to comply with the provisions of this Act. And radioactive waste management has three categories of the burial of Category 1 Waste Disposal, the burial of Category 2 Waste Disposal and Waste Interim Storage/treatment under the Reactor Regulation Act(Figure E1-1, Figure E1-2).

Furthermore, it establishes a system whereby employees and others working for nuclear operators, can report any violation of the Reactor Regulation Act to the NRA. It stipulates that those reporting violations via this system do not suffer any punishment.

The Reactor Regulation Act stipulates that it can be only partially applied when appropriate safety measures have been taken to ensure operational safety activities. Accordingly, the Ordinance Concerning the Operational Safety of Reactor Facilities at the Tokyo Electric Power Company's Fukushima Daiichi Nuclear Power Station and the Protection of Specified Nuclear Fuel Material has been enacted. This prescribes the steps to be taken to ensure safety at the Fukushima Daiichi NPS, where the situation differs from that at other reactor facilities.

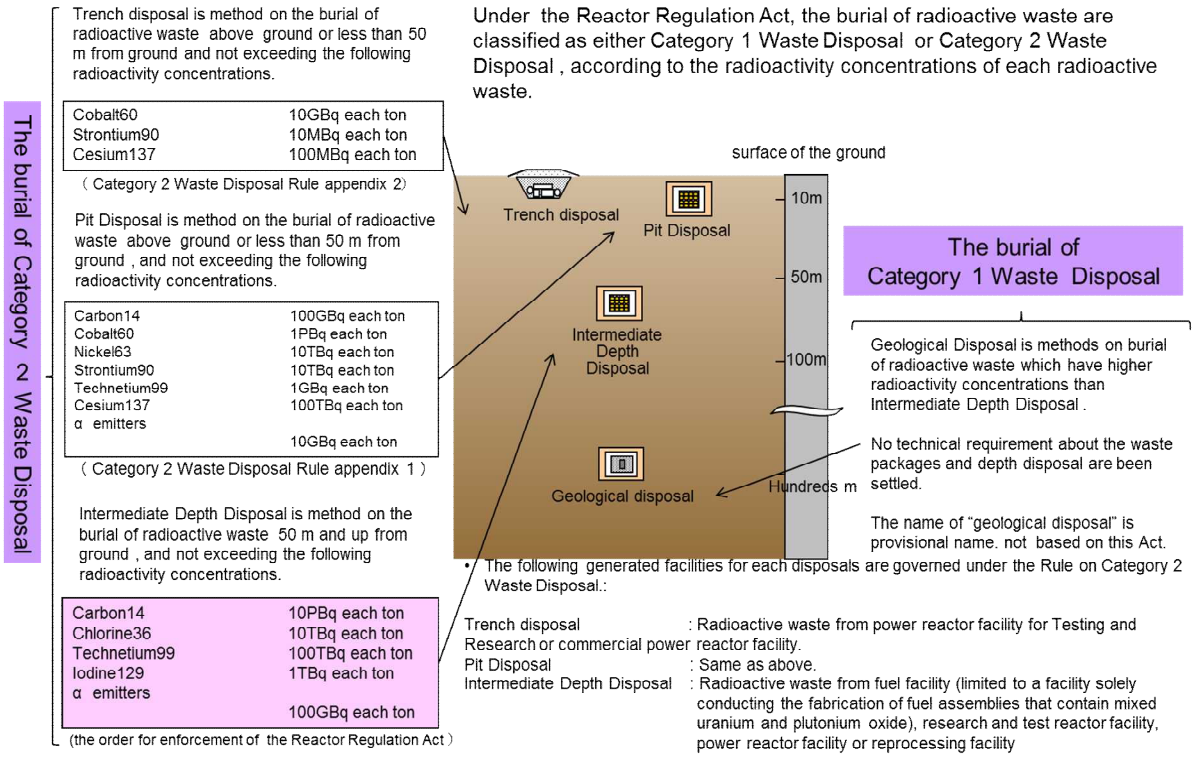
FigE1-1 Radioactive Waste Management prescribed in the Reactor Regulation Act

Radioactive Waste Management prescribed in the Reactor Regulation Act

Category	Radioactive Waste Management					
	The burial of Category 1 Waste Disposal	The burial of Category 2 Waste Disposal			Waste Interim Storage/treatment	
Name	NA※1	Intermediate Depth Disposal	Pit Disposal	Trench Disposal	Storage	Treatment
Contents	Final disposal by a method on the burial of radioactive waste in the excess of criteria defined by Order※2 as they have potential significant risks to human health.	Final disposal by a method on the burial of radioactive waste ※4 at a depth of 50 m and up from ground, and not exceeding criteria defined by Order※2.	Final disposal by a method on the burial of radioactive waste ※5 above ground or less than 50m from ground, and not exceeding criterea difined by the rule※3 (limited to methods either to fix radioactive waste at waste disposal site with the engineered barrier struture or fix integrally radioactive waste at waste disposal site without the engineered barrier site)	Final disposal by a method on the burial of radioactive waste ※5 above ground or less than 50m from ground, and not exceeding criterea difined by the rule※3 (excluding for methods either to fix radioactive waste at waste disposal site with the engineered barrier struture or fix integrally radioactive waste at waste disposal site without the engineered barrier site)	Storage of radioactive solid waste until final disposal is performed.	Processing radioactive liquid waste or radioactive solid waste to quality suitable for final disposal.

※1： The name of "geological disposal" is not based on the Reactor Regulation Act, but often used in order to distinguish other waste disposal
※2： The Order for Enforcement of the Act on the Regulation of Nuclear Sorce Material, Nuclear Fuel Material and Reactors
※3： The Rule on Category 2 Waste Disposal of Nuclear Fuel Material and Materials Contaminated with Nuclear Fuel Material
※4： Radioactive waste from fuel facility (limited to a facility solely conducting the fabrication of fuel assemblies that contain mixed uranium and plutonium oxide), research and test reactor facility, power reactor facility or reprocessing facility
※5： Radioactive waste from research and test reactor facility or power reactor facility.

Fig E1-2 Methods on the burial of radioactive waste for final disposal



(3) Final Disposal Act

The Final Disposal Act enacted in May 2000 provides for the following basic framework for systematically and securely carrying out the final disposal of high level radioactive wastes generated from spent fuel reprocessing (hereinafter referred to as "Designated Radioactive Wastes");

(i) development and public announcement of a basic policy and a plan (final disposal plan) for the final disposal of designated radioactive wastes by the Minister of METI
(ii) process for site selection for final disposal of designated radioactive wastes
(iii) securing of the expenses required for final disposal of designated radioactive wastes
(iv) implementing organization for final disposal of designated radioactive wastes.

The amendment of the Act in June 2007 newly added TRU wastes to be the subjects of geological disposal.

The Minister of METI establishes the basic policy and based on this, provides for the final disposal plan. NUMO, which was established as an implementing organization based on the final disposal plan, carries out final disposal activities. Utilities shall pay deposits to the fund reserved for disposal, which is managed by RWMC designated by the Minister of METI. NUMO promotes site selection by a three-step procedure, that is, selection of the preliminary investigation area, detailed investigation area and the construction site for final disposal facility; NUMO obtains approval of the Minister of METI at each step. The three-step procedure for site selection is clearly defined.

(4) Act for Deposit and Administration of Reserve Funds for Reprocessing of Spent Fuel from Nuclear Power Generation

This law provides for the framework of deposit etc., to reserve funds for reprocessing of spent fuel etc., from nuclear power generation. The fund is managed by an organization designated by the Minister of METI (Fund Management Organization). The Minister of METI, every fiscal year, notifies utilities of the amount of deposit based on the amount of electricity generated by nuclear fuel, and utilities deposit the amount in the Fund Management Organization. This law was enacted in October 2005.

(5) The Act concerning Prevention from Radiation Hazards due to Radioisotopes, etc. (Radiation Hazards Prevention Act)

The aim of the Radiation Hazards Prevention Act is as follows: "Based on the objectives of the Atomic Energy Basic Act, this Act seeks to prevent radiation hazards and ensure public safety by regulating the use, dealer, lessor, storage, disposal, and other handling of radioisotopes, the use of radiation generators, contaminated items and radioactivated items." The Order for Enforcement of the Radiation Hazards Prevention Act and the ordinance for enforcement thereof have been enacted under the Radiation Hazards Prevention Act. Permitted user involved in the use, storage or disposal of radioisotopes must undergo a facility inspection before use and further periodic inspections if they have larger than prescribed storage facilities or if they have a radiation generator. Before

handling radioisotopes they must prepare rules to prevent radiation hazards, appoint a radiation protection supervisor, and provide notification thereof. They shall comply with legal standards governing the use of facilities, measure doses within and at the boundary of their establishment as well as measuring the exposure dose of radiation workers, conduct education and training, and provide health examinations. When disposing of radioisotopes from an establishment handling radioisotopes or of items contaminated by such isotopes, users shall ensure that storage within the establishment in question or at the business establishment of a storage and disposal contractor complies with legal standards.

If necessary, NRA radiation inspectors conduct on-site inspections to check legal compliance standards. Users must notify the NRA when they cease to use radioisotopes or radiation generators and report any necessary subsequent measures., The basic framework for regulating the disposal of radioactive waste via burial by disposal contractors was put into place by the June 2004 revision of the Radiation Hazards Prevention Act and further revisions of the order for enforcement and ordinance for enforcement of this Act. Currently, public notices concerning the dose standards for disposal sites and other technical details to facilitate disposal via burial are being put into place.

Following the May 2010 revision of the Radiation Hazards Prevention Act, regulations were put into place covering the handling of items contaminated by radioisotopes but with a low radioactivity concentration. The revision established regulations covering the handling of contaminated items from radiation generators and strengthened measures to be taken when ceasing to use radioisotopes.

(6) The Act on Technical Standards for Prevention of Radiation Hazards

The objective of the Act on Technical Standards for Prevention of Radiation Hazards is to clarify the basic concepts for making technical standards at the standpoint of prevention radiation hazards, to establish the Radiation Council under the NRA so that technical standards can be reviewed with consistency in the Council.

(7) The Act on Special Measures Concerning Nuclear Emergency Preparedness (Nuclear Emergency Act)

In light of the specific nature of nuclear disasters, the 1999 Nuclear Emergency Act, together with the Reactor Regulation Act, the Basic Act on Disaster Control Measures and other laws, was designed to prevent nuclear disasters and protect the lives, health, and property of the general public. This Act prescribed the responsibilities of nuclear operators in preventing nuclear disasters, the issue of a Declaration of a Nuclear Emergency, the establishment of a Nuclear Emergency Response Headquarters and the implementation of emergency response and other special measures. Under this law, nuclear operators shall take all possible steps to prevent a nuclear disaster, avoid any escalation should such an event take place and then help to control and restore the situation to normalcy. It stipulates that the government take requisite emergency response measures, prevention and post-accident steps in such a disaster.

Following the TEPCO's Fukushima Daiichi NPS accident, the Nuclear Emergency Act was amended on September 19, 2012, including the enhancement of measures to prevent nuclear emergency, and the strengthening of the of the Nuclear Emergency Response Headquarters and other bodies.

（8） Medical Care Act

The management of radioisotope waste generated from radiopharmaceuti is conducted only by waste management facility operators designated by the Minister of MHLW on the basis of the Medical Care Act etc. Location, structures, and equipment of the waste management facility shall be complied with related technical criteria (standards) in order to be designated by the Minister of MHLW. They are conducted in accordance with these laws equivalent to the Radiation Hazards Prevention Act.

E2 Regulatory body

(1) The NRA's organization, authority, and responsibilities

The NRA regulates nuclear application in Japan, while the NRA Secretariat deals with related administrative matters. The NRA was established as an external bureau of the Ministry of the Environment. The Chairman and Commissioners of the NRA are appointed by the Prime Minister, with the consent of the Diet, in accordance with the provisions of the Act for Establishment of the Nuclear Regulation Authority, which aims for an independent, fair and neutral exercise of authority. The NRA provides the Diet with an annual report via the Prime Minister, of its activities. The appointment and dismissal of the NRA Secretariat personnel is at the discretion of the NRA Chairman. The NRA can establish rules in order to implement laws and cabinet orders under its jurisdiction. The term of office of the Chairman and Commissioners is five years, with reappointment possible. The duty of the NRA is to ensure the safe use of nuclear energy, so it has the right to grant permission for the establishment of reactor facilities.

The NRA can formulate rules governing nuclear regulations, including measures to ensure operational safety and the protection of specified nuclear fuel material, safety regulations, and emergency measures. The NRA approves the design and construction of facilities, inspections, approval of Operational Safety Programs and decommissioning plans. In addition, it collects licensee reports of nuclear facilities and conducts on-site inspections, if necessary.

It has the authority to revoke permits for nuclear facilities or suspend their operations, to order additional safety measures, the dismissal of reactor chief engineers, decommissioning measures and other steps to prevent disasters.

The NRA has under its auspices the Reactor Safety Examination Committee, which investigates the safety of nuclear reactors, the Nuclear Fuel Safety Examination Committee, which investigates the safety of nuclear fuel material, and the Radiation Council, which examines the technical standards for the prevention of radiation damage.

The NRA consists of the following departments: the Policy Planning and Coordination Division, which carries out general coordination within the Secretariat, as well as policy evaluation and Public Relations; the International Affairs Division, which liaises with international organizations and other countries; the Regulatory Standard and Research Division, which formulates standards and guidelines; four Divisions of Research (Reactor System Safety; Severe Accident; Nuclear Fuel Cycle and Radioactive Waste; and Earthquake and Tsunami), which conduct researches concerning nuclear safety technology; the Emergency Preparedness and Response Policies Division, responsible for developing emergency preparedness systems, providing an initial response in the event of an emergency, and physical protection of nuclear material; the Radiation Monitoring Division, which compiles summaries of nation-wide radiation monitoring; the Radiation Protection and Safeguards Division, which implements regulations on the use of radioisotopes and safeguards based on international commitments; the Nuclear Regulation Policy Planning Division, which puts into place systems for regulatory examination and inspections; and seven Divisions of Regulation (BWRs; PWRs and Inspections of Nuclear Reactor Facilities; Advanced Reactors, Research Reactors, Decommissioning; Nuclear Fuel (Fabrication and Reprocessing) Facilities and Use of Nuclear Material; Radioactive Waste, Storage and Transport; and Earthquake and Tsunami), which deal with the practical aspects of regulation based on the Reactor Regulation Act (Figure E2-1).

There are Nuclear Regulation Offices at 22 sites, with Operational Safety Inspectors and Nuclear Emergency Preparedness Officers permanently stationed at those offices.

In March 2014, the NRA merged with the Japan Nuclear Energy Safety Organization (JNES), to help increase its own expertise and strengthen its operating capabilities. Accordingly, at the end of March 2014, the NRA Secretariat had approximately 1,000 personnel, including the Operational Safety Inspectors and Nuclear Emergency Preparedness Officers stationed at nuclear sites.

(2) Ensuring NRA independence

The NRA's role is to conduct independent, neutral and fair nuclear regulation while ensuring a clear separation of nuclear promotion and regulation. The Chairman and Commissioners of the NRA are appointed by the Prime Minister with the consent of the Diet, and the Chairman appoints the NRA Secretariat staff. Therefore, government authorities tasked with promoting nuclear use have no interaction in the appointment or dismissal of staff.

The NRA's budgetary requirements are submitted to the Ministry of Finance and are funded from the national budget after being reviewed by the appropriate financial authorities and are deterimined based on the overall national financial situation. There is no financial involvement by other authorities tasked with promoting nuclear use.

The NRA has clear a clear mandate. It engages in independent regulatory decision-making stipulated in the Reactor Regulation Act in such areas as permits, approvals, and inspections. There is no interaction with other nuclear promoting authorities.

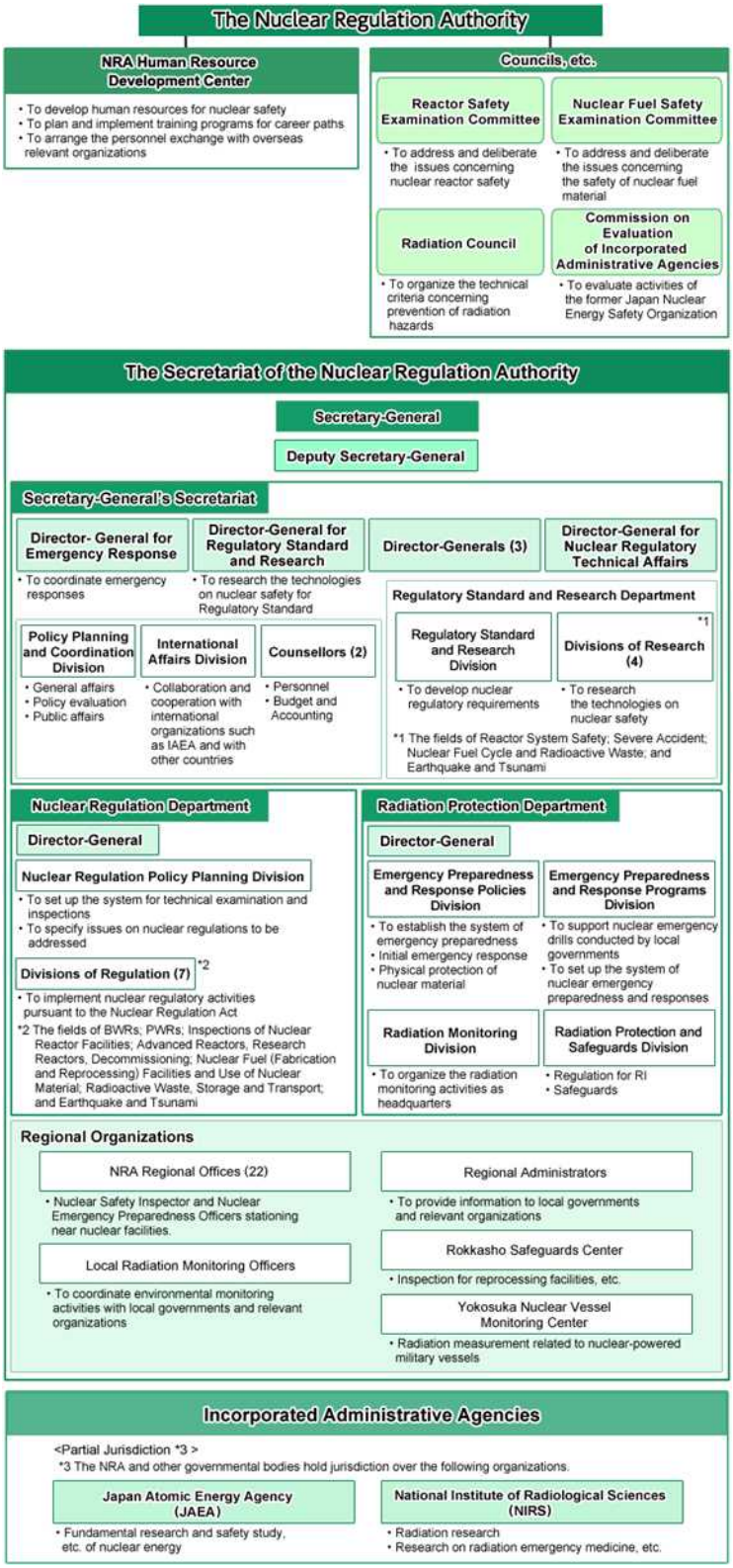
(3) Ministry of Health, Labour and Welfare (MHLW)

MHLW administer the safety regulations for radiopharmaceuticals, the regulations for the medical radiation, and the regulations for the structure and equipment of laboratories where radioisotopes are used for clinical *in vitro* examinations.

The Pharmaceutical and Food Safety Bureau (PFSB) regulates the production of radiopharmaceuticals based on the Regulations for Structures and Equipment's for Pharmacies, etc. and the Regulations for Manufacturing and Handling of Radio Pharmaceuticals under the Pharmaceutical Affairs Act. The Independent Administrative Agency, Pharmaceuticals and Medical Devices Agency, conducts periodic inspections of manufacturing plants that produce radiopharmaceuticals. And, PFSB also regulates storage and disposal of radiopharmaceutical-related-products. The Health Policy Bureau regulates structures and equipment's of hospitals and clinics where medical X-ray and/or radiopharmaceuticals are used, based on the Ordinance for Enforcement of the Medical Care Act. This ordinance also provides standards for the facilities of storage and disposal, etc. of radioisotopes which are used for clinical purposes.

Structures and equipment's of and laboratories where radioisotopes are used for clinical *in vitro* examinations are regulated by the Ordinance for Enforcement of the Clinical Laboratory Technicians, etc.Act, "Standards for Structures and Equipments of Clinical Laboratory equipped with Radioisotope for Specimen Inspection, Provided by Clinical Laboratory Technicians, etc.Act Enforcement Regulations Article 12, Paragraph 1. 5" (MHLW, Notification No.16, March 2, 1981). The ordinance, etc. indicates the standard for the storage or disposal of radioisotopes for laboratory test.

Fig. E2-1 NRA Organization Chart



Section F Other General Safety Provisions

F1 Responsibility of the license 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 license and shall take the appropriate steps to ensure that each such license holder meets its responsibility.
2. If there is no such license holder or other responsible party, the responsibility rests with the Contracting Party which has jurisdiction over the spent fuel or over the radioactive waste.

F1-1 Steps to ensure that each license holder meets its responsibility:

The Atomic Energy Basic Act establishes the most basic guidelines concerning the use of nuclear energy in Japan. This Act stipulates that "The research, development and utilization of nuclear energy shall be limited to peaceful purposes, aimed at ensuring safety and performed independently under democratic management. The results therefrom shall be made public to contribute to international cooperation." Based on this provision, licensees bear the primary responsibility to ensure the safe and peaceful use of nuclear energy.

Furthermore, the Atomic Energy Basic Act stipulates compliance with the regulations concerning nuclear fuel imposed by the government. In other words, licensees bear a responsibility to comply with regulations imposed by the government. Most of these regulations are set forth in the Reactor Regulation Act and the Act concerning Prevention from Radiation Hazards due to Radioisotopes, etc. (Radiation Hazards Prevention Act).

The Reactor Regulation Act explicitly states the legal responsibilities of licensees, stipulating that they "shall be responsible for installing equipment or apparatus contributing to the improvement of the safety of nuclear facilities, enhancing education on operational safety, or taking any other necessary measures for preventing disasters resulting from nuclear source material, nuclear fuel material, and reactors, while taking into account the latest knowledge on safety at nuclear facilities."

The regulations based on the Reactor Regulation Act prescribe the measures that licensees shall take to ensure operational safety, specifically measures concerning the operation and maintenance of facilities, and measures relating to transport, storage, and disposal. These measures are detailed in the NRA Ordinance pursuant to the Reactor Regulation Act.

In addition to establishing Operational Safety Programs and obtaining NRA approval, licensees shall also undergo NRA compliance inspections.

Licensees must stipulate in their Operational Safety Programs that they shall disclose noncompliance information in the event that such noncompliance results in the non-fulfillment of basic operational targets. Measures have been put in place to ensure that licensees do not conceal noncompliance.

Licensees are subject to penalties in the event of failure to meet their statutory responsibilities; this can be cited as an institutional mechanism for ensuring that licensees fulfill their responsibilities.

For example, in the event that a nuclear power reactor facility does not meet the technical standards prescribed in law or that its operation contravenes regulatory requirements, the NRA may require the licensee to adopt an operation method of the NRA's designation or order it to take any other measures deemed necessary, pursuant to the provisions of the Act. If the licensee of reactor operations violates this order, the NRA may revoke its permission or order it to suspend operation of the facility for a specified period not exceeding one year. In the event that an operator establishes a nuclear reactor without permission, it shall be sentenced to imprisonment with labor and/or a fine, pursuant to the provisions of the Act. The same shall apply if the licensee fails to obtain approval for its Operational Safety Programs or amends them without approval, or if a licensee and/or its employee(s) fails to comply with those Operational Safety Programs.

F1-2 Steps in the event that there is no licensee or other responsible party:[1]

In the event of revocation of a license, if there is no successor to the operator through merger or inheritance stipulated by the Act, the current license holder shall continue to be regarded as the license holder and responsible for "record keeping," "protective measures," "Operational Safety Program," and "physical protection" as prescribed in the Reactor Regulation Act, and shall be subject to regulation. In the event of the dissolution of the business of the license holder, if there is no succession to the status of the operator through merger or inheritance stipulated by the Reactor Regulation Act, the liquidator or bankruptcy administrator shall be regarded as the license holder and responsible for "record keeping," "protective measures," "Operational Safety Program," and "physical protection" as prescribed in the Reactor Regulation Act, and shall be subject to regulation. In addition, the above-mentioned persons shall develop a decommissioning plan, have it approved by the NRA, carry out decommissioning, and obtain confirmation of the completion of decommissioning from the NRA.

The Radiation Hazards Prevention Act provides for situations in which the storage and disposal contractor licensed under said Act has been dissolved. In the event of succession of the business in this situation, the Act prescribes that once approval has been granted for the merger, the surviving corporation shall succeed to the status of the operator. If there is no succession of the business, the liquidator shall take appropriate measures for decommissioning, such as removal of contamination by radioisotopes.

As described above, provisions are in place to ensure that business succession does not create a situation in which no licensee exists and that the business in question is abolished if there is no business succession.

[1]Disposal contractors designated under the Medical Care Act that handle medical radiation sources may not be abolished or dissolved until the steps required for abolishing the disposal business have been completed in accordance with said Act.

F2 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.

Based on the Reactor Regulation Act, the regulatory body confirms operator's technical competence including adequacy of human resources for installing and operating the facility appropriately in the review process of the license application. The applicant has to verify that it has sufficient technical competence to carry out its activity.

As a prerequisite for carrying out activities, the Reactor Regulation Act requires licensees to appoint the following chief engineers from among their qualified employees, to supervise the safety of operation: a Chief Reactor Engineer for reactor operation, a Chief Engineer for Nuclear Fuel Material Handling for fabrication or reprocessing, a Chief Engineer for Spent Fuel Handling in the spent fuel storage facility, and a Chief Engineer for Radioactive Waste Handling for handling nuclear fuel materials and other radioactive waste in the disposal facility.

Furthermore, regarding education and training, the Reactor Regulation Act requires operators to stipulate in the Operational Safety Program their policy on implementing operational safety education, including the plan for its implementation, as well as the content of such education. The regulatory body confirms compliance with these requirements through its Operational Safety Inspection.

Moreover, an operator of a business licensed under the Radiation Hazards Prevention Act is required to select and appoint a qualified person as Chief Engineer for Radiation Protection to supervise the safety management in the handling of radioisotopes before commencing business. The operator is also required to specify in the "Rules for Preventing Radiation Hazards" matters related to the duties and organization of persons engaged in safety management and handling of radioisotopes, as well as matters related to the education and training required to prevent radiation hazards.

F2-1 Activities to secure human resource infrastructure

(1) Human resource development by the Secretariat of the NRA:

Nuclear regulation is an administrative field requiring highly professional and technical judgments, so it is imperative to recruit a sufficient number of highly trained professional personnel and continuously enhance their expertise.

To this end, the NRA has established and systematically implemented staff training programs to enhance the expertise of its existing staff. More specifically, it conducted (1) specialist training for its Operational Safety Inspectors and Nuclear Emergency Preparedness Officers who are required to hold legal qualifications concerning nuclear regulations, including revisions to the Reactor Regulation Act; and (2) practical training in inspections using mock-up facilities. In addition, to maintain and improve their knowledge of nuclear engineering, it conducted training using postgraduate-level textbooks. To raise awareness among all staff members, the NRA held staff lectures on matters such as quality control and the country's approach to crisis management.

The NRA dispatched three staff members to relevant graduate schools within Japan and also dispatched staff to overseas nuclear regulators, such as the Nuclear Regulatory Commission in the USA, the IAEA and other international organizations.

Between its establishment and May 7, 2014, the NRA hired 35 staff members with expert knowledge and experience, and 33 new graduates. In addition, it embarked on other initiatives aimed at securing additional personnel, including continuing to recruit staff with practical experience and seeking to diversify the methods used to hire new graduates.

On March 1, 2014, the NRA merged JNES – an organization providing the NRA with technical support – into the Secretariat of the NRA. It took this opportunity to fundamentally strengthen its human resource development functions with a view to increasing the expertise of NRA staff, by establishing an affiliated institution in the form of the NRA Human Resource Development Center.

Furthermore, the NRA has steadily implemented human resource development by systematizing training programs, promoting knowledge management and technical tradition based on medium to long-term policy under the fundamental Human Resource Development of NRA approved in 25th June, 2012.

(2) Measures to secure personnel for operation:

In granting the permits for businesses prescribed in the Reactor Regulation Act, the NRA checks that an applicant possesses the technical ability necessary to conduct said business. In the case of licensees of power reactor operations, licensees of fabricating or enrichment activity, and licensees of spent fuel reprocessing, the NRA checks that they have the technical capability to prevent the occurrence and escalation of severe accidents.

The Reactor Regulation Act stipulates that licensees must take the necessary steps to ensure operational safety, that they must set forth Operational Safety Programs before commencing the operation of a facility, and that they must obtain the approval of the NRA for these.

In terms of the steps that should be taken to ensure operational safety, there are regulatory requirements concerning the deployment of appropriate staff and the certification of technicians. For example, the Rules on Commercial Reactors stipulate that only those with the requisite knowledge shall operate a power reactor; that power reactors shall only be operated when the staff required for reactor operations are present; and that those with responsibility for reactor operation shall have the necessary knowledge, skills, and experience, conform to the criteria set out by the NRA, and undergo checks by the NRA, focused on the method used to determine whether or not they conform to the criteria in question. Moreover, they stipulate the checks to be carried out before the reactor is started-up, the checks required for reactor operation and the checks to be conducted after reactor shut-down, and require the operator to comply with these.

The Operational Safety Programs – for example, in the Rules on Commercial Reactors – prescribe matters relating to operational safety education for those who operate and manage reactor facilities.They stipulate what should be set out in the Operational Safety Programs, including the content of operational safety education and the policy on its implementation. Moreover, the quality assurance plans in the Operational Safety Programs are required to contain human resource provisions. These stipulate that the competences required for personnel involved in duties that affect nuclear safety shall be identified, with education, training, or other measures to be implemented in the event of any shortfall in competences, and that the effectiveness of education and training shall be evaluated.

Regarding Operational Safety Inspections, in the case of the Rules on Commercial Reactors for example, the NRA conducts inspections four times a year, focusing on the status of compliance with the Operational Safety Programs when engaged in acts of particular importance in ensuring safety. It also conducts checks to ensure that competence management and education and training are carried out appropriately.

As a prerequisite for carrying out activities, licensees must appoint staff with the relevant qualifications to chief engineer posts. Licensees of power reactor operation must appoint a Chief Reactor Engineer to supervise operational safety in reactor operation; licensees of fabricating or enrichment and licensees of reprocessing shall appoint a Chief Engineer for Nuclear Fuel Material Handling to supervise operational safety in the handling of nuclear fuel materials; licensees of storage activity must appoint a Chief Engineer for Spent Fuel Handling to supervise operational safety in the handling of spent fuel; and licensees of waste disposal activity shall appoint a Chief Engineer for Radioactive Waste Handling to supervise operational safety in the handling of nuclear fuel materials and other radioactive waste in disposal operations.

When implementing decommissioning, licensees of reactor operation must formulate Operational Safety Programs that are tailored to decommissioning and obtain the approval of the NRA. The provisions relating to human resources in these Operational Safety Programs employ the same system as those in the Operational Safety Programs for reactor operation, such as the requirement to stipulate matters relating to safety education for those carrying out decommissioning, and prescribing

competence management and similar matters in the quality assurance plan as well.

F2-2 Financial Resources

In the process of Permission for Establishment License of a nuclear facility except for nuclear fuel material use facility in accordance with the Reactor Regulation Act, the NRA confirms that the applicant possesses the necessary financial basis. As a prerequisite for application, the applicant has to submit a business plan that explains the financial base of the business and has to certify that it possesses said necessary financial basis.

F3 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.

F3-1 Regulatory Requirements on QA of Nuclear facilities:

Under the Reactor Regulation Act, one of the criteria for obtaining approval of construction plans for a nuclear facility is that the licensee's quality control methods and inspection systems comply with technical standards prescribed in the NRA Ordinance.

More specifically, this ordinance requires that a quality control supervision system incorporating mechanisms for activities to foster a safety culture be established for the design and construction of nuclear facilities; that the responsibility of management executives be clearly stated; and that management of human and other resources, planning and implementation of specific duties, measurement, analysis, and continuous improvement be carried out.

Moreover, in terms of operational safety activities at nuclear facilities, licensees are required to establish a quality assurance plan in their operational safety programs, and must make continuous improvements to this plan, as well as planning, implementing, evaluating, and improving operational safety activities in accordance with the plan.

For example, in the Rules on Commercial Reactors, systems for implementing quality assurance must be operated by the senior management of licensees; have clearly identified responsibilities, authority, and duties in relation to quality assurance; and feature mechanisms for the formulation, implementation, evaluation, and continuous improvement of quality assurance plans.

Plans for operational safety activities are required to establish appropriate management methods in the event of external procurement of goods or services, procedures for the appropriate management of documents and records concerning operational safety activities, and systems for education and training for those involved in operational safety activities.

It is necessary to clarify individual goals and requirements during operational safety activities, and to check at appropriate times that these are being carried out in accordance with the implementation plan. To check this, licensees of reactor operation shall conduct the requisite inspections and tests, and establish an effective system to deal with any cases of noncompliance.

To evaluate operational safety activities, licensees must systematically conduct required monitoring and measuring of the current state of safety activities. Systematic auditing should be carried out to secure the implementation of appropriate safety activities and such auditing should be carried out by persons not directly involved in the items under review.

Licensees should establish procedures for ensuring the continuous improvement of operational safety activities and instituting preventive measures to avoid noncompliance situations that could occur or, should one occur, for introducing remedial measures to prevent a recurrence. Preventive

knowledge gained both from operational safety activities at their own power reactor facilities and from other facilities should be evaluated and, where appropriate, incorporated by licensees into their own operations.

F3-2 Initiatives by licensees:

Based on the private-sector quality assurance standard for ensuring safety at nuclear power stations (JEAC 4111-2009) and the Rule on Technical Standards for Quality Control Methods Concerning Design and Construction and for Inspection Organizations, which prescribes the regulatory requirements at the design and construction stage for each type of nuclear facility, licensees establish quality control supervision systems and conduct quality assurance activities, as well as ensuring that the effectiveness of these is maintained to meet the regulatory requirements mentioned above. NISA, which was the regulatory authority at the time that it was issued, approved JEAC 4111-2009 as being technically appropriate to serve as a standard for specifications meeting the regulatory requirements for performance standards for all nuclear facilities other than research reactors and usage facilities. JEAC 4111-2009 reflects not only the results of the review of IAEA Safety Standards Series No. GS-R-3, "The Management System for Facilities and Activities", which was issued in August 2006, but also points of reference from Safety Guide No. GS-G-3.1 Application of the Management System for Facilities and Activities. These technical standards and regulations also establish specific requirements for a quality management system, including "responsibility of top executives," "operational management of resources," "planning and implementation of duties," and "evaluation and improvement."

The human resource requirements stipulate that staff involved in duties that affect nuclear safety must be competent in terms of education, training, skills, and experience.

Licensees must identify the competences required and, if necessary, provide education and training to ensure personnel reach the necessary standard.

Licensees should conduct procurement procedures having clearly identified the requirements for products approval procedures, processes, and equipment; personnel competence checks; and quality management supervision systems. Moreover, the standard stipulates that procured items must be inspected on the premises of the supplier, if necessary, to ensure that they meet set standards.

Concerning the operation of nuclear facilities, quality assurance programs are audited. To guarantee its impartiality, an audit should be conducted by a department or external auditor capable of providing an objective appraisal. The auditing department should be directly under the responsible executive officer in the company's organizational structure, so that the officer in question can be quickly informed of any situation needing remedial action or improvement. In procurement management, it is common for licensees to conduct audits of suppliers directly, to ensure that the suppliers satisfy the specification sheet requirements.

In the case of products, the specification sheet detailing the requirements is given to the supplier at the time of ordering, and the product is checked when it is delivered in order to ensure that it meets

the requirements. If checks are required during the product manufacturing process, licensees can directly check that process. In the case of services, the specification sheet is given to the service provider in advance, to ensure that a person with the requisite skills is recruited. These include checking to confirm that the provider has technicians with the required specific skills, e.g. welding. On the issue of outsourcing, the provider must submit to the licensee a quality assurance plan, which the licensee checks to ensure that it meets all requirements.

This prevents sub-standard outsourcing to providers with inappropriate quality assurance systems.

This provides licensees with the confidence that quality assurance systems constitute one of the major elements for maintaining their own quality assurance systems. Accordingly, mechanisms to enable licensees themselves to conduct audits of providers and suppliers are being developed.

F4 Operational radiation protection

Article 24

1. 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.
2. Each Contracting Party shall take appropriate steps to ensure that discharges shall be limited:
   (1) to keep exposure to radiation as low as reasonably achievable, economic and social factors being taken into account; and
   (2) 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.
3. 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.

F4-1 Regulations on Radiation Protection:

Measures for radiation protection in a nuclear facility are outlined in laws such as the Reactor Regulation Act and its secondary legislation.

Radiation protection standards comply with the recommendations of the International Commission on Radiological Protection (ICRP) and have been incorporated into legislation. The Radiation Council ensures consistency between relevant pieces of radiation hazards legislation.

The NRA Ordinance prescribes the legislative requirements of radiation protection. These include measures controlling the exposure of radiation workers, and the monitoring of radioactive material released as part of the management of gaseous or liquid waste.

Moreover, the NRA Ordinance stipulates that in the event of certain problems, licensees shall immediately report to the NRA and submit within ten days a situation report and details of measures taken. These include incidents when gaseous radioactive waste is released through disposal facilities and lead to concentration limits in the air outside the Surrounding Monitored Area being breached, or when liquid radioactive waste is released through drainage facilities and the concentration limits in water outside the boundary of the Surrounding Monitored Area are breached.

The Notification to Establish Dose Limits in Accordance with the Provisions of the NRA Ordinance (Notification on Doses) prescribes in quantitative terms the dose limits and radioactive material concentration limits within Radiation Controlled Areas, dose limits and radioactive material concentration limits outside the Surrounding Monitored Area, dose limits for radiation workers and dose limits relating to emergency work.

To comply with these guidelines, licensees shall include the following provisions in their Operational Safety Programs: matters relating to operational safety education and radiation protection; the establishment of Radiation Controlled Areas, Conservation Areas, and Surrounding Monitored Area and access control, exhaust gas and effluent monitoring equipment; the monitoring of doses, dose equivalent, radioactive material concentrations, and the surface density of radioactive material of contaminated items and their decontamination; and the management of radiation detectors. Compliance with such matters is included in the Operational Safety Programs and is checked by Operational Safety Inspectors during periodic NRA inspections.

In addition, the NRA Ordinance requires licensees to submit reports for each business establishment, detailing the doses received by radiation workers over the course of the year.

Japan's radiation protection standard complies with the ICRP's 1990 Recommendations (Publication 60). This revision incorporates the ICRP Recommendations in principle, but also contains additional consideration of the following matters:

・The standard for the boundary of Radiation Controlled Areas has been set at 1.3 mSv per three months, based on the special limit for the public (5 mSv per year).

・The limit for female radiation workers has been set at 5 mSv per three months, this shorter period reflecting the need for better protection of a fetus before any pregnancy has been recognized.

・Dose limit for emergency workers is 100 mSv.[After the accident at TEPCO's Fukushima Daiichi NPS, based on the 2007 Recommendations of the International Commission on Radiological Protection (ICRP), dose limit changed remains at 250 mSv temporary from March 2011 to December 2011.]

Table F4-1 shows the dose limits for radiation workers and the general public prescribed in ordinances based on the Reactor Regulation Act and in the Notification on Doses. .

Table F4-1 Occupational Dose Limits

		Dose Limits
A	Radiation workers	
(1)	Effective dose limit	100 mSv/5 years and 50 mSv/year
(2)	female workers	As prescribed in (1), plus 5 mSv/3 months
(3)	Pregnant workers	As prescribed in (1), plus 1 mSv/user for internal exposure from the time the pregnancy is recognized until childbirth
(4)	Equivalent dose limit for the lens of the eye	150 mSv/year
(5)	Equivalent dose limit for the skin	500 mSv/year
(6)	Equivalent dose limit for the abdominal surface in pregnant workers	2 mSv/user from the time the pregnancy is recognized until childbirth
B	Radiation workers involved in emergency work	
(1)	Effective dose limit	100 mSv
(2)	Equivalent dose limit for the lens of the eye	300 v
(3)	Equivalent dose limit for the skin	1 Sv

F4-2 Numerical Guide to Reduce Dose to the Public in the Vicinity and Discharge Control:

In accordance with the provisions of the NRA Ordinance, licensees reduce the concentration of radioactive materials in gaseous waste as far as possible by such means as filtration in an exhaust gas facility, radioactive decay, or dilution, and then measure and monitor its release.

In the case of liquid waste, they reduce the concentration of radioactive materials as far as possible by filtration in a drainage facility, evaporation, adsorption using the ion exchange resin method, radioactive decay, or dilution, and then measure and monitor its release.

Licensees outline measures in their own Operational Safety Programs to control the release of gaseous and liquid waste in such a way as to ensure that the legally-prescribed radioactive material concentration limits outside the Surrounding Monitored Area are not exceeded.

To ensure that release levels are below the legal limits outside the Surrounding Monitored Area, licensees prescribe release control targets equal to the annual release quantity stipulated at the time they received their installation permit. In their Operational Safety Programs, they guarantee that they will not exceed those levels and the NRA checks the status of compliance when conducting Operational Safety Inspections.

Exhaust gas and effluent concentration limits are prescribed for the facilities of disposal businesses pursuant to the Radiation Hazards Prevention Act, ensuring that the dose at the boundary of the business establishment does not exceed 250 micro Sv/3 months.

F4-3 Environmental Radiation Monitoring:

To evaluate the impact of radioactive materials released from nuclear facilities on the surrounding environment, licensees monitor air radiation dose rates at the monitoring station and measure radioactivities in environmental samples so that facility is well managed. To protect the health and safety of the public in nearby communities, local governments in prefectures where reactor facilities are located also conduct local radiation monitoring.

After the accident at TEPCO's Fukushima Daiichi NPS, the government developed a Comprehensive Radiation Monitoring Plan (approved in August 2011, revised in March and April 2012, April 2013 and April 2014), governing environmental radiation monitoring work related to the Fukushima Daiichi NPS accident.

Points and frequency of environmental radiation monitoring was increased after the accident, and relevant ministries and bodies, including the government of Fukushima Prefecture, are now working in partnership to conduct meticulous monitoring in accordance with the Comprehensive Radiation Monitoring Plan.

Environmental radiation monitoring are available on the NRA website.

F4-4 Measures Taken to Prevent Unplanned and Uncontrolled Releases of Radioactive Materials into the Environment:

The above-mentioned rules prescribe that the three-month-averaged concentration of radioactive materials in air outside the Surrounding Monitored Area shall not exceed the concentration limits for discharge of gaseous radioactive waste, that the three-month-averaged concentration of radioactive materials in water outside the boundary of the Surrounding Monitored Area shall not exceed the concentration limits for discharge of liquid radioactive waste by a discharge facility, and that doses due to liquid discharge of radioactive waste from reprocessing facilities monitored at the outlet to the ocean shall not exceed the dose limit for three months. The rules also stipulate that licensees shall immediately report to the NRA when any of these limits are exceeded, and report within 10 days on details of the event and corrective measures taken.

F4-5 Measures to Mitigate the Effects of an Unplanned or Uncontrolled Release of Radioactive Materials into the Environment:

Licensees stipulate in their Operational Safety Programs the measures to be taken in the event of an emergency; these include the steps to be taken in the event of an unplanned or uncontrolled release of radioactive materials into the environment, to control the release and mitigate its effects.

For example, the Safety Examination Guide for Reprocessing Facilities, which is used in safety examination of reprocessing facilities with a large inventory of radioactive materials, stipulates that fire and explosion due to fine metal particles from fuel cladding or organic solvent, criticality accidents, leakage or loss of function due to damage or failure of equipment or piping, or spent fuel

handling failure must not subject the public to the risk of excessive radiation exposure.

If an unplanned or an uncontrolled release of radioactive materials from a nuclear facility triggers a specific event prescribed in the Nuclear Emergency Act, emergency activities will be initiated according to the procedure stipulated in accordance with the Nuclear Emergency Act. If the accident is serious enough, a Declaration of Nuclear Emergency is issued and emergency measures such as evacuation will be taken.

F5 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.

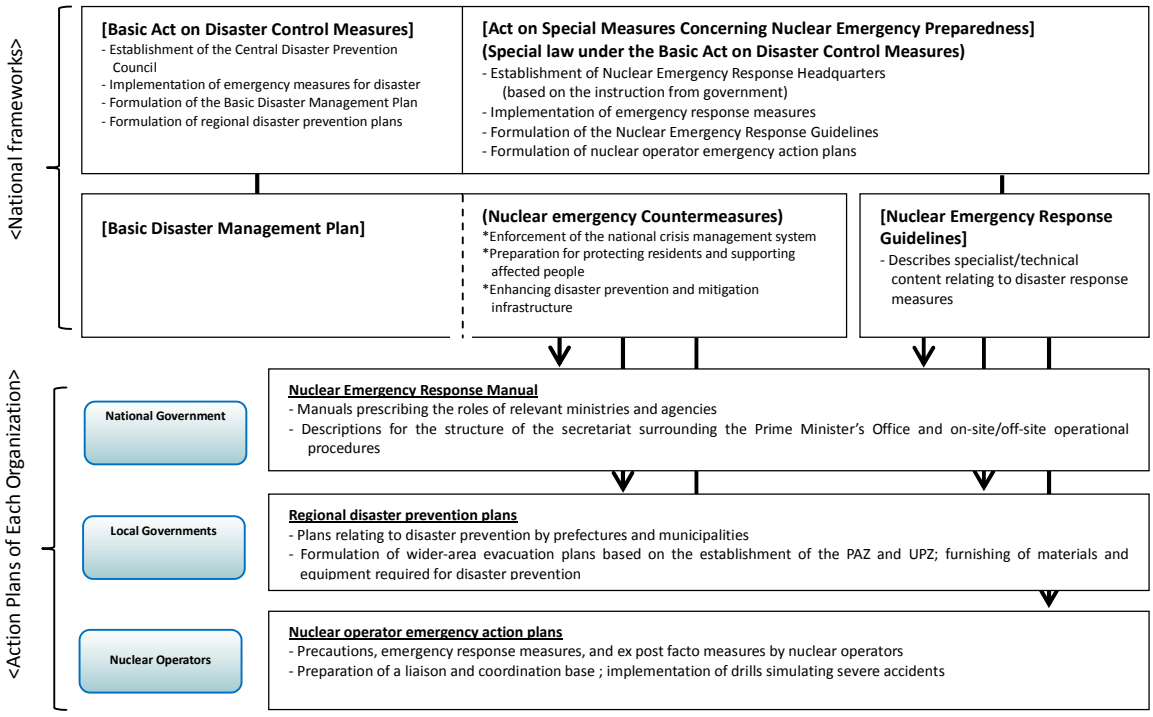
F5-1 Laws, Regulations and Requirements for Nuclear Emergency Preparedness

As stated in Section E, nuclear emergency responses in Japan are conducted on the basis of the Nuclear Emergency Act. The accident at TEPCO's Fukushima Daiichi NPS has been the catalyst for strengthening the nuclear emergency response system, such as establishing the new Nuclear Emergency Preparedness Commission within the Cabinet. Chaired by the Prime Minister, this will enable the government to promote measures to prevent future nuclear emergencies as part of its routine work, and failing that, to be prepared to deal with any crisis.

F5-1-1 Outline of the Laws and Regulations Concerning a Nuclear Emergency

Based on the experiences and lessons learned from the Fukushima Daiichi NPS accident, the government revised the Atomic Energy Basic Act, the Nuclear Emergency Act, and related legislation in September 2012 to develop new nuclear emergency responses. As a result of the revision of the Atomic Energy Basic Act, a Nuclear Emergency Preparedness Commission was established in the Cabinet to facilitate emergency preparedness measures even in normal operation. The Prime Minister serves as the Chairperson and the Chief Cabinet Secretary, the Minister of the Environment, and the NRA Chairman serve as Vice Chairpersons of the Commission. By the Revision of the Nuclear Emergency Act, measures to prevent nuclear disasters are enhanced and the functions of the Nuclear Emergency Response Headquarters are strengthened.

Emergency measures are taken under the Basic Plan on Disaster Prevention which is drawn up in accordance with the Basic Act on Disaster Control Measures and the Nuclear Emergency Act, and under the Nuclear Emergency Response Guidelines which are formulated in accordance with the Nuclear Emergency Act. The former prescribes the division of roles and responsibilities between nuclear operators, the national government and local governments, while the latter stipulates the specialized and technical measures required to deal with a nuclear emergency (such as references for the extent of zoning and criteria used to make judgments in an emergency). The diagram below provides an outline of the relevant legal system.



(1) The Act on Special Measures Concerning Nuclear Emergency Preparedness (Nuclear Emergency Act):

In the event of an emergency, such as the release of a large amount of radioactive materials, a Nuclear Emergency Response Headquarters will be temporarily established within the government. Following the Fukushima Daiichi NPS accident, the Nuclear Emergency Act was amended and the Nuclear Emergency Response Headquarters was strengthened. The Prime Minister serves as Headquarters director, and the Chief Cabinet Secretary, Minister of the Environment, and the Chairman of the NRA as deputy directors-general, with all Ministers of State and the Deputy Chief Cabinet Secretary for Crisis Management serving as regular members. The NRA holds primary responsibility for technical and specialized on-site safety issues. Matters concerning the procurement of equipment and supplies required for nuclear facilities and all matters associated with off-site response are handled by the relevant ministries and agencies, according to the directions of the director (the Prime Minister).

The NRA formulates specialized and technical guidelines to implement emergency preparedness measures, emergency response and the restoration (hereinafter referred to as "Nuclear Emergency Response Guidelines").

The responsibility of nuclear operators outlined in the Nuclear Emergency Act is to take all possible steps to prevent a nuclear disaster, to prevent the escalation of nuclear disaster, and to rehabilitate any resultant damage. Operators must formulate a Nuclear Operator Emergency Preparedness Program, formally notify the Prime Minister and the NRA, and publish a synopsis. An on-site organization for nuclear emergency preparedness must be established at each nuclear site and

actions to either prevent a disaster or limit any escalation and these actions must be carried out in accordance with the Nuclear Operator Emergency Preparedness Program. Accordingly, nuclear operators must appoint Nuclear Operator Emergency Preparedness Personnel to the on-site emergency organization and notify the NRA, the governors of the local and neighboring prefectures, and the local mayor. The nuclear operator shall select a Nuclear Emergency Preparedness Manager to supervise the on-site emergency organization. The NRA, the governors of the local and neighboring prefectures, and the local mayor shall also be formally notified of the appointment or dismissal of a Nuclear Emergency Preparedness Manager. If a specified event prescribed in the Nuclear Emergency Act occurs, the Nuclear Emergency Preparedness Manager shall alert the above actors and the Prime Minister.

In addition, nuclear operators shall maintain radiation measurement equipment to provide notification of specified event. Instruments for radiation protection and emergency communications equipment required to enable the on-site emergency organization to undertake its activities must be permanently available and regularly inspected and maintained. Radiation measurement instruments must undergo NRA performance checks.

As part of their routine work, local governments formulate regional emergency preparedness plans based on the Basic Plan on Disaster Response and the Nuclear Emergency Response Guidelines, and are able to respond to any emergency.

The Prime Minister designates an off-site disaster response facility for each nuclear site (Off-site Center), at which a local nuclear emergency response headquarters is established to coordinate emergency response measures.

Government emergency exercises are carried out on the basis of a plan drawn up by the Prime Minister. Exercises conducted by nuclear operators are carried out on the basis of legislation, emergency response plans, or Nuclear Operator Emergency Preparedness Programs> Nuclear operators must report the results to the NRA, as well as publishing a synopsis.

(2) Basic Plan on Disaster Response:

The Central Disaster Response Council formulated a Basic Plan on Disaster Response based on the Basic Act on Disaster Control Measures and the Nuclear Emergency Act. The section on nuclear emergency response measures prescribes basic matters and the respective division of roles of nuclear operators, the national government and local authorities.

The Basic Plan on Disaster Response was revised in September 2012 following the Fukushima Daiichi NPS accident. The major revisions are as follows:

- The revisions prescribe the immediate dispatch of the NRA Chairman to the Official Residence of Prime Minister to strengthen the Official Residence's decision-making and information dissemination functions.
- A nuclear facilities rapid response center for emergency shall be established at the headquarters or other appropriate offices of the nuclear power company as the base for accident response measures,

and a local headquarters shall be established at an off-site center to take responsibility for ensuring residents' safety. Measures to be taken on-site and off-site are thus clarified:

- The revisions prescribe the implementation of practical exercises simulating complex disasters and severe accidents.
- The revisions prescribe close cooperation when multiple headquarters are established in the event of a complex disaster.

(3) Nuclear Emergency Response Guidelines:

In response to the accident at Fukushima Daiichi NPS, nuclear emergency preparedness measures for commercial power reactors were strengthened in the Nuclear Emergency Response Guidelines. These guidelines stipulate emergency preparedness and their implementing frameworks and the establishment of specific zones where such measures will be treated as a priority. The national government, relevant local governments and the nuclear operators plan deals with a nuclear disaster based on the Basic Plan on Disaster Response and the Nuclear Emergency Response Guidelines. (The Nuclear Emergency Response Guidelines are detailed in "3 Measures for Dealing with an Emergency" below.)

The main items indicated in the Nuclear Emergency Response Guidelines are as follows:

- Basic matters concerning nuclear emergency responses
  - Guideline objectives
  - Characteristics of nuclear disasters
  - Basic concept of radiation protection action
- Nuclear emergency preparedness measures
  - Establishment of EAL and OIL, which form the standards for decision-making in an emergency
  - Establishment of a PAZ (within 5km from the facility) and UPZ (within 30 km from the facility); these are the zones for which prior measures, such as preparations for evacuation, should be formulated
  - Advance preparations, such as information dissemination, emergency radiation monitoring, and a framework for radiation emergency medical assistance, as well as education and training
- Emergency response measures
  - Prompt emergency radiation monitoring
  - Prompt information dissemination for residents
  - Implementation of proper protective actions (sheltering, evacuation, medication with stable iodine agents), based on EAL and OIL
- Medium- to long-term measures in response to nuclear disasters
  - Long-term evaluation of radiation effects on human health and the environment
  - Implementation of decontamination measures to minimize effects

The Guidelines stipulate the following as matters for further consideration:

- Introduction of Plume Protection Planning Areas (PPA) and establishment of priority zones and

emergency response measures for facilities other than commercial reactors

・Responses to the accident at TEPCO's Fukushima Daiichi NPS

- Determination of approaches to the transition from an emergency exposure situation to an existing exposure situation and a planned exposure situation
- Determination of approaches to priority zones for nuclear emergency response measures peculiar to TEPCO's Fukushima Daiichi NPS based on risk assessment

・Establishment of a regular forum for sharing information with local residents

F5-2 Responsibilities of Relevant Organizations Involved in Nuclear Emergency Response

The national government, local governments, and nuclear operators prepare the following systems to prevent a nuclear disaster or respond if a nuclear emergency occurs.

(1)The National Government:

・In the Nuclear Emergency Response Headquarters, the NRA holds primary responsibility for technical and specialized matters associated with the safety of nuclear facilities (on-site), while matters relating to the procurement of equipment and supplies required to deal with the nuclear facilities and all matters associated with the response outside the facilities (off-site) are handled by the relevant ministries and agencies, based on the directions of the director (the Prime Minister).

・Nuclear Emergency Preparedness Officers stationed in regions where nuclear facilities are located provide guidance and advice to prevent a nuclear emergency, such as preparing Nuclear Operator Emergency Preparedness Programs and helping to carry out measures to prevent a disaster escalating.

・Off-site centers have been set up in areas hosting nuclear facilities, with essential equipment and facilities for communicating with the Prime Minister's Official Residence, the NRA Emergency Response Center, nuclear operators, and relevant local governments. The off-site centers are capable of monitoring environmental radiation levels and plant status. They are linked with monitoring posts located around the facilities so they can monitor the plant status and environmental radiation levels in real time. Emergency monitoring is led and organized by the national government.

・The national government supervises emergency environmental radiation monitoring and implements Comprehensive Nuclear Emergency Response Exercises by uniting efforts of local governments, nuclear operators, and local residents.

(2)Nuclear Operators:

・Nuclear operators must prepare a Nuclear Operator Emergency Preparedness Program after conducting discussions with local governments before operations begin and then formally notify the NRA. The following must be included in the Nuclear Operator Emergency Preparedness Program:

- The duties of the Nuclear Emergency Preparedness Manager

- The composition of the organizations for nuclear emergency preparedness at each emergency base
- The policy on implementing nuclear emergency response education for appropriate personnel
- Equipment needed for responding to any nuclear emergency, including maintenance and inspections
- Planning, implementation, evaluation and improvement of nuclear emergency response exercises
- Measures to be taken during specified events following the declaration or termination of a nuclear emergency

・Nuclear operators shall establish an on-site nuclear emergency preparedness organization and appoint a Nuclear Emergency Preparedness Manager.

・This Manager must notify the government and surrounding prefectures immediately following specified events.

・Nuclear operators shall install and maintain radiation measurement equipment, radiation protection equipment and emergency communications to undertake on-site emergency response activities.

(3)Local Governments:

・Local governments formulate and implement Regional Disaster Prevention Plans based on the Basic Plan on Disaster Prevention and the Nuclear Emergency Response Guidelines. The main points included in the Regional Disaster Prevention Plans are as follows:

- Multiplexing communication networks among emergency response centers to ensure reliable communication with the national government, local governments, and nuclear operators
- Preparation of facilities, materials and equipment and systems to enable local headquarters to continue activities even in the event of a severe accident; establishment of cooperation with the NRA, designated administrative organs, public agencies, and nuclear operators; and development of a system to carry out extensive and adaptable emergency radiation monitoring
- Preparation of precautionary protective actions (initial emergency evacuation) within the PAZ; formulation of extensive evacuation plans and with the national government ensuring effective instructions for evacuation and transportation of people who need support
- Development of systems regulating the shipment of water and food
- Ensuring a comprehensive traffic control system to transport people from prioritized areas such as PAZ
- Preparation of a system governing iodine tablets including their timely and proper distribution and administration; establishment of a radiation emergency medical assistance system; development and maintenance of systems to dispatch and accept radiation emergency medical teams
- Preparation of information systems in the event of a complex disaster

・Prefectures support and coordinate administrative duties by municipalities.

F5-3 Measures for Dealing with an Emergency

F5-3-1 Nuclear Emergency Preparedness Measures:

(1) Basic Approach to Nuclear Emergency Preparedness

In case of a nuclear emergency, appropriate measures to protect local residents and others against radiation exposure need to be taken to avoid deterministic effects and to reduce stochastic effects. In light of the rapid progress of the Fukushima Daiichi NPS accident, it is necessary to take protective measures such as evacuation even before the release of radioactive material. When radioactive materials are released, prompt implementation of protective actions is required according to the development of the radiological situation.

(2) The Establishment of EAL and OIL

To establish protective actions, it is necessary to establish emergency categories based on the plant status and exposure risk, to share recognition of an emergency situation among stakeholders. The NRA has deliberated on radiation exposure dose levels at which protective actions should be taken. To enable appropriate protective actions to be implemented in various emergency categories, it is necessary to establish operational criteria based on observations and values.

Specifically, it is necessary to stipulate Emergency Action Levels (EALs) which determine emergency categories. They are primarily used to implement preventive protective actions in the event of an emergency at nuclear facilities. Also, it is necessary to stipulate OILs, which are used to formulate protective actions particularly after radioactive release. They are prescribed in the form of measurements such as the radiation dose rate envisaged in case of an emergency.

The emergency categories are divided into three:

・Alert

In this phase, there are no radiation effects on the public nor any imminent risk, but caution is required because of the possibility of the occurrence of an ‘abnormal’ event. In the PAZ, the organizations which take protective measures, such as a local government, begin time consuming preparations of measures.

・Site Area Emergency

In this phase, it is necessary for local governments in the PAZ to put into place the main protective measures around a nuclear facility which may affect public safety. They include the evacuation of all local residents in the PAZ.

・General Emergency

This phase requires competent authorities such as a local government to implement full emergency protective actions to avoid deterministic effects or to reduce stochastic effects, due to the occurrence of an event which may affect public safety. In the PAZ, it is necessary to implement protective actions such as evacuation and distribution of KI tables to all residents. Same measures can be taken in the UPZ depending on the plant status.

Emergency Action Levels are established as guidance whether a specific situation corresponds to one of these emergency categories, based on the status of each layer of a facility's defense-in-depth equipment, the status of radioactive material confinement functions, and whether or not any external events have also occurred. Table 1 shows emergency categories relating to commercial reactor facilities and the details of current EALs.

Nuclear operators are required to consider establishing more detailed EALs specifically relecting conditions at each power reactor and submit them to the NRA which examines each facility's EAL and optimizes it if necessary.

Table 1 Emergency Categories and EALs

Emergency Category	EAL
Alert	If an earthquake with a magnitude of at least 6-minor on the Japanese seismic intensity scale has occurred in the prefecture in which a nuclear facility is sited If a major tsunami warning has been issued in the prefecture in which a nuclear facility is sited If a Tokai Earthquake Advisory has been issued: In the event of a crucial failure of the reactor facilities that a Director-General of the NRA Secretariat or the Director of the Accident Countermeasures Office of the Nuclear Emergency Preparedness Division deems to necessitate an alert In any other case in which the Chairman of the NRA deems the establishment of an NRA Nuclear Accident Alert Headquarters to be necessary
Site Area Emergency	Leakage of reactor coolant Failure of Emergency Core Cooling System in the High Pressure Coolant Injection system in the event of the loss of feedwater functions Loss of all feedwater functions to steam generators Loss of Residual Heat Removal functions in the event of the loss of heat removal functions from the reactor by means of the main condenser Station blackout (continuing for at least five minutes) If a situation in which only one power source is supplying electricity to the DC bus continues for at least five minutes, in the event that there is only one emergency DC bus Decline of the water level within the Reactor Pressure Vessel while the reactor is shut down to the level at which the Emergency Core Cooling System begins to actuate Loss of all functions for cooling the reactor during outage Unavailability of the reactor control room
General Emergency	Inability to shut-down the reactor, if required, by a conventional neutron absorber Loss of all functions to shut-down the reactor, if emergency shut-down is

	required Inability to inject water into the reactor in question using any of the Emergency Core Cooling Systems If the pressure within the Containment Vessel reaches the design-basis maximum pressure limit Loss of pressure control functions in the Containment Vessel, in the event that functions for removing residual heat from the reactor have been lost Loss of all functions for cooling the reactor Loss of all emergency DC power continues for at least five minutes Detection of radiation or temperature indicative of core meltdown Detection of a change in the liquid level within the reactor vessel or other phenomenon indicative of exposure of the irradiated fuel assemblies within the reactor vessel If a situation continues for at least one hour in which the water level declines to a point where residual heat removal functions are lost Unavailability of the reactor control room The liquid level in the irradiated fuel assembly storage tank declines to the level at which the fuel assemblies in question are exposed If a situation in which the ambient radiation dose rate at the site boundary reaches 5 micro Sv/hour continues for at least ten minutes

If the initial phase of an emergency reaches the General Emergency level, based on the EAL judged by the facility status, it may be necessary to begin protective actions such as precautionary evacuations to reduce exposure of the general public. There is a possibility that high air dose rates could be observed over a comparatively extensive area after radioactive release because of air dispersal.

Accordingly, it is necessary to conduct emergency radiation monitoring, to analyze the results based on the appropriate criteria, and to take any requisite protective actions. The Operational Intervention Levels using figures such as the air radiation dose rate and the concentration of radioactive materials in environmental samples are established. The following table 2 shows the content of OILs corresponding to each protective action.

Table 2 OILs and Protective actions

	Classification	Outline of Classification	Initial Figure	Outline of Protective actions
Emergency protective actions	OIL1	Criteria for advising local residents for evacuation or sheltering within a few hours or shelter, to prevent radiation effects	500 micro Sv/h (air radiation dose rate when measured 1 m above the ground)	Identification of zones and evacuation within a few hours (including

<table>
<tr><td></td><td></td><td>from surface soil, inhalation of re-suspended radioactive materials, or inadvertent oral ingestion</td><td colspan="3"></td><td>ordering those who cannot easily move to the sheltering temporarily)</td></tr>
<tr><td></td><td rowspan="2">OIL4</td><td rowspan="2">Criteria for conducting decontamination to prevent inadvertent oral ingestion and external exposure via skin contamination</td><td colspan="3">Beta rays: 40,000 cpm
(detector counting rate a few cm from the skin)</td><td rowspan="2">Screening evacuees based on evacuation standards and prompt decontamination of those exceeding the criteria</td></tr>
<tr><td colspan="3">Beta rays: 13,000 cpm
(detector counting rate a few cm from the skin)</td></tr>
<tr><td>Initial protective actions</td><td>OIL2</td><td>Criteria for restricting ingestion of local produce and advising local residents to temporarily relocate within a week or so, to prevent radiation effects from surface soil, inhalation of re-suspended radioactive materials, or inadvertent oral ingestion</td><td colspan="3">20 micro Sv/h
(air radiation dose rate when measured 1 m above the ground)</td><td>Identification of zones within a day or so and restriction of ingestion of local produce, as well as temporary relocation within a week or so</td></tr>
<tr><td rowspan="6">Restrictions on ingestion of food and drink</td><td>Screening criteria for food and drink (Response to OIL3)</td><td>Criteria for identifying areas where measurement of radionuclide concentrations in food and drink should be carried out in preparation for possible food and drink restrictions at OIL6</td><td colspan="3">0.5 micro SV/h
(air radiation dose rate when measured 1m above the ground)</td><td>Identification of zones where radionuclide concentrations in food and drink should be measured within a few days</td></tr>
<tr><td rowspan="5">OIL6</td><td rowspan="5">Criteria when restricting food and drink ingestion to prevent radiation exposure via oral ingestion</td><td>Nuclide</td><td>Drinking water, milk, dairy products</td><td>Vegetables, cereals, meat, eggs, fish, other</td><td rowspan="5">Analysis of radionuclide concentrations in food and drink, within a week, and prompt restrictions on food and drink intake if results are in excess of the criteria</td></tr>
<tr><td>Radioactive iodine</td><td>300 Bq/kg</td><td>2,000 Bq/kg</td></tr>
<tr><td>Radioactive cesium</td><td>200 Bq/kg</td><td>500 Bq/kg</td></tr>
<tr><td>Alpha-emitting nuclides of plutonium and transuranic elements</td><td>1 Bq/kg</td><td>10 Bq/kg</td></tr>
<tr><td>Uranium</td><td>20 Bq/kg</td><td>100 Bq/kg</td></tr>
</table>

(3) Medical Dependencies

In addition to medical assistance during a disaster, radiation emergency medical assistance may be required in a nuclear emergency. It is important that the medical care appropriate to address emergency situations is available to perform properly and promptly with consideration of exposure

doses, the extent of exposure consequence and possibility of contamination, and the need to conduct medical control for affected populations and disabled patients. Appropriate medical procedures should then be provided, with various medical institutions fulfilling their respective roles (emergency treatment, screening) taking into account the situation in each area. Effective systems and chains of command should be established as a routine measure in institutions dealing with emergencies and disasters. An issue particular to radiation medical assistance is the long-term and late effects of radiation exposure, so it is vital to develop a knowledge of these and ensure proficiency in relevant techniques.

From the foregoing perspective, the NRA incorporates medical dependencies during the nuclear disasters into the Nuclear Emergency Response Guidelines, together with education, training, and practice exercises for appropriate institutions, including the national and local governments.

Radioactive iodine/iodide is accumulated mainly in the thyroid gland and may cause thyroid cancer when deposited dose are relatively high. Accumulation of radioactive iodine in the thyroid can be reduced by the prior administration of KI tablets. The effectiveness of KI tablets is dependent on the time when tablets are given. The NRA has instructed that KI tablets should be dealt as conventional pharmaceuticals, namely in compliance with medical advice.

In the PAZ, because of the possibility of immediate evacuations in the general emergency, a system is being developed to enable local governments to distribute KI tablets to local residents in advance as a routine measure, ensuring maximum effectiveness.

F5-3-2 Emergency Response Measures:

(1) Basic Approach to Emergency Response Measures

In an emergency, taking the most effective and prompt protective actions is necessary to protect local residents. In such case, concerned personnel have to take appropriate protective actions based on the observable values.

(2) Identifying Abnormal Situations and Taking Emergency Response Measures:

Following the release or threat of abnormal levels of radioactive materials or radiation, the operator of a nuclear facility shall immediately determine the applicable emergency category based on available information and notify the national and local governments, proposing appropriate protective actions. The national and local governments shall take the following emergency response measures:

- If the situation has reached Alert or Site Area Emergency status, they shall begin protective actions in case it develops into a General Emergency, and provide information to local residents.
- If situation has reached General Emergency status, they will begin measures such as the evacuation of local residents from the PAZ, as a general rule, and from part of the UPZ, depending on the situation at the plant.
- Depending on the results of emergency environmental radiation monitoring, measures such as

evacuation, temporary relocation, and/or restrictions on food and drink intake shall be implemented outside the areas where precautionary protective actions have already been taken.

(3) Implementation of Emergency Environmental Radiation Monitoring:

a Preparation and initial response to emergency environmental radiation monitoring

The national and local governments, nuclear operators, and designated public organizations make preparations for emergency environmental radiation monitoring in an Alert status. In a Site Area Emergency, the national government establishes and begins operating an emergency environmental radiation monitoring center with the cooperation of local governments, and requests the necessary personnel based on a staff deployment plan, providing those staff with disaster information with which to begin monitoring.

b Establishment of an emergency environmental radiation monitoring implementation plan

The national government swiftly formulates an emergency environmental radiation monitoring implementation plan, taking into consideration such practical factors as the severity of the accident, residence zones and population distributions, topography, weather forecasts and the results of atmospheric dispersion predictions, and provides overall supervision of emergency environmental radiation monitoring in the various fields.

With the assistance of local governments, the nuclear operator, and relevant designated public organizations, the national government revises the emergency environmental radiation monitoring implementation plan as the situation evolves. If the damage prevents adequate emergency environmental radiation monitoring, the government will consider using weather forecasts and atmospheric dispersion prediction results as the basis for a monitoring system. Should prolonged or extensive emergency environmental radiation monitoring be required, the national government will respond in accordance with the staff deployment plan stipulated in advance.

c Implementation of emergency environmental radiation monitoring

The national and local governments, nuclear operators, and designated public organizations conduct emergency environmental radiation monitoring based on the emergency implementation plan under the supervision of the emergency environmental radiation monitoring center. Initial monitoring should focus on the measurement of air dose rates to determine future protective actions based on OILs. The aerial concentration of radioactive materials, mainly radioactive iodine, should also be measured. Measurement targets are to be expanded sequentially.

The origin of the accident among nuclear operators is responsible for the radiation monitoring, such as the concentration of radioactive materials discharged from the facility, and air dose rates at the boundary of the site. The operator shall report the results to the emergency environmental radiation monitoring center.

Depending on the severity of the situation, the emergency environmental radiation monitoring

center shall utilize available staff, materials and equipment, focusing on measurement targets to be prioritized.

d Results of emergency environmental radiation monitoring

The emergency environmental radiation monitoring center first judges the validity of the monitoring results, and the national government collects, analyzes and evaluates the verified results. These are utilized as a reference in determining future protective actions based on OILs. The national government takes weather data and atmospheric dispersion predictions into account when analyzing and evaluating the monitoring results and publicizes these results promptly in an easy-to-understand manner.

(4) Providing Information to Local Residents in an Emergency

The national and local governments shall make full use of all feasible means of communication, including diverse forms of media, in order to swiftly provide accurate, easily-understandable information to local residents. In doing so, they should repeatedly convey the following matters to local residents.

- The name of the affected facility, the time when it occurred, and details of the situation
- The state of the surrounding environment, such as measurements of air radiation dose rates, as well as future projections
- Action that local residents should take, broken down by zone or settlement

When the national or local governments disseminate information, they must seek the help of the media. In providing information, consideration must be given to those requiring assistance and those who are only staying in the area temporarily. Information should be shared with relevant organizations and efforts made to ensure there are no discrepancies in such information.

(5) Protective actions

When radioactive material or abnormal levels of radiation are released, or there is a risk of such an occurrence, the following protective actions shall be taken:

a Evacuation and temporary relocation

Urgent evacuation and temporary relocation should be carried out if local residents are exposed to unacceptable levels of radiation. Moving them reduces such risk. Evacuation is carried out urgently, to swiftly move people away from a location when the air dose rate there is high or could become so. Temporary relocation takes place in areas where the air dose rate is lower, with the aim of moving residents away from the area to reduce any unnecessary exposure that would result from remaining there. The contamination status of evacuation centers must be checked. Following screening, decontamination of evacuees may be necessary to reduce internal exposure and skin surface exposure. Evacuation and temporary relocation measures should be tailored to the Priority Zones for

Nuclear Emergency Response.

- In the PAZ, evacuation of all local residents must generally be carried out immediately when the situation reaches General Emergency status.
- In the UPZ, it is necessary to carry out a phased evacuation, depending on the situation at the nuclear facility. Emergency environmental radiation monitoring shall be conducted, with zones higher than OIL1 being identified and evacuated within the first few hours. Emergency environmental radiation monitoring shall be ongoing thereafter, and identification of and temporary relocation from zones higher than OIL2 must be carried out within a day.
- Outside the UPZ, areas higher than OIL1 and OIL2 must be identified following radioactive releases, in the same way as in the UPZ, and evacuation or temporary relocation must be carried out.

In implementing evacuation or temporary relocation as described above, the government's Nuclear Emergency Response Headquarters judges the necessity of evacuation and must clearly and without confusion convey its decisions to residents through appropriate local governments. The Nuclear Emergency Response Headquarters will consider transport methods and routes, and the securing of evacuation shelters, referring to emergency environmental radiation monitoring results obtained by the NRA, as well as weather predictions and the results of predicting atmospheric dispersion.

Special assistance must be given to residents, particularly those who need special help for physical or psychological reasons. Attention should be paid to coordinating evacuation centers in advance of an emergency and the possibility that these shelters may need to be relocated. Radiation protective actions must be included at evacuation centers such as hospitals, nursing homes and community centers which serve as temporary refuge centers for locals whose evacuation has been delayed or patients in hospitals and nursing homes.

b Sheltering

Sheltering is a relatively easy action to be taken by local residents, and helps to reduce radiation exposure and shield the body from neutron and gamma radiation. Residents should follow government advice to shelter indoors while awaiting orders. At hospitals and nursing homes it is sometimes necessary to prioritize the sheltering rather than the evacuation. In such situations, sheltering in a concrete building with a solid 'shielding' effect and air tightness is generally effective.

Practical sheltering measures are tailored to the Priority Zones for Nuclear Emergency Response.

- In the PAZ, evacuation is generally carried out in the event of a General Emergency, but sheltering is prioritized over evacuation.
- In the UPZ, sheltering must be implemented as a general rule, until phased evacuation or protective actions based on the OIL are carried out.
- Outside the UPZ, sheltering is generally implemented in the same way as within the UPZ. Accordingly, local residents must be warned that there is a possibility that temporary sheltering

might be necessary if the situation reaches General Emergency phase.

It is possible that the period of sheltering will be extended if a radioactive plume stays longer or comes one after another. In this case, a decision on evacuation can be made due to the loss of the exposure reduction effects by the inflow of contaminated air into the shelter, and because it is difficult to maintain normal life through longtime sheltering. In the case of sheltering inside the zones where residents should evacuate, aid supplies including medical care goods, and radiation protective actions for such remaining people should be considered, and necessary information be provided continuously to them.

In formulating Regional Disaster Prevention Plans (Nuclear Emergency Response Section), consideration must be given to ensuring that buildings fulfill stringent air-tightness conditions, and securing evacuation shelters and routes in case of a switch in evacuation plans. It is necessary to convey such information to the public during normal times.

c KI tablets prophylaxis

（*This section is quoted from the National Report of Japan for 6th Review Meeting concerning Convention on Nuclear Safety, August 2013*）

To prevent internal radioactive iodine exposure, KI tablets should be taken according to government directives. In addition to warnings about possible side-effects, the following points should be considered:

- KI tablets have no protective effect against any radionuclides other than radioactive iodine.
- It is necessary to take KI tablets in addition to other protective measures, such as evacuation, sheltering, and restrictions on food and drink intake. An excessive reliance on the effects of KI tablets, however, must be avoided and it is necessary to prevent inadvertent oral ingestion.
- When taking KI tablets, psychological anxiety could give rise to unusual reactions.
- Doses must be appropriate to the age of the patient. Particular care is required to avoid overdose in infants and young children.
- The following methods of administering KI tablets should be used, tailored to the Priority Zones for Nuclear Emergency Response.
- In the PAZ, the Nuclear Emergency Response Headquarters or local governments immediately issue instructions concerning evacuation and taking KI tablets when the situation reaches the General Emergency phase. However, persons unable to take KI tablets, as well as infants and young children (for whom the impact of thyroid gland exposure to radiation from radioactive iodine is greater) and their guardians should evacuate earlier upon the declaration of a Site Area Emergency,. In such circumstances taking KI tablets is unnecessary.
- When a situation reaches the General Emergency phase outside the PAZ, the NRA determines the necessity of taking KI tablets, in addition to possible evacuation and sheltering, after which the Nuclear Emergency Response Headquarters or local governments issue instructions. Residents are advised to take KI tablets in line with such instructions.

d Radiation emergency medical assistance

（*This section is quoted from the National Report of Japan for 6th Review Meeting concerning Convention on Nuclear Safety, August 2013*）

Medical procedures shall be carried out in accordance with the medical care system developed in advance, with a focus on affected patients or those exposed to radiation.

The NRA, which consolidates information from emergency environmental radiation monitoring, conveys information about radiation doses to key medical personnel coordinating care in affected areas via the Nuclear Emergency Response Headquarters. These medical personnel direct patients to the appropriate hospital and rescue services, and instruct these institutions to accept the incoming patients. Checks will take place to ensure that these patients have been accepted. People who are severely affected can be taken to an advanced medical facility. If radioactive iodine has been released or may be released shortly, responsible officials can direct that KI tablets are taken promptly by the general public, in accordance with government instructions. Decontamination, protection guidance and screening shall be carried out. If there is a strong possibility of internal exposure, it is necessary to carry out thyroid screening and internal exposure dose measurement.

e Contamination screening and decontamination

（*This section is quoted from the National Report of Japan for 6th Review Meeting concerning Convention on Nuclear Safety, August 2013*）

Screening to ascertain the degree of contamination is essential to curb internal exposure via inhalation and oral ingestion, reduce skin exposure, and prevent the spread of contamination, as well as ensuring that medical interventions can take place smoothly.

The place for contamination screening should be selected to ensure that all screening can be carried out (including the human body, objects, etc.) It is desirable for such screening to take place in a location where the radiation background is as low as possible.

It is necessary to conduct contamination screening of evacuees and those temporarily relocated at convenient centers and to carry out decontamination if the level is higher than the reference value.

(i) Body surface contamination screening

Body surface contamination screening shall be carried out primarily among evacuees. The OIL4 criteria shall determine decontamination. It is also desirable to carry out decontamination below OIL4 if possible, so guidance shall be provided on the requisite radiation protective actions.

If OIL4 is exceeded in body surface contamination screening at evacuation centers, simple decontamination (change of clothes, wiping of the skin, use of a simple decontamination agent or shower) shall be implemented, taking into account the effectiveness of such measures. Nasal smears should be taken to check contamination of the nasal cavity if there is concern about inhalation exposure. If the individual cannot be decontaminated there, they should undergo the procedure without delay upon returning home or reaching another suitable venue.

Medical personnel should wear two layers of gloves to prevent secondary contamination when

examining persons suffering body surface contamination.

It is desirable to explain the results of body surface contamination screening measures when carrying out protective actions such as decontamination.

(ii) Thyroid screening

Thyroid screening shall be carried out if concerns arise about radioactive iodine exposure following screening and emergency environmental radiation monitoring. However, it must be accepted that thyroid screening does not provide an accurate estimate of thyroid gland exposure dose.

Screening should initially be carried out using a simple measurement technique. If more detailed measurement is required, a thyroid monitor or whole body counter should be used, depending on the nuclide(s) involved. When making detailed estimates of internal exposure, it is necessary to utilize instruments capable of carrying out such detailed measurements.

(iii) Screening of goods

The screening of goods shall be carried out to curb external and/or internal exposure among those handling said goods and to prevent the spread of contamination. Moreover, OIL4 shall also be used in the screening of goods, with simple decontamination procedures being carried out on contaminated goods.

f Restrictions on food and drink

Restrictions on food and drink consumption are enforced when radionuclide concentrations rise above a certain level. These restrictions are designed to reduce internal exposure due to oral ingestion, but it is vital to provide alternative food and drink from outside the affected zone if necessary.

Practical restrictions on the consumption of food and drink should be implemented as follows:

- As well as identifying areas where the air radiation dose rate is higher than OIL2 and considering the step of temporary relocation, consumption of local produce must be restricted. Once the radionuclide concentrations in food and drink have been ascertained, possible restriction shall be determined on the basis of OIL6.
- Areas where air radiation dose rates are higher than the screening criteria for food and drink must be identified and measurement of radionuclide concentrations started. If these measurements confirm radionuclide concentrations in excess of OIL6, consumption of food or drink shall be restricted.

In implementing the aforementioned restrictions, the NRA must relay all relevant information to local governments via the Nuclear Emergency Response Headquarters. Local governments shall in turn inform residents.

F5-3-3 Medium- to Long-term Measures in Response to Nuclear Disasters:

(1) Basic Approach to Medium to Long-term Measures in Response to Nuclear Disasters

In response to a nuclear disaster, proper measures need to be taken with regard to radioactive materials discharged into the environment once the immediate crisis ends. It is therefore important to take medium to long-term measures described below as discussions continue.

(2) Environmental Radiation Monitoring to Promote Disaster Recovery

The national and local governments must conduct continuous environmental radiation monitoring to ascertain changes in radiation doses and concentrations of radioactive materials to enable the following disaster recovery decisions to be made.

- Revision of evacuation zones
- Determination of actions to control and reduce exposure doses
- Estimates of current and future exposure doses (estimation of individual radiation doses)

A system to integrate the collection, preservation, and utilization of data must be created to enable relevant organizations to efficiently use the information and ensure the validity of environmental radioactivity monitoring to be conducted on a medium to long-term basis.

(3) Estimation of Individual Radiation Doses to Promote Disaster Recovery

In addition to environmental radiation monitoring, national and local governments must estimate individual radiation doses assuming medium and long-term exposure to contamination and take appropriate measures.

Individual radiation doses vary according to a person's daily activities, so the results of behavioral surveys must be checked against those of environmental radiation monitoring. Actual measured values obtained through individual dose monitoring are also necessary. By combining these values, individual radiation doses can be estimated with higher accuracy.

(4) Health Assessment to Promote Disaster Recovery

Residents suffer not only radiation exposure but also mental and physical stresses of living in an abnormal environment during evacuation, sheltering and communal life over a long period of time. National and local governments must therefore conduct long-term health assessments including the mental health of residents in addition to monitoring diseases associated with radiation exposure. Through such health assessments, officials must eliminate public fear about present and future health problems.

(5) Decontamination Measures

Government officials must institute decontamination measures to enable residents to return to their normal lives as quickly as possible. Such measures must take relevant social factors into consideration.

Government organizations must encourage public participation by providing all decontamination information, guidance, materials, equipment and training, and by deploying specialized advisors.

The exposure of workers engaged in decontamination situations should be managed by relevant laws and regulations.

(6) The transition from an emergency exposure situation to an existing exposure situation and a planned exposure situation

An emergency exposure situation will evolve into an existing exposure situation, when the radioactive release falls to a contrable level and the radiation exposure due to residual radioactive materials is controllable below a certain level. However, even in the aftermath of an emergency, some areas may continue to experience both an emergency and existing exposure concurrently. The transition between the two is a major factor in judging such issues as lifting evacuation orders and other protective actions and should be carefully considered. Once an 'existing exposure situation' arises, measures should immediately be taken to transition to a 'planned exposure situation'.

F5-4 Nuclear Emergency Exercises

Previously, nuclear emergency exercises were carried out by the national and local governments and nuclear operators, to check the effectiveness of emergency response systems in accordance with the Nuclear Emergency Act. However, following the Fukushima Daiichi NPS accident, these exercises are under review. Future exercises must now incorporate lessons learned from the Fukushima Daiichi NPS accident, including the possibility of an unprecedented complex earthquake-tsunami-nuclear accident disaster, as well as incorporating more realistic evacuation exercises. Such exercises range from large-scale national government exercises to those carried out by nuclear operators within a single facility. The following provides an explanation of these.

F5-4-1 Exercises Drawn up by the National Government

Hitherto, local governments have drawn up nuclear emergency exercises. The national government provided support and coordination. Following the enactment of the Nuclear Emergency Act, for which the 1999 JCO criticality accident was the catalyst, the national government drew up plans and implemented independent exercises.

The Fukushima Daiichi NPS accident marked the first time that such a nuclear emergency had been declared in Japan, and the nuclear emergency response system, including the nuclear emergency exercises, was put to the test. Based on this experience, the NRA is now reviewing the disaster response system, as well as reviewing nuclear emergency exercises.

The key feature of the exercises is that they envisage severe accidents or complex disasters and are intended to test close collaboration between related ministries and agencies, through such aspects as evacuation of local citizens within the UPZ (within 30 km from the facility). These exercises will form the basis for subsequent revisions of various plans and manuals.

F5-4-2 Exercises Based on Plans Drawn up by Nuclear Operators

Nuclear operators conduct exercises approximately once a year, focusing on such aspects as establishment and operation of a response headquarters, notification and liaison, and emergency environmental radiation monitoring, in accordance with the Nuclear Operator Emergency Preparedness Program prescribed for each site. Exercises check the effectiveness of organizations implementing accident management. In addition, if a local government carries out a site exercise, the management of that site will also conduct a exercise at the same time.

F5-4-3 Exercises Drawn up by Local Governments

Even since the Fukushima Daiichi NPS accident, prefectures and municipalities have conducted the exercises stipulated in exercise plans in their Regional Disaster Prevention Plans.

These exercises simulate severe accidents and complex disasters, train participants without providing them with the scenarios in advance, and use map exercises to improve the judgment of participants.

F5-4-4 Participation in International Exercises

Japan is a Contracting Party to the Convention on Early Notification of a Nuclear Accident and the Convention on Assistance in the Case of a Nuclear Accident or Radiological Emergency. In order to ensure that, pursuant to the provisions of these conventions, notification is provided without fail in an emergency, Japan consistently participates in the ConvEx exercises organized by the IAEA.

F5-5Information to the Public and Neighboring Countries

F5-5-1 Measures for Providing Public Information

To enhance information dissemination of disaster response plans for the public, local residents participate in national and local government emergency exercises. Local authorities explain a disaster response plan to residents, who then simulate evacuations to actual refugee facilities, and radiation surveys are carried out.

The NISA launched its emergency information mailing service in July 2008 enabling people to register their mobile phone e-mail address in advance and promptly receive emergency information. This system was inherited by the NRA in September 2012 and is now called N-alert.

During a nuclear emergency, the media will provide information to local residents. Press briefings, covered in television and radio broadcasts, will be held as required at the local off-site disaster prevention centers and at the Emergency Response Center in Tokyo

Websites will also provide emergency information to the public.

F5-5-2 Providing Information to Neighboring Countries

Japan is an island nation and shares no land borders with its immediate neighbors. However, its geographical neighbors – China and South Korea – also have reactor facilities. Following the Fukushima Daiichi NPS accident, sharing information during a nuclear emergency became an

important issue for all neighboring countries and in August 2009, senior Japanese, Chinese and South Korean regulators met and agreed to share such emergency information. The three countries had earlier exchanged information as required, but Fukushima nuclear accident underlined the importance of closer cooperation, and talks are currently underway to achieve such an outcome.

At a meeting of senior Japanese, Chinese and South Korean regulators in November 2011, the three countries reached an agreement on a Nuclear Safety Cooperation Initiative, which includes improving the exchange of information, cooperating in response to severe accidents, and cooperating on disaster prevention and emergency responses.

F5-5-3 Response in the Event of a Nuclear Accident or Radiological Emergency in a Neighboring Country

To implement the provisions of the Convention on Early Notification of a Nuclear Accident and the Convention on Assistance in the Case of a Nuclear Accident or Radiological Emergency, Japan has designated the Ministry of Foreign Affairs as the National Warning Point (NWP) and National Competent Authority for an Emergency Abroad (NCA(A)) for the event of a nuclear accident or radiological emergency occurring outside the territory of Japan. In the event of a radiological emergency outside Japan, including in a neighboring country, the Ministry of Foreign Affairs will receive a notification and pass on the details without delay to the National Competent Authority for a Domestic Emergency (NCA(D)) and other relevant authorities, and any necessary action will be taken. Moreover, in relation to the Convention on Assistance in the Case of a Nuclear Accident or Radiological Emergency, the National Assistance Capabilities (NAC) of relevant organizations within Japan have been registered in RANET (the IAEA Response Assistance Network).

F6 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

F6-1 Human and financial resources

(1)Human Resources

Licensees clarify, in the Operational Safety Program, safety organizations, responsibility and roles in decommissioning processes, and planning and implementation of relevant safety education programs necessary for managers and workers including subcontractors.

The regulatory body confirms the observance of the above-mentioned Operational Safety Program by the inspection (Operational Safety Inspection).

(2) Financial Resources

Electric utilities have deposited funds for decommissioning of commercial power reactor facilities using the Dismantling Reserve Funds. (See Section B)

F6-2 Operational radiation protection

The regulations on radiation protection applied to operating nuclear facilities which are described in Article 24 (F4), are also applicable to nuclear facilities in the process of being decommissioned.

F6-3 Emergency preparedness

The regulations on emergency preparedness applied to operting nuclear facilities which are described in Article 25 (F5), are also applicable to nuclear facilities in the process of being decommissioned.

F6-4 Records of information important to decommissioning are kept.

The Reactor Regulation Act requires the retention of important records such as inspection and radiation control records even at decommissioning stage.

Other records specific to decommissioning such as equipment or systems being dismantled, the schedule and method of dismantling will be registered at the end of each dismantling process.

Thus the regulatory body will be able to officially confirm the completion of the decommissioning process.

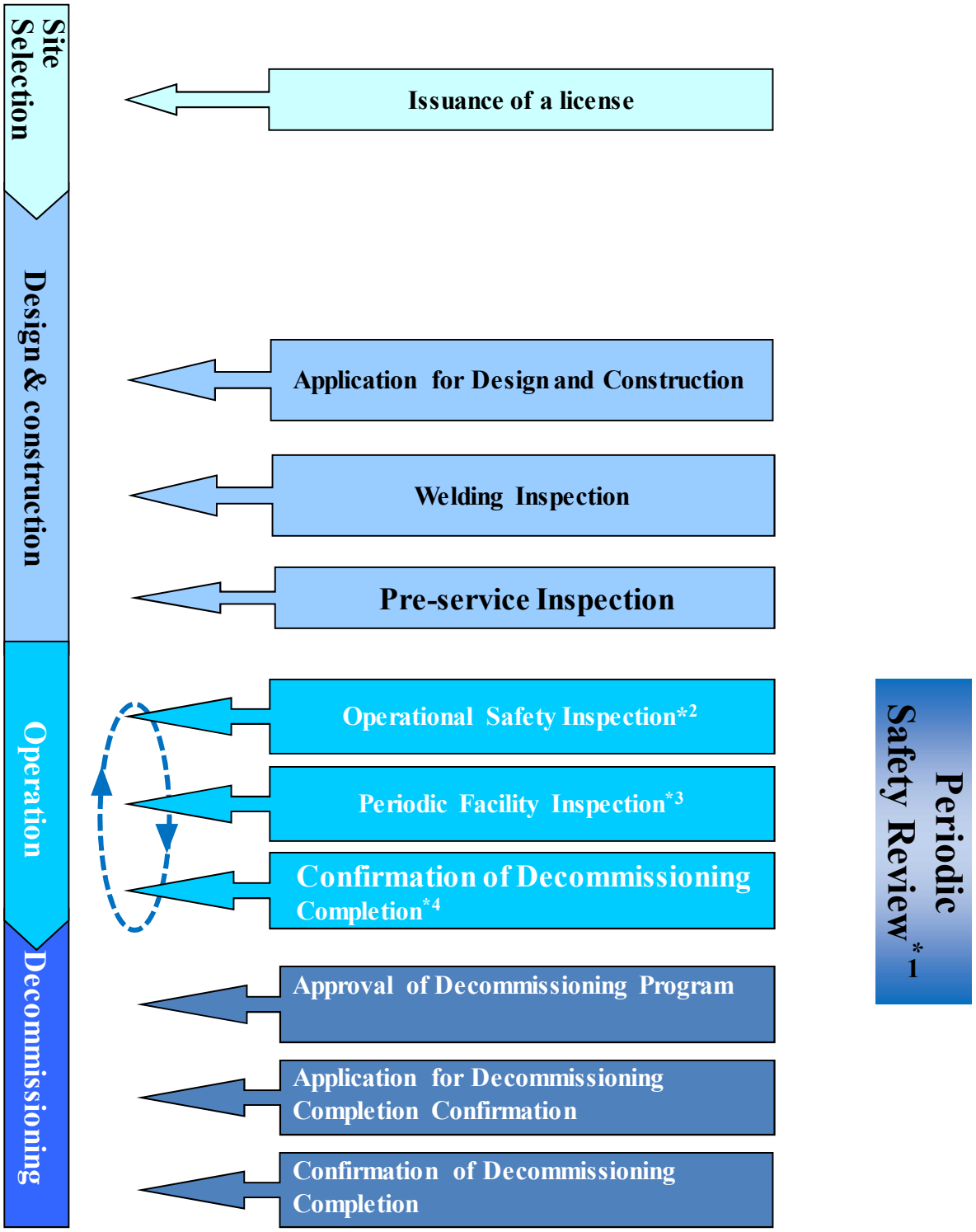
Section G Safety of Spent Fuel Management

This section focuses on the regulations concerning spent fuel storage activity provisions in the Reactor Regulation Act. These regulations were introduced in the 1999 revision of the Reactor Regulation Act and involve the storage of spent fuel outside reactor facilities before reprocessing.

The NRA formulated new regulatory requirements for nuclear fuel facilities, research reactors, and nuclear waste disposal and storage/treatment facilities, which entered into force in December 2013. In January 2014, the licensee applied for permission to modify the then current basic facility design to comply with new regulatory requirements and reviews to confirm that a new design complies with these requirements are being carried out by the NRA.

The regulation of interim storage activity is carried out in accordance with the Reactor Regulation Act and the Ordinance on Activity of Interim Storage of Spent Fuel (hereinafter referred to as the "Storage Ordinance" (Annex: Table G1-1)) stipulated by said Act. Figure G-1 shows the regulatory flow.

In response of the Fukushima Daiichi NPS accident, the NRA designated the complex as a Specified Nuclear Facility based on the provision of the Reactor Regulation Act of November 2012. TEPCO's Implementation Plan of the Measures for the Specified Reactor Facilities at Fukushima was approved by the NRA in August 2013. The spent fuel at Fukushima Daiichi NPS will be managed in accordance with this plan. The spent fuel assemblies currently stored in the reactor buildings will be transferred to the Common Pool at the storage site. Transfer of the spent fuel stored in the unit 4 reactor building was started in November 2013.



*1: (1) Assessment of the implementation status of operational safety activities and assessment of the application of the latest technical knowledge in operational safety activities: Every 10 years or less from the date of commencing business
(2) Technical assessment concerning aging degradation: Within 20 years of the date of commencing business and every 10 years or less thereafter
*2: Operational safety program compliance inspection: Conducted quarterly (4 times a year)
*3: Inspection to confirm that facility capabilities comply with the technical requirements: Conducted annually
*4: Physical protection program compliance inspection: Conducted regularly

Figure G-1 Regulatory Flow for the Interim Storage Activity

G1 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.

G1-1 Prevention of criticality and removal of decay heat

(1) Prevention of criticality

The NRA Ordinance on Standards for the Location, Structure, and Equipment of Spent Fuel Interim Storage Facilities (hereinafter referred to as the "Equipment Standards Ordinance[2]") and the Ordinance on Technical Standards for the Design and Construction Methods of Spent Fuel Interim Storage Facilities (hereinafter referred to as the "Storage Facility Design and Construction Ordinance[3]") prescribe that facilities shall have a criticality-safe geometry and observe other appropriate measures to prevent criticality of spent fuel.

(2) Removal of decay heat

The Equipment Standards Ordinance and the Storage Facility Design and Construction Ordinance prescribe that facilities must have a function of decay heat removal from the spent fuel.

G1-2 Minimization of radioactive waste

Although Japanese laws and regulations do not require that the quantity of radioactive waste be minimized, the spent fuel interim storage facilities currently under construction will handle waste in a sealed condition, thereby minimizing any resultant radioactive waste produced during operations.

2 See Annex: Table G1-2

3 Annex: Table G1-3

G1-3 Interdependencies between the different steps in spent fuel management

Spent fuel is generated in nuclear power plants and temporarily stored at a temporary facility at each site before transportation to a spent fuel interim storage or reprocessing facility. When the fuel has been stored at a spent fuel interim storage facility for a certain period, it is moved to a reprocessing facility.

The handling and storage of spent fuel in this process is governed by standardized and integrated regulations under the Reactor Regulation Act.

G1-4 Radiation protection based on international standards

Radiation protection related to spent fuel management is as described in F4.

G1-5 Biological, chemical and other hazards that may be associated with spent fuel management

The Reactor Regulation Act requires that spent fuel interim storage facilities shall take appropriate measures against potential events that may affect the facility, such as the leakage of radioactive material, fire, explosion, and earthquake.

G1-6 Consideration of any adverse effects for future generations

As described in G2, there is a mechanism for ensuring the appropriate management of the operation of spent fuel interim storage facilities and consideration is being given to measures to ensure that there is no increased risk in the future.

G1-7 Consideration of imposing undue burdens for future generations

As described in the previous section, consideration is being given to ensuring that any undue burden is not imposed on future generations. Separate legislation prescribes the securing of funds to cover the cost of spent fuel reprocessing. (See Section B)

G2 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.

G2-1 Reviews to enhance the safety of existing spent fuel management facilities

There was no licensee for spent fuel storage activities when this Convention took effect in Japan. Measures required to enhance the safety of spent fuel interim storage facilities are as follows:

(1)In accordance with the Reactor Regulation Act, the NRA conducts periodic inspections of the capabilities of spent fuel interim storage facilities and of their compliance with operational safety programs.

In addition, under the Reactor Regulation Act, licensees shall conduct: an annual inspection to confirm that their spent fuel interim storage facilities comply with technical standards; an assessment of the implementation status of operational safety activities and the implementation of the latest technical knowledge in operational safety activities every 10 years or less from the date of commencing business; a technical assessment of aging within 20 years of the date of commencing operations. Licensees must use those results to develop a 10-year plan to implement measures to preserve the integrity of said storage facilities.

(2) As described in K2, the Reactor Regulation Act was amended in 2012. This enabled the NRA to order licensees to meet revised regulatory requirements if a facility has become ‘non compliant’ – even if the complex in question had already been granted a license. In addition, licensees are required to ensure ongoing compliance even if future changes are made in maintenance standards.

G3 Siting of proposed facilities

Article 6

1. 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.
2. 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.

G3-1 Evaluation of site-related factors

The Reactor Regulation Act requires licensees to evaluate site-related factors and their impact onsafety, and when the effectiveness of these proposals has been confirmed, the NRA grants a license.

The criteria for the license described in the Reactor Regulation Act are that “the applicant has an adequate technical capability and financial basis to appropriately carry out the proposed activity; and the location, structure and systems of the proposed facility do not hinder prevention measures of any radiological disaster due to nuclear fuel materials or materials contaminated with nuclear fuel materials (spent fuel or materials contaminated with spent fuel, in the case of spent fuel interim storage facilities)”. The specific criteria concerning technical capability and the prevention of radiological disaster are stipulated in the Equipment Standards Ordinance and it’s interpretation and guidelines formulated by the former Nuclear Safety Commission of Japan (Examination Guide for Technical Competence of License Holders of Nuclear Power).

An applicant seeking a license for a spent fuel interim storage activities must include in their application descriptions of “the type and storage capacity of spent fuel to be stored”, “the location, structure and systems of the spent fuel interim storage facility and the storage method”, “the spent fuel facility construction plan”, and “the method for removing spent fuel after the termination of storage.” The document shall be accompanied by explanatory materials on “the conditions of meteorology, ground structure, hydrology, seismology, social environment at the site of the proposed spent fuel interim storage facility” and “the safety design of the spent fuel interim storage facility”. The applicant is required to use these to evaluate the site conditions and location of the spent fuel interim storage facility.

G3-2 Information disclosure for the general public

The NRA's policy for transparency is; to establish a comprehensive information disclosure system; to ensure open discussion; and to ensure administration based on written documents. Accordingly, the NRA publishes the agenda, minutes, and reference materials for its commission meetings, advisory committee meetings and study team meetings.

G3-3 Relations with neighboring contracting parties

Japan is an island nation with no land links with neighboring countries and has no legal system in place for consultations concerning the siting of nuclear installations. However, information on nuclear facilities can be provided within the scope of Japan's bilateral frameworks.

In particular, Japan, China and Korea have established a framework governing senior regulators meeting providing an opportunity for information exchanges.

G4 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.

G4-1 Radiological protection methods for construction and design of SF storage facility

Pursuant to the Reactor Regulation Act, the licensee shall submit an Application for Design and Construction Method before beginning construction of any licensed facility. The application must include evidence demonstrating that the design and construction methods comply with the technical standards set forth in the Storage Facility Design and Construction Ordinance. The NRA will give approval after confirming that the design and construction methods comply with the technical standards prescribed in the Reactor Regulation Act.

G4-2 Provisions for the decommissioning of a spent fuel management facility at the design stage

Procedures for the decommissioning of a spent fuel interim storage facility are prescribed in accordance with the Reactor Regulation Act. When decommissioning a facility, the licensee shall prepare a decommissioning plan and obtain NRA approval for it.

G4-3 Technologies incorporated in the design and construction of a spent fuel management facility

Under the Reactor Regulation Act, the licensee shall demonstrate compliance with technical standards in submitting an Application for Approval of the Design and Construction methods which will be approved by the NRA after it confirms compliance. There are prescribed technical standards for quality assurance methods focused on design, construction and inspection. These are based on the requirements contained in the Rules of Quality Assurance for Safety of Nuclear Power Plants (JEAC 4111-2009) issued by the Japan Electric Association and also take into account the requirements in relevant IAEA Safety Standard (Safety Requirement No. GS-R-3). Compliance with these standards is necessary for approval of design and construction methods.

Spent fuel interim storage facilities must also pass an NRA Pre-service Inspection before operations can begin. Approval will be granted if an inspector confirms that the construction has been carried out in accordance with the approved design and construction methods and that the facility's capabilities comply with the technical standards. Any welded areas in a spent fuel interim storage facility must pass a welding inspection to confirm it meets previously approved welding methods and technical standards.

G5 Assessment of the 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).

G5-1 Safety and environmental assessment of a spent fuel management facility be for construction

The procedures described in G3-1 and G4-1 ensure that safety and environmental assessments of a spent fuel interim storage facility are carried out before construction.

G5-2 Update of safety and environmental assessments of a spent fuel management facility

If a licensee wishes to modify the specifics of a facility for which a license has already been granted, even if the facility is not yet in use, they must follow the procedures prescribed in the Reactor Regulation Act to obtain permission for this modification.

G6 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 analyze 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.

G6-1 Permission to operate a spent fuel management facility

As described in G4-3.

G6-2 Operational limits and conditions

A licensee shall establish an Operational Safety Program in accordance with the Reactor Regulation Act and obtain the NRA's approval before starting operations. The Program shall specify the precise operational methods of the facility, maintenance checks, radiation monitoring, and quality assurance. Licensees shall stipulate specific limits in the Operational Safety Program, and must operate and maintain the facility in accordance with these. Licensees shall undergo quarterly NRA inspections (Operational Safety Inspections) to ensure compliance with their Operational Safety Program. If, the licensee's maintenance measures are found to violate Storage Ordinance or if the annual Periodic Facility Inspection reveals that a facility does not comply with the technical standards prescribed in the NRA Ordinance Prescribing Technical Standards for the Capabilities of Spent Fuel Interim Storage Facilities, the NRA may order the licensee to take the necessary steps to ensure operational safety. This may include suspension of operation, modification, repair, or compliance with a specified method of operating equipment. (Annex: Table G6-1 details the matters to be specified in the operational safety program)

G6-3 Operation, maintenance, monitoring, inspection and testing of a spent fuel management facility

During operations a licensee shall implement the necessary safety measures for “maintenance of a spent fuel interim storage facility”, “operation of a spent fuel interim storage facility “ and “transportation of spent fuel or transportation, storage and disposal of materials contaminated with spent fuel” in accordance with the provisions of the Reactor Regulation Act. There are legal provisions concerning operational safety measures in the following areas: “restrictions on access to controlled areas”, “measures concerning radiation dose”, “walkdown and inspection of spent fuel interim storage facilities”, “periodical self-inspection of spent fuel interim storage facilities”, “operation of spent fuel interim storage facilities”, “on-site transportation”, “on-site waste management”, and “Periodical Safety Review of spent fuel interim storage facilities”.

Operators shall establish an Operational Safety Program covering these matters and obtain NRA approval before starting operations.

In addition, as described in the previous section, licensees shall undergo periodic NRA Operational Safety Inspections to confirm compliance with their Operational Safety Program.

G6-4 Measures for ensuring that engineering and technical support in all safety-related fields is available during operation of a spent fuel management facility

When engineering or technical support is necessary to ensure the safety of a facility, licensees can, at their own discretion, receive support from academic societies and other private sector organizations and experts.

When a licensee outsources technical operational and management to a specialist contractor, it is vital that said contractor has the requisite capabilities to ensure a facility’s safety. Accordingly, licensees must closely monitor and manage contractors in accordance with their Operational Safety Program. The NRA checks their performance in this regard via Operational Safety Inspections and other measures.

G6-5 Timely licensee reports to the regulatory body on safety-related events

In the case of personal injury accidents (including incidents with the potential for personal injury) or a failure or other events at a nuclear installation, the licensee shall report this and other related matters to the NRA without delay, in accordance with the Reactor Regulation Act.

G6-6 Programs to collect and analyze relevant operating experience

In the case of a personal injury accident or a failure or other incidents, the licensee shall immediately report these to the NRA in accordance with the Reactor Regulation Act. The NRA will immediately publish the details and ascertain the licensee’s response. It will also publish details of the root cause and measures to be taken to prevent any recurrence once these have been determined.

After expert advice in operational management, inspections, and radiation controll, the NRA assesses the

cause of any accident or failure to identify safety lessons. If necessary, it requests licensees to implement measures to prevent a recurrence and/or reflects these lessons in its own regulatory activities.

G6-7 Development and revision of decommissioning plans for spent fuel management facilities based on the information during operation

A licensee planning to halt activities shall implement the necessary decommissioning measures, such as dismantling the spent fuel interim storage facility, decontamination, and disposal of contaminated spent fuel materials, in accordance with the Reactor Regulation Act. To this end, licensees must establish a decommissioning plan and obtain NRA approval.

The criteria for approving a decommissioning plan are that all spent fuel has been removed from the spent fuel interim storage facility; materials contaminated with spent fuel are appropriately managed, treated, and disposed of; and a decommissioning plan is appropriate to prevent hazards arising from materials contaminated with spent fuel. Information obtained during a facility's operation should be used for the management and disposal of contaminated material and for hazard prevention. In addition, to allow revision of the program as necessary, procedure of the Approval for Modification of Decommissioning Plan has been prescribed in the Reactor Regulation Act.

Section H Safety of Radioactive Waste Management

This section focuses primarily on provisions in the Reactor Regulation Act concerning radioactive waste storage/treatment and disposal.

The burial of radioactive waste is classified as either Category 1 Waste Disposal or Category 2 Waste Disposal, in accordance with the Reactor Regulation Act. It is governed by the Ordinance on Activity of Category 1 Waste Disposal of Nuclear Fuel Material and Materials Contaminated by Nuclear Fuel Material (hereinafter referred to as the "Category 1 Waste Disposal Ordinance") and the Ordinance on Activity of Category 2 Waste Disposal of Nuclear Fuel Material and Materials Contaminated by Nuclear Fuel Material (hereinafter referred to as the "Category 2 Waste Disposal Ordinance" (Annex: Table H1-1)), respectively, under this Act. Figure H-1 shows the regulatory flow for Category 1 and Category 2 Waste Disposal.

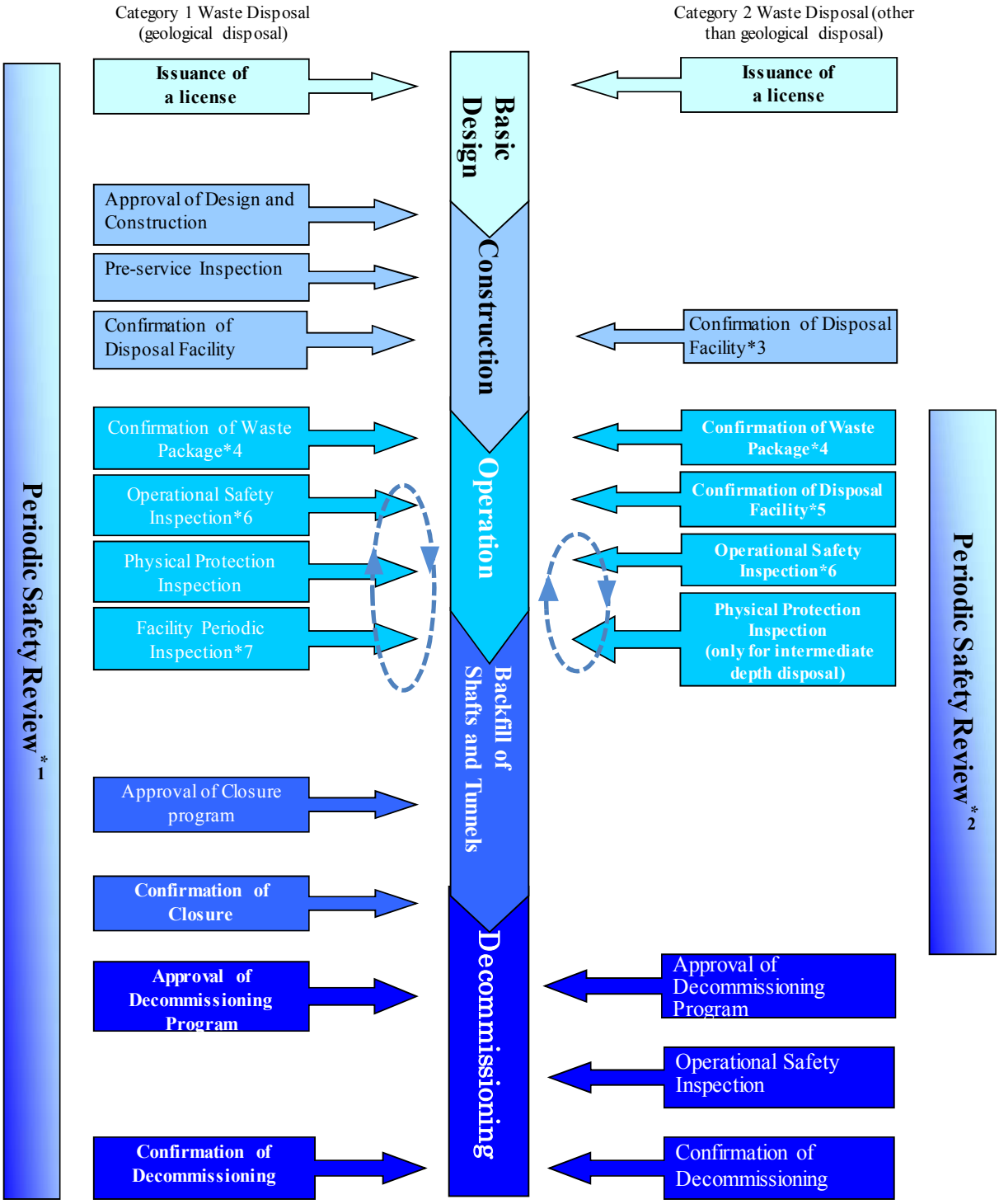
Category 1 Waste Disposal requires greater radiological safety care. Such waste contains high radioactivity concentrations with long half-life nuclides and because of this the waste must be isolated from living environments for a long period. Therefore, in addition to regulation governing Category 2 Waste Disposal described below, the approval of the closure plan and procedures to check conformity with the approved closure plan are also stipulated to ensure the proper closure of underground facilities.

Category 2 Waste Disposal regulations apply to radioactive materials in solid waste radioactive material which has a radioactivity concentration below the upper limit specified in the Order for Enforcement of the Reactor Regulation Act. It is buried by Intermediate Depth Disposal, Near-surface Pit Disposal, or Near-surface Trench Disposal, depending on the nuclides present in the radioactive materials and the radioactivity concentration thereof. Consideration is given to radioactive decay in conservation and management of such waste.

Waste management other than final disposal is defined as the Interim Storage/Treatment Business of Radioactive waste in the Reactor Regulation Act. It is governed by the Reactor Regulation Act and regulations in the Ordinance on Activity of Waste Interim Storage/Treatment of Nuclear Fuel Material and Materials Contaminated by Nuclear Fuel Material (Annex: Table H1-2) under this Act.

At present, final waste disposal from research facilities is planned by means of either Near-surface Pit Disposal or Near-surface Trench Disposal, as part of the first stage of operations.

Rubble and other waste from the accident at TEPCO's Fukushima Daiichi NPS is stored at the power station site.



*1: Assessment of the radiation control due to nuclear fuel material, etc.: Every 20 years or less after being granted a license, or when seeking to establish a closure plan or decommissioning plan
*2: Assessment of the radiation control due to nuclear fuel material, etc.: Every 10 years or less from the date of commencing business
*3: Check to ensure that the facility complies with technical standards before emplacing the waste packages: Corresponds to items 2, 3, and 7 in Article 6, paragraph 1 of the Category 2 Waste Disposal Ordinance
*4: Check to ensure that the waste packages to be buried and the measures for their operational safety comply with technical standards: When burying the waste packages
*5: Check to ensure that the facility complies with technical standards after emplacing the waste packages: Corresponds to items 1, 4, 5, 6, and 7 in Article 6, paragraph 1 of the Category 2 Waste Disposal Ordinance
*6: Operational safety program compliance inspection: Conducted quarterly (4 times a year)
*7: Inspection to confirm that facility capabilities comply with the technical requirements: Conducted annually

Figure H-1 Regulatory Processes for Category 1 and Category 2 Waste Disposal

H1 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.

H1-1 Prevention of criticality and removal of decay heat

(1)Prevention of criticality

The Reactor Regulation Act requires operators to take steps to prevent possible criticality of the nuclear fuel material in the radioactive waste that they are handling. Currently, radioactive materials handled at waste disposal facilities and waste interim storage/treatment facilities in Japan contains hardly any nuclear fuel material, so there is no possibility of its reaching criticality.

(2)Removal of decay heat

The law requires that operators take appropriate steps to remove heat from radioactive waste capable of producing decay heat.

Specifically, operators of facilities that temporarily store highly-radioactive vitrified packages returned from overseas for reprocessing are required to apply appropriate methods for removing decay heat, as part of the safe design of facilities.

H1-2 Minimization of the generation of radioactive waste

Although Japanese laws and regulations do not require that the quantity of radioactive waste be minimized, the Reactor Regulation Act requires that radioactive waste be rigorously and safely managed. Operators conduct voluntary initiatives to minimize the quantity of such waste and in so doing reduce the resources required for its management.

Under the clearance system that has been established, operators seek the Approval of Methods on Radioactivity Concentration Measurement and Evaluation for concrete, metals, and other materials generated from the nuclear installation in question, pursuant to the provisions of the Reactor Regulation Act. Material with a radioactivity concentration below the reference value does not need to be handled as radioactive waste. This system produces an accurate classification of radioactive waste and assists minimization of the generation of radioactive waste.

H1-3 Interdependencies among the different steps in radioactive waste management

The processes involved in the management of radioactive waste are governed by standardized and integrated regulations under the Reactor Regulation Act.

H1-4 Radiation protection based on international standards

Radiation protection associated with the management of radioactive waste is described in F4.

H1-5 Biological, chemical and other hazards that may be associated with radioactive waste management

Under the Reactor Regulation Act, operators are required to evaluate the issue of buried waste packages, ensuring that they do not contain substances that could destroy their integrity.

A similar system has been put into place under the Act concerning Prevention from Radiation Hazards due to Radioisotopes, etc.(Radiation Hazards Prevention Act).

H1-6 Consideration of adverse effects for future generations

As described in H2, Waste Interim Storage/Treatment and Waste Disposal Businesses that are already licensed have mechanisms to ensure appropriate management. Buried radioactive waste is either managed until it reaches a dose low enough to ensure that radiation exposure control is no longer required or is isolated from living environments. This ensures that its impact does not increase in the future.

H1-7 Consideration of undue burdens for future generations

As described in the previous section, consideration is given to ensure that undue burden is not imposed on future generations. Separate legal provisions have been established concerning expenditure associated with the disposal of vitrified packages and some radioactive waste with an extremely high concentration of radioactivity, as well as the management thereof (See Section B).

H2 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.

H2-1 Reviews to enhance the safety of existing radioactive waste management facilities

When this Convention took effect in Japan, the existing operators were the Near-surface Pit Disposal, Near-surface Trench Disposal which have Category 2 Waste Disposal licenses and Waste Interim Storage/Treatment operators. Currently, there is no Category 1 Waste Disposal operator or Category 2 Waste Disposal operator conducting Intermediate Depth Disposal. When such businesses are licensed, measures may be required to enhance the safety of facilities.

Similar to the inspections of spent fuel interim storage facilities described in G2.1, the NRA conducts periodic inspections of radioactive waste interim storage/treatment facilities and their compliance with Operational Safety Programs. It also requires operators to conduct their own periodic safety reviews.

In addition to Operational Safety Inspections, the following inspections are prescribed for each category of waste disposal facility.

(1) Category 1 Waste Disposal

Operators shall assess waste disposal sites every 20 years or less from the date of commencing business, evaluating the control of exposure to radiation due to disposed waste, taking into account the latest technical knowledge. Based on this review, they shall take requisite steps to maintain the integrity of the waste disposal facility. They must take the same steps when establishing closure or decommissioning plans.

(2)Category 2 Waste Disposal

Under legislative revisions enacted in December 2013, the periodic reviews that hitherto applied only to Intermediate Depth Disposal were also introduced for Near-surface Pit Disposal and

Near-surface Trench Disposal. Operators must assess waste disposal sites that use these methods every 10 years or less from the date of commencing business, evaluating the control of exposure to radiation from disposed waste, taking into account the latest technical knowledge. Based on such reviews, they shall take the requisite steps to maintain the integrity of the waste disposal facility. They shall take the same steps when seeking to alter operational safety measures at Category 2 Waste Disposal facilities, in response to radioactive decay.

H2-2 Past Activities

There are no past activities.

H3 Siting of proposed facilities

Article 13

1. 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 the general public;

(iv) 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.

2. 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.

H3-1 Evaluation of site-related factors

The Reactor Regulation Act requires operators to evaluate site-related factors and their impact on safety, and the NRA checks the adequacy of these evaluations when considering whether to grant a license.

The licensing criteria prescribed in the Reactor Regulation Act are the same as those for spent fuel interim storage facilities described in G3-1.

H3-2 Information disclosure for the general public

The NRA's transparency policy is; to establish an information disclosure system; to ensure open discussion and administration based on written documents. Accordingly, the NRA publishes the agenda, minutes, and reference materials of commission meetings, advisory committee meetings and study team meetings.

H3-3 Relations with neighboring contracting parties

This is the same as for spent fuel interim storage facilities, as described in G3-3.

H4 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.

H4-1 Prevention of radiological effects in the design and construction of nuclear waste management facilities

(1) Waste Interim Storage/Treatment facilities

In accordance with the Reactor Regulation Act, before beginning construction work, a waste interim storage/treatment licensee shall obtain approval for the design and construction methods of the waste receiving facility, waste handling facility, instrument and control facility, radiation control facility and emergency power equipment and disposal facilities of auxiliary facilities at waste interim storage/treatment site and pass an NRA inspection before operations start. An Application of the Approval of Design and Construction Method will includes the design of facilities for the treatment and storage of waste generated from its operation and construction method of such facilities. The application will also include documentary proof that the facility design and construction method conforms to the Technical Standard for the Design and Construction Methods for Specific Waste Disposal Facility or Specific Waste Interim Storage/Treatment Facility (Annex: Table H4-1).

The NRA will approve the application after confirming that the design and construction methods comply with the technical standards prescribed in the Reactor Regulation Act.

(2) Category 1 Waste Disposal facilities

Under the Reactor Regulation Act, before beginning construction work, Category 1 Waste Disposal licensees shall obtain approval for the design and construction methods of waste receiving facility,

waste handling facility, instrument and control facility, radiation control facility and emergency power equipment and disposal facilities of auxiliary facilities at waste disposal site and pass an NRA inspection before operations start. The procedures and technical standards for design and construction methods are the same as those for waste interim storage/treatment facilities.

Category 1 Waste Disposal facilities shall undergo an NRA check of the site and its shafts and tunnels, in accordance with the Reactor Regulation Act. This check focuses not only on the design and structure, but also on the geographical, geological, and groundwater conditions of disposal site in accordance with the Category 1 Waste Disposal Ordinance. That is, the facility must be consistent with the content described in the application document that formed the basis for the license and licensees do not dispose of explosive materials, materials that significantly corrode other materials, or other hazardous materials at the waste disposal site and licensees backfill the site as stated in the application document that formed the basis for the license. The waste packages to be disposed of must be checked by the NRA before burial, to ensure that “the waste is encapsulated or solidified”, “the radioactivity concentration does not exceed the licensed level”, “the waste package has sufficient strength to endure the loads imposed when disposed of” and “the waste is not significantly damaged”, in accordance with the Category 1 Waste Disposal Ordinance.

(3) Category 2 Waste Disposal facilities

Category 2 Waste Disposal licensees do not need to obtain NRA Approval for Design and Construction Methods or undergo a pre-service inspection of their waste disposal facilities, but they shall undergo an NRA check of the facility in accordance with the Reactor Regulation Act. The waste packages to be disposed of must also undergo an NRA check before disposal.

(4) Waste management facility under the Radiation Hazards Prevention Act

Those seeking approval for a waste disposal business under the Radiation Hazards Prevention Act shall submit an application to the NRA. It must include information explaining the method of disposal, and the location, structure and equipment of the waste refilling facility, waste storage facility, and waste disposal facility. The location, structure and equipment of each facility e.g. shielding wall or other shielding material, ventilation, drainage, shall conform with specified technical standards to minimize radiation consequence. Licensees shall undergo a pre-service facility inspection and a check to ensure that the facility complies with required technical standards.

H4-2 Provisions for the decommissioning of a radioactive waste management facility other than a disposal facility at the design stage

Procedures for the decommissioning of waste management facilities are prescribed in the Reactor Regulation Act. When decommissioning a facility, the licensee must prepare a decommissioning plan and obtain NRA approval.

In addition, under the Radiation Hazards Prevention Act, at each individual license application (including decommissioning), the licensee is subject to appropriate checks to ensure conformity to the required technical standards.

H4-3 Provisions for the closure of a disposal facility

The proposed closure of a waste disposal facility shall be described in a waste disposal license application document. If a Category 1 Waste Disposal licensee plans to close the shafts and tunnels, he is required to establish a closure plan and obtain NRA approval in accordance with the Reactor Regulation Act.

H4-4 Technologies incorporated in the design and construction of a radioactive waste management facility

As described in H6-1. Similar checks are also conducted under the Radiation Hazards Prevention Act.

H5 Safety assessment 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).

H5-1 Safety and environmental assessment of a radioactive waste management facility

(1) Disposal facility under the Reactor Regulation Act

The procedures described in H3-1 and H4-1 ensure that safety and environmental assessments of a radioactive waste management facility are carried out before construction.

(2) Disposal facility under the Radiation Hazards Prevention Act

When a license application for a disposal facility under the Radiation Hazards Prevention Act is received, the NRA examines the site conditions and compliance with technical standards, granting a license if these are met. Guidelines require that a facility must be constructed at a site that has little fear of being affected by a landslide or flooding, adopt fire-proof structures or use non-combustible materials for the essential parts of the facility and be equipped with a shielding function, such as shielding walls.

H5-2 Safety and environmental assessment for the period after closure of a disposal facility

Regulation of disposal facilities in Japan is governed by either the Category 1 Waste Disposal Ordinance or the Category 2 Waste Disposal Ordinance, depending on the category of the facility, in accordance with the Reactor Regulation Act. These Ordinances require that a license application be accompanied by an explanation concerning the control of radiation exposure due to radioactive waste. It must also contain a long-term assessment that includes the post-closure period. Licensees shall conduct ongoing periodic safety reviews as part of operational safety measures and implement any required changes. These safety reviews ensure that systematic safety evaluations continue to be

carried out until post-closure operations have been completed, and also ensure that the pre-construction review is checked in light of the latest knowledge and appropriate action is taken in response.

A similar system is being put into place under the Radiation Hazards Prevention Act.

H5-3 Update of safety and environmental assessment of a radioactive waste management facility

This is the same as for spent fuel interim storage facilities, as described in G5-2.

A similar system has been put into place under the Radiation Hazards Prevention Act.

H6 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.

H6-1 Permission to operate a radioactive waste management facility

(1) Waste Interim Storage/Treatment and Category 1 Waste Disposal

Before beginning construction, licensees of Waste Interim Storage/Treatment and licensees of Category 1 Waste Disposal shall obtain NRA approval for design and construction methods, quality control methods concerning design and construction, and an inspection regime.

Under the Reactor Regulation Act, when applying for approval of the design and construction methods, the licensee shall demonstrate that they comply with the required technical standards. The NRA gives approval if the design and construction methods comply with the technical standards.

There are prescribed technical standards for quality assurance methods focused on design and construction and organizations for the inspection thereof. These are based on requirements in the

Code of Quality Assurance for Safety of Nuclear Power Plants (JEAC 4111-2009) issued by the Japan Electric Association and also take into account overseas standards requirements, including the IAEA Safety Standard (Safety Requirement No. GS-R-3). Compliance with these standards is a requirement for approval of the design and construction methods.

The Reactor Regulation Act prescribes that such facilities must pass an NRA inspection before operations commence. A facility will pass the Pre-service Inspection if the inspector confirms that the construction has been carried out in accordance with the approved design and construction methods and that the facility's capabilities comply with the technical standards for performance. These are prescribed by the NRA and major elements include are the prevention of damage due to fire, earthquake and other calamities.

Underground facilities other than underground associated facilities at Category 1 Waste Disposal facilities undergo the same NRA checks as the Category 2 Waste Disposal facilities described in the next paragraph.

(2) Category 2 Waste Disposal

Category 2 Waste Disposal requires no approval for the design and construction methods, so no Pre-service Inspection is required. However, such waste disposal facilities must undergo an NRA check in accordance with the Reactor Regulation Act. These checks take place as follows:

- The structure of the waste disposal facility, apart from the radiation control facility, is checked when the dimensions of the major elements of individual systems can be measured.
- The structure of the radiation control facility is checked when the facility has been completed.
- The closure of shafts and tunnels (in the case of Intermediate Depth Disposal facilities) is checked when backfill of the shafts and tunnels and closure of the mouth are carried out.
- Other matters are checked when the waste disposal facility is buried or when the NRA otherwise deems it appropriate.

These checks are carried out in accordance with the technical standards shown in Table H6-1 in the Annex (1. Technical Standard for Waste Disposal Facilities and 2. Technical Standard for Radioactive Waste to be disposed of).

(3) Radioactive waste management under the Radiation Hazards Prevention Act

Operators of waste management facilities under the Radiation Hazards Prevention Act are subject to license approval, mainly as described in the previous section. In addition, licensees must not operate the facility unless it has passed a inspection before operations commence.

As described above, the Government of Japan takes steps to ensure that a license to operate a waste disposal facility or waste interim storage facility is based upon appropriate assessments as specified in the previous Article and is conditional on the completion of a commissioning program demonstrating that the facility, as constructed, is consistent with design and safety requirements.

H6-2 Operational limits and conditions

Licensees shall establish an Operational Safety Program in accordance with the Reactor Regulation Act and obtain NRA approval before starting facility operations. The Operational Safety Program shall specify the precise methods to be used in operating the facility, maintenance checks, radiation monitoring, and quality assurance. Licensees shall stipulate the specific operational limits in the Operational Safety Program, and must operate and maintain the facility in accordance with these. Licensees must undergo quarterly NRA's Operational Safety Inspections to confirm compliance with their Operational Safety Program. In addition, if the annual Periodic Facility Inspection indicates that a Waste Interim Storage/Treatment facility or Category 1 Waste Disposal facility does not comply with the statutory technical standards, or the measures concerning its maintenance violate the NRA Ordinance, the NRA may order the licensee to take steps necessary to ensure operational safety, including suspension of operation, modification, repair, or compliance with a specified method of operating equipment.

Before starting operations, disposal operators licensed under the Radiation Hazards Prevention Act shall prepare Rules for Preventing Radiation Hazards, specifying details of inspections, radiation measurement, and treatment of radioactive waste, and shall notify the NRA of these rules. Licensees shall stipulate the specific operational limits in the Rules for Preventing Radiation Hazards, and shall operate and maintain the facility in accordance with these.

H6-3 Operation, maintenance, monitoring, inspection and testing of a radioactive waste management facility

(1) Waste Interim Storage/Treatment

When operating a facility, the licensee shall implement the necessary operational safety measures for "maintenance of a Waste Interim Storage/Treatment facility", "operation of a Waste Interim Storage/Treatment facility" and "transportation and treatment (within the premises where the Waste Interim Storage/Treatment facility has been installed) of nuclear fuel material or materials contaminated with nuclear fuel material" in accordance with the provisions of the Reactor Regulation Act. There are legal provisions concerning operational safety measures in the following

areas: “records of radiation control, (records of monitoring results)”, “restrictions on access to controlled areas”, “measures concerning radiation dose”, “walkdown and inspection of Waste Interim Storage/Treatment facilities”, “maintenance of Waste Interim Storage/Treatment facilities”, “periodical self-inspection of Waste Interim Storage/Treatment facilities”, “operation of facilities associated with Waste Interim Storage/Treatment facilities”, “Periodical Safety Review of Waste Interim Storage/Treatment facilities”, “on-site transportation” and “on-site disposal”.

Licensees shall establish an Operational Safety Program that covers these matters and obtain NRA approval for this before starting operations. (Annex: Table H6-2 details the matters to be specified in the Operational Safety Program.)

In addition, as described in the previous section, licensees shall undergo periodic Operational Safety Inspections by the NRA to confirm compliance with their Operational Safety Program.

(2) Category 1 and 2 Waste Disposal

The Reactor Regulation Act requires licensees of a waste disposal facility to take the same steps as described above concerning waste interim storage/treatment facilities. Relevant legislation prescribes periodic evaluation of waste disposal facilities following any closure of such a facility. Specifically, operators are required to evaluate radiation control from nuclear fuel material in accordance with the latest technical knowledge available and to maintain the waste disposal facility on the basis of this evaluation. In the case of Category 1 Waste Disposal, this is to be carried out every 20 years or less from the date of obtaining a license and when establishing a closure plan or decommissioning plan. For Category 2 Waste Disposal, this shall be done every 10 years or less from the date of obtaining a license, and when seeking to alter the operational safety measures at Category 2 waste disposal facilities, in response to radioactive decay.

(3) Radioactive waste management under the Radiation Hazards Prevention Act

Before starting operations, waste disposal operators licensed under the Radiation Hazards Prevention Act shall notify the NRA of the Rules for Preventing Radiation Hazards. Periodic facility inspections and on-site NRA inspections check that the radioactive waste management facility is being operated appropriately.

H6-4 Engineering and technical support in all safety-related fields

This is the same as for spent fuel interim storage facilities, as described in G6-4.

H6-5 Characterization and classification of radioactive waste

The Reactor Regulation Act regulates on-site waste treatment, categorizing waste as either gaseous, liquid or solid waste, and prescribing methods for on-site treatment of these various categories. Examples of these regulations are shown in Annex: Table H6-3.

In addition, methods involving disposal by burial are categorized into Category 1 waste disposal and Category 2 waste disposal, according to the concentration of each radionuclide in the waste, as stipulated in the Order for Enforcement of the Reactor Regulation Act.

A similar system has already been put in place under the Radiation Hazards Prevention Act for waste not subject to disposal by burial, and a system targeting waste subject to burial is currently being developed.

H6-6 Timely licensee reports to the regulatory body on the safety-related events

If a personal injury accident (including incidents with the potential for personal injury) or a failure or other events occur at a nuclear installation, the licensee shall report the situation and other necessary matters to the NRA without delay, in accordance with the Reactor Regulation Act. Such incidents subject to reporting are specified in relevant legislation regulating the activity concerned.

The Radiation Hazards Prevention Act also requires operators to report to the regulatory body without delay the details of any accidents at a radioactive waste management facility and any subsequent measures taken.

H6-7 Programs to collect and analyze relevant operating experience

This is the same as for spent fuel interim storage facilities described in G6-6.

H6-8 Decommissioning plans for a radioactive waste management facility other than a disposal facility

An operator licensed under the Reactor Regulation Act that plans to terminate its operation shall implement the necessary decommissioning measures, such as dismantling the waste management facility, removal of contamination from nuclear fuel material, and disposal of contaminated nuclear fuel materials, in accordance with the Reactor Regulation Act. In this regard, operators shall establish a decommissioning plan and obtain NRA approval.

Criteria to approve a decommissioning plan are that all solid nuclear fuel material being managed or all liquid or solid nuclear fuel material being disposed of have been removed from the waste management facility; nuclear fuel material is appropriately managed, treated, and disposed of; and

decommissioning work is implemented to prevent hazards arising from nuclear fuel materials. Information obtained during the operation of a facility to be decommissioned should be incorporated into a decommissioning plan and utilized in the management and disposal of contaminated material and for hazard prevention. The Approval for Modification of Decommissioning Plan procedure has been prescribed to allow decommissioning plans to be updated when necessary. When terminating its activity, the operator of a radioactive waste management facility licensed under the Radiation Hazards Prevention Act shall notify the NRA. The operator shall take steps including the removal of radioactive isotope contamination, and must use information gained during the operation of the facility to prepare an action plan for this. The operator shall then report to the NRA the plan and steps to be taken and the regulatory body will be involved where appropriate.

H6-9 Plans for the closure of a disposal facility

When a Category 1 waste disposal licensee plans to close the tunnels and shafts, it shall take closure measures, including backfill of tunnels and shafts, closure of entrances, and dismantling of associated facilities underground. In this regard, operators shall first establish a closure plan and obtain NRA approval for it, in accordance with the Reactor Regulation Act.

A closure plan shall ensure that closure activities are carried out in accordance with the license application documents and the Reactor Regulation Act. Closure work shall ensure the prevention of any hazards from nuclear fuel materials. Operational experience should be used in preparing a closure plan and to bolster hazard prevention. The Approval for Modification of Closure Plan procedure has been prescribed to allow closure plans to be updated when necessary. Closure plans are subject to examination and approval by the regulatory body.

An operator of a radioactive waste disposal facility licensed under the Radiation Hazards Prevention Act shall implement the necessary measures to prevent radiation hazards from buried waste when terminating the facility's operation. The operator shall incorporate information gained during the management of the facility to prepare an action plan and then report to the NRA all steps to be taken. The regulatory body will become involved where appropriate.

H7 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.

H7-1 Preservation of the requisite records

(1) Category 1 Waste Disposal

Disposal operators shall preserve on-site and for a specified period the following records in accordance with the Reactor Regulation Act.

· Records of the disposal of Category 1 waste

· Records of inspections of waste receiving facility, waste handling facility, instrument and control facility, radiation control facility and emergency power equipment and disposal facilities of auxiliary facilities at waste disposal site

· Radiation control records

· Operations records

· Maintenance records

· Records of accidents at the waste disposal facility

· Meteorological records

· Records of groundwater levels

· Records of operational safety education

· Documents concerning the quality assurance plan and records of planning, implementation, evaluation, and improvement conducted in accordance with said plan

· Results of periodic assessment of the waste disposal facility

· Records of physical protection measures

· Results of closure checks

· Methods and timing of decommissioning, and names of associated facilities at the waste disposal site to be decommissioned

· Records of materials subject to clearance confirmation

(2) Category 2 Waste Disposal

As is the case for Category 1 Waste Disposal, operators shall preserve on-site and for a specified period the following waste disposal records in accordance with the Reactor Regulation Act.

· Records of the disposal of Category 2 waste
· Radiation control records
· Details of alarms from alarm devices
· Maintenance records
· Records of accidents
· Rainfall records
· Records of groundwater levels
· Condition of the waste disposal site and surrounding area
· Records of operational safety education
· Documents concerning the quality assurance plan and records of planning, implementation, evaluation, and improvement conducted in accordance with said plan
· Results of periodic assessment of the waste disposal facility
· Records of physical protection measures
· Methods and timing of decommissioning, and names of associated facilities at the waste disposal site to be decommissioned
· Records of materials subject to clearance confirmation

H7-2 Active or passive institutional controls for monitoring and access control

(1) Category 1 Waste Disposal

The Reactor Regulation Act prescribes the decommissioning procedures (dismantling of associated facilities at the waste disposal site, removal of contamination due to nuclear fuel materials, transfer of nuclear fuel materials and other radioactive materials, and transfer of radiation control records to an organization designated by the NRA) to be implemented after closure of a Category 1 Waste Disposal facility. Operators intending to carry out decommissioning measures shall obtain NRA approval for their decommissioning plan. When establishing a decommissioning plan, operators are required to evaluate radiation exposure control due to nuclear fuel materials taking into account the latest technical knowledge and to maintain the waste disposal facility on the basis of the results of this evaluation.

The activity terminates when it is confirmed that no radiation hazard prevention measures are required at the site of associated facilities to be decommissioned, as well as for facilities remaining

at the site; that disposal of nuclear fuel materials has been completed; and that transfer of radiation control records to an organization designated by the NRA has been completed.

Institutional control of a closed facility must contribute to further reducing the possibility of inadvertent interference with waste or other human activities, and to the promotion of public acceptance of geological disposal and safety.

As an example of a specific institutional control, the Final Disposal Act designates the released site as a protected area upon application by the operator and restricts excavation work within said area.

(2)Category 2 Waste Disposal

The NRA Ordinance Prescribing Standards for the Location, Structure, and Equipment of Category 2 Waste Disposal Facilities (hereinafter referred to as the "Category 2 Equipment Standards Ordinance") requires that operators conduct a safety evaluation after active control ends, including an assessment of the potential radiation dose which the public may experience in two different scenarios: possible and less likely situations. The Ordinance stipulates that the annual dose in each scenario must not exceed 10 microsieverts and 300 microsieverts, respectively; in addition, in the natural phenomenon scenario and human intrusion scenario, the annual dose received by the public must not exceed 1 millisievert, giving due consideration to site conditions. To ensure that the public would be exposed to the lowest achievable level, operators must manage waste disposal sites commensurate with the type and radioactivity level of radioactive solid waste buried there until levels no longer pose a threat to safety.

The management required under the Category 2 Equipment Standards Ordinance is as follows.

(i) Near-surface Pit Disposal[4]

<From receipt of the radioactive waste to be buried until burial ends>

During this period, a Surrounding Monitored Area shall be established around the waste disposal facility and access to it restricted. A disposal conservation area shall also be established subject to patrols and inspections. Monitoring will ensure that there is no leakage of radioactive materials from the engineered barriers[5] constructed at the waste disposal site. If any such leakage is discovered, requisite measures such as repairing the engineered barriers shall be undertaken.

<From the end of burial until the start of decommissioning>

During this period, a Surrounding Monitored Area shall be established and access to this area

[4] "Near-surface pit disposal" means the disposal of radioactive waste, which has been placed in containers or solidified, in the near-surface repository of a waste disposal site equipped with an engineered barrier.

[5] "Engineered barrier" means an engineered structure which is installed to prevent or to reduce the leakage of radioactive material from buried radioactive solid waste into the living environment..

restricted, but this area may be abolished if the radiation levels potentially affecting the general public has been redacted to acceptable levels by radioactive decay. If the Monitored Area is abolished, farming and other specified activities shall be prohibited or restricted in any neighboring disposal conservation areas which will be policed by walkdown and inspections.

Any radioactive material leaking from the waste disposal site into the living environment shall be monitored by measuring the concentration of radioactive material in groundwater and other parameters.

(ii) Near-surface trench disposal[6]

<From receipt of radioactive waste to be buried until the procedure is completed

During this period, a Surrounding Monitored Area shall be established around the waste disposal facility and access restricted. A disposal conservation area shall also be established which shall be subject to patrols and inspections. The concentration of radioactive material seeping into surrounding areas shall be monitored by measuring the concentration of radioactive material in groundwater and other parameters.

<From the end of burial until the start of decommissioning>

During this period, a disposal conservation area shall be established and patrols and inspections conducted there. Farming and other specified activities shall be prohibited or restricted in said area.

Consequently, safety assessments of waste disposal facilities during the active control period should be tailored to the nature of the waste management, as described above, taking into account any decrease in effectiveness over time of the waste disposal site systems. .

Active control of pit disposal sites should be terminated within 300-400 years of burial. In the case of trench disposal, it should be terminated within 50 years, as the buried waste is non-solidified concrete with a low level of radioactivity.

H7-3 Intervention measures

When issuing a license, the NRA requires the operator to take the following measures during each stage of institutional control.

If a leakage of radioactive material from engineered barriers is detected during the period from

[6] "Near-surface trench disposal" means the disposal of radioactive solid waste, which has not been solidified in a container, in the near-surface repository of a waste disposal site not equipped with an engineered barrier.

receipt of the radioactive waste to be buried until burial ends, Category 2 Waste Disposal operators seeking to conduct Near-surface Pit Disposal shall immediately repair the barriers to prevent leakage. During the period from the end of burial until the start of decommissioning, the operator shall monitor the status of radioactive material leakages from both engineered barriers and natural barriers[7] and, if necessary, take steps to minimize the escape of radioactive materials. In addition, the operator shall patrol and inspect the waste disposal site and, if necessary, restore the soil cover or take other remedial measures. A similar system has also been put in place under the Radiation Hazards Prevention Act.

[7] "Natural barrier" means the host rock or the ground that exists around the engineered structure or the buried radioactive solid waste, which is expected to restrict migration into the living environment of any radioactive material leaking from the buried radioactive solid waste.

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 power utilities in Japan have concluded reprocessing contracts with the United Kingdom and French companies and exported 7,100MTU of spent fuel between 1969 and 2001. They, in return, receive nuclear fuel material recovered from the spent fuel and vitrified waste generated in the reprocessing. 1,422 vitrified waste canisters were sent back to Japan between 1995 and March 2014 and the remaining packages will be returned in the next approximately five years. As they are constructing a reprocessing

plant at Rokkasho Village in Aomori Prefecture since 1993, there has not been any contract of spent fuel with the United Kingdom and French companies after 2002.

I1 Transboundary movement

I1-1 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.

I1-2 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.

I1-3 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.

I1-4 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 judges the grant of 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.

I1-5 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.

I2 Prohibition of shipment to a destination south of latitude 60 degrees 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 Ministry of Economy, Trade and Industry 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.

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.

J1 Regulatory framework for sealed sources

The use and disposal of radioisotopes and the use of radiation generation apparatuses is regulated by the Act concerning Prevention from Radiation Hazards due to Radioisotopes, etc.(Radiation Hazards Prevention Act), as mentioned in paragraph E2.1. Sealed sources are also regulated by this Act. Each of an estimated 8,000 licensees is responsible for safety and ensuring that radioisotopes are properly controlled.

The NRA, as the competent regulatory authority, conducts safety reviews and on-site inspections.

The safety of radioactive sources are effectively ensured through regulation under this Act, as described below.

· A person who intends to use a larger quantity of radioactive sources than specified shall apply to the regulatory authority for a license, or notify said authority.

· The Radiation Hazards Prevention Act prescribes technical criteria and requirements for the use of facilities and other criteria such as dose limits for radiation workers. For example, to ensure radiation safety, the licensee must: a) limit access to storage facilities through the use of locks; b) install walls or fences to restrict easy access to the boundary of controlled areas; and c) prohibit entry into controlled areas without permission of the facility supervisor.

· The licensee is responsible for annually submitting to the regulatory authority a facility management report, including the inventory of radioactive sources at the end of the fiscal year. The regulatory authority carries out on-site facility inspections, if needed, and checks that the inventory of radioactive sources corresponds to the amount permitted to the license.

· In accordance with the IAEA's Code of Conduct on the Safety and Security of Radioactive Sources, business operators must report to the NRA details of the specification, receipt and issue of any sealed radioactive isotopes above a set amount which have potential significant risks to human health. In addition, they must provide the NRA with a report on any such radioactive sources in their possession at the end of each fiscal year.

As a result of this strict regulatory system, there have been no occurrences that pose significant risks to the public, such as exposure to "orphan sources".

J2 Management of radioactive sources

Legal restrictions are imposed to ensure that the licensee only hands over high activity sealed radioactive sources to authorized license holders. There is a well-established mechanism for the handover of disused radioactive sources to licensees with the requisite expertise. Licensees are

obliged to submit notification of a decommissioning plan to the regulatory authority when they terminate the use of sources, and to report the outcome of the handover.

All licensees shall conduct an annual inventory check of both sealed and unsealed radioactive sources in their possession and report the results to the regulatory authority, to prevent the occurrence of orphan sources. The Radiation Hazards Prevention Act prescribes penalties and underlines that responsibility for managing the safety of radioactive sources lies with the licensee.

Most sources in Japan are imported from overseas; sources with a long half-life and high activity are returned to the original foreign manufacturers. Regarding the distribution of radioisotopes and sealed sources in Japan, a single supplier (the Japan Radioisotope Association) organizes the entire process, from distribution and delivery of almost all radioactive sources to the recovery of disused radioactive sources.

As a result, there have been no serious radiation hazard incidents involving radioactive sources or orphan sources to date.

J2-1 Criteria for the storage of disused sealed radioactive sources

The Radiation Hazards Prevention Act prescribes the following technical criteria relating to the storage of sealed sources.

(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 measures, such as a) installing shields, b) distancing personnel from sealed sources, and c) shortening the time during which personnel may be exposed to radiation, shall be taken to prevent radiation workers being exposed to levels exceeding the effective dose limit.
(4) Appropriate measures, such as immobilizing storage bins, shall be taken to prevent containers storing sealed sources from being transferred from one place to another without permission.
(5) Appropriate measures shall be taken to prevent surface contamination from exceeding the surface contamination density limit.
(6) Radioactive contaminated substances whose surface concentration exceeds one-tenth of the surface contamination density limit shall not be taken out of the controlled area without permission.
(7) A notice showing the precautions necessary to prevent radiation hazards shall be posted at an appropriate location within storage facilities.
(8) Appropriate measures shall be taken to prevent unauthorized persons entering a controlled area.

J2-2 Response to missing radioactive sources

In case of loss of any radioactive sources, the licensee shall immediately report the matter to the police and the regulatory authority. The regulatory authority will order the licensee to conduct an immediate search for the lost source, while the police will carry out a criminal investigation if the

loss is associated with a criminal act.

The NRA will also conduct an INES rating of the loss, in accordance with the additional guidance for rating events related to radiation sources, and will report the resultant rating to the IAEA.

J2-3 Response to orphan sources

If an orphan source is found, the police will immediately take initial action, including setting up an exclusion area, conducting a radiation survey and immediately assessing the overall situation. The regulatory authority will instruct the person who found the source and other relevant people to take safety precautions. The regulatory authority will dispatch a radiation inspector to confirm that proper safety measures have been taken. The orphan source will be recovered by an appropriate expert.

J2-4 Response to accidents involving radioactive sources

In the event of an accident involving a radioactive source, the police and fire service will carry out immediate measures depending on the notification. The regulatory authority will dispatch radiation inspectors to instruct the licensee on the proper measures to be implemented.

J2-5 Long-term management of sealed radioactive sources unreturnable to the manufacturers

As previously described, most sealed radioactive sources used in Japan are manufactured abroad, imported and then returned to foreign manufacturers after use. Therefore, Japan has few sealed radioactive sources that are unreturnable to the manufacturers. The storage and management of some unreturnable sealed radioactive sources are carried out pursuant to the Radiation Hazards Prevention Act. Accordingly, there are no specific issues at present concerning unreturnable sealed sources.

J3 Reentry of returning sealed sources

The reentry of approved sealed sources which have been returned from abroad by a manufacturer licensed under the Radiation Hazards Prevention Act is allowed within the scope of the storage capacity stipulated in the license. In this situation, licensees, when importing and exporting such sources, shall comply with legislation or procedures concerning import-export management consistent with the IAEA's Guidance on the Import and Export of Radioactive Sources. A manufacturer intending to possess or renew the returned sealed sources is required to store them in accordance with the storage criteria prescribed in the Radiation Hazards Prevention Act.

Section K General Efforts to Improve Safety

K1 The IRRS

In December 2013, the NRA discussed the IAEA (International Atomic Energy Agency) Integrated Regulatory Review Service (IRRS) mission and agreed (1) to aim to host the mission at the end of 2015; and (2) to move forward with preparations including liaison with the IAEA. The NRA submitted an IRRS request to the IAEA that month and obtained the IAEA's approval for the mission to go ahead. The NRA has established an IRRS Office within the NRA Secretariat and is preparing for the IRRS mission.

K2 Response to Challenges Identified at the Previous Review Meeting

K2-1 Effective independence of the regulatory authority

The decision-making independence of the NRA is prescribed in law and details are provided in Section E.

K2-2 Strengthening of the regulatory requirements for the management of spent fuel and radioactive waste

The Reactor Regulation Act was revised in 2012. Revisions included adoption of state-of-the-art knowledge, the introduction of backfit systems to which even already authorized nuclear facilities will be required to conform, and the introduction of an approval system allowing the operational period of power reactors to be extended once only beyond the current period of 40 years from the commissioning, as long as permission is received before that 40-year period has elapsed.

This section describes regulations governing spent fuel interim storage activity, waste interim storage/treatment activity, and waste disposal activity in Japan.

K2-2-1 Spent fuel interim storage activity

The new regulatory requirements concerning spent fuel interim storage activity focus on facilities that store spent fuel in metallic dry storage casks (hereinafter referred to as "metal casks") that are used for both transport and storage purposes. Based on the earlier Basic Guide for Safety Review of Nuclear Fuel Cycle Facilities (decision of the Nuclear Safety Commission, February 7, 1980) and Safety Examination Guidelines for Spent Fuel Interim Storage Facilities Using Metallic Dry Casks (decision of the Nuclear Safety Commission, October 3, 2002), they prescribe standards for the location, structures, and equipment of spent fuel interim storage facilities. They have strengthened the requirements used in earthquake and tsunami evaluation, concerning the method for establishing the Design Basis Earthquake Ground Motion and the prevention of tsunami damage to spent fuel interim storage facilities. They also require the maintenance of spent fuel interim storage facilities in accordance with the earlier regulations. The basic safety functions required under the new regulatory requirements are as follows.

- Confinement function: confines the spent fuel placed in metal casks so that it does not pose radiation hazards to the public or workers
- Shielding function: shields against radiation from the spent fuel placed in metal casks so that it does not pose radiation hazards to the public or workers
- Criticality prevention function: prevents the spent fuel reaching criticality
- Heat removal function: removes decay heat from the spent fuel placed in metal casks to maintain the integrity of both the spent fuel and the components of the metal casks

K2-2-2 Waste interim storage/treatment activity

The new regulatory requirements have clarified the requirements for the storage and treatment of radioactive waste, taking into account the property of the waste interim storage/treatment facility. They have also strengthened the requirements used in earthquake and tsunami evaluation concerning the method for determining the Design Basis Earthquake Ground Motion and the prevention of tsunami damage to waste interim storage/treatment facilities. A new regulation requires that licensees conduct regular evaluations, including the aging management, as measures to ensure operational safety.

K2-2-3 Waste disposal activity

The new regulatory requirements have strengthened the standard concerning the prevention of earthquake and tsunami damage to waste disposal facilities and those concerning the maintenance of waste disposal site. They have also clarified the criteria for ending the management of such facilities. To ensure operational safety, a new regulation requires that business operators also assess the radiation control program for radiation exposure from nuclear fuel material at Category 2 Waste Disposal facilities conducting near-surface disposal, taking into account the state-of-the-art knowledge concerning facility maintenance,.

K2-3 Ensure the availability of management routes for the expected SF and RW inventories arising from the Fukushima Dai-ichi NPP accident.

K2-3-1 Sammary of Decommissioning and Contaminated Water Management

Page that the link represents information on works and steps for the decommissioning, contaminated water countermeasures and status of seawater monitoring, etc..

http://www.meti.go.jp/english/earthquake/nuclear/decommissioning/pdf/20140731_e.pdf

K2-3-2 Decontamination and Management of Waste Contaminated with Radioactive Materials at off-site

See Supplemental data attached separately.

K2-4 Geological disposal of high-level radioactive waste

The Final Disposal Act enacted in May 2000 provides for the basic framework for systematically and securely carrying out the final disposal of the high level radioactive wastes generated from spent fuel reprocessing.

As this situation where an investigation has not been launched to select a repository site after a decade since the creation of the disposal system in 2000 was taken with sincerity, a review was conducted to fundamentally reassess the efforts which have taken up until now to achieve final disposal. Specifically, that reversibility and retrievability be assured and that a system be put in place which, including the future generation, allows for the reconsideration of decisions concerning final disposal, also, that the government explains from a scientific viewpoint the properties of the area's geological environment by indicating regions believed to be more scientifically suitable, and request the reasoning for siting of such a facility. (See Section B)

K2-5 Siting criteria for radioactive waste disposal from non-nuclear power plant field

MEXT amended a part of the "Law for the Incorporated Administrative Agency, JAEA", in June. 2008, and JAEA was designated as the implementing entity of the disposal of the waste from research facilities, etc. MEXT issued the "Basic Policy for Implementation of Waste Disposal" together with METI. JAEA established the "Plan for Implementation of Waste Disposal" according to the Basic Policy and received approval from Ministers of MEXT and METI in November 2009. Concept design for the burial facility and architecture of equipment was completed in 2011.Implementation plan was changed based on concept design in 2012. In light of above, JAEA has been organized result of consideration for siting criteria and technical matters of process. Currently, JAEA has been designing the criteria and process.

Section L ANNEXES

L1 Inventory of spent fuel

L2 Inventory of radioactive waste

L3 List of spent fuel storage facilities and radioactive waste storage facilities

L4 Excerpt of Regulations Relevant to Sections G and H

L1 Inventory of spent fuel*1

Facility		Inventory (tons)	Type of spent fuel
JAPCO	Tokai No. 2 Power Station	370	Uranium oxide fuel assemblies
	Tsuruga Power Station	580	
Hokkaido Electric Power Co., Inc.	Tomari Power Station	400	
Tohoku Electric Power Co., Inc.	Higashidori Nuclear Power Station	100	
	Onagawa Nuclear Power Station	420	
TEPCO	Fukushima Daiichi Nuclear Power Station	- *2	
	Fukushima Daini Nuclear Power Station	1,120	
	Kashiwazaki-Kariwa Nuclear Power Station	2,370	
Chubu Electric Power Co., Inc.	Hamaoka Nuclear Power Station	1,140	
Hokuriku Electric Power Co., Inc.	Shika Nuclear Power Station	150	
The Kansai Electric Power Co., Inc.	Mihama Power Station	390	Uranium oxide fuel assemblies, MOX fuel assemblies
	Ohi Power Station	1,420	Uranium oxide fuel assemblies
	Takahama Power Station	1,160	
The Chugoku Electric Power Co., Inc.	Shimane Nuclear Power Station	390	
Shikoku Electric Power Co., Inc.	Ikata Power Station	610	
Kyushu Electric Power Co., Inc.	Genkai Nuclear Power Station	870	
	Sendai Nuclear Power Station	890	
JAEA	Reactor Decommissioning R&D Center	70	Uranium oxide fuel assemblies, MOX fuel assemblies
	FBR Research and Development Center	0	
	Reprocessing Facility of the Nuclear Fuel Cycle Engineering Laboratories,	41	Uranium oxide fuel assemblies, MOX fuel

	Tokai Research and Development Center		assemblies
	Nuclear Science Research Institute, Tokai Research and Development Center	18	Uranium oxide fuel assemblies
	Oarai Research and Development Center	16	Uranium oxide fuel assemblies, MOX fuel assemblies
JNFL	Rokkasho Reprocessing Faclityt	2,951	Uranium oxide fuel assemblies
Total		16,869	

*1 Data is provided by the Federation of Electric Power Companies of Japan.

*2 The measurement method is under consideration.

L2 Inventory of radioactive waste

L2-1 High-level radioactive waste

Facility		Vitrified waste (number of containers*)	High-level liquid radioactive waste
JAEA	Reprocessing facility	247	415 m^3
JNFL	Reprocessing facility	346	0
	Waste storage facility	1,442	0
Total		2,035	415 m^3

*Unit: JAEA: 120-liter container, JNFL (reprocessing facilities): 160-liter container; JNFL (waste storage facilities): 170-liter container

L2-2 Power station waste

1. Homogeneous solid, packed solid and miscellaneous solid

Power station		Homogeneous solid (drums)	Packed solid (drums)	Miscellaneous solid (drums)	Total (drums)
JAPCO	Tokai Power Station	0	0	1,503	1,503
	Tokai No. 2 Power Station	498	1,373	57,113	58,984
	Tsuruga Power Station	2,548	771	65,276	68,595
Hokkaido Electric Power Co., Inc.	Tomari Power Station	884	0	8,434	9,318
Tohoku Electric Power Co., Inc.	Onagawa Nuclear Power Station	1,972	140	25,420	27,532
	Higashidori Nuclear Power	0	0	10,404	10,404

	Station				
TEPCO	Fukushima Daiichi Nuclear Power Station	15,784	2,789	167,077	185,650*
	Fukushima Daini Nuclear Power Station	644	1,717	17,376	19,737
	Kashiwazaki-Kariwa Nuclear Power Station	0	855	30,273	31,128
Chubu Electric Power Co., Inc.	Hamaoka Nuclear Power Station	3,334	2,568	29,171	35,073
Hokuriku Electric Power Co., Inc.	Shika Nuclear Power Station	8	786	5,696	6,490
The Kansai Electric Power Co., Inc.	Mihama Power Station	2,296	2,618	23,399	28,313
	Takahama Power Station	4,809	0	39,191	44,000
	Ohi Power Station	3,803	4,016	24,313	32,132
The Chugoku Electric Power Co., Inc.	Shimane Nuclear Power Station	278	1,073	25,482	26,833
Shikoku Electric Power Co., Inc.	Ikata Power Station	1,258	844	25,775	27,877
Kyushu Electric Power Co., Inc.	Genkai Nuclear Power Station	3,969	2,732	30,603	37,304
	Sendai Nuclear Power Station	2,175	0	19,310	21,485
JAEA	Reactor Decommissioning R&D Center	2,016	0	16,958	18,974
	Fast Breeder Reactor *Monju,* Research and Development Center	20	0	5,544	5,564
Total		46,296	22,282	628,318	696,896

Unit: 200-liter drum; For miscellaneous solids, values include those equivalent to 200 liters per drum.
*In addition, rubble, trimmed trees, disused-protective clothing generated after accident, etc.[total 201,300m^3], and secondary waste from contaminated water treatment[848 cesium absorption apparatus and absorption vessel etc. and Sludge 597m^3] have been temporarily stored.

2. Steam generator (SG)

Power station		Number of stored SGs
The Kansai Electric Power Co., Inc.	Mihama Power Station	7
	Takahama Power Station	6

	Ohi Power Station	8
Shikoku Electric Power Co., Inc.	Ikata Power Station	4
Kyushu Electric Power Co., Inc.	Genkai Nuclear Power Station	4
	Sendai Nuclear Power Station	3
Total		32

3. Control rods, channel boxes, others

Power station		Control rod (number)*[1]	Channel box (number)	Others (m^3)	Resin, (m^3)
JAPCO	Tokai Power Station	91 m^3	0	1,290	60
	Tokai No. 2 Power Station	306	3,621	17	898
	Tsuruga Power Station (Unit 1)	173	1,850	49	845
	Tsuruga Power Station (Unit 2)	353	0	0	92
Hokkaido Electric Power Co., Inc.	Tomari Power Station	312	0	0	103
Tohoku Electric Power Co., Inc.	Onagawa Nuclear Power Station	231	3,112	1	464
	Higashidori Nuclear Power Station	67	644	0	132
TEPCO	Fukushima Daiichi Nuclear Power Station	1,448	22,291	193	3,522
	Fukushima Daini Nuclear Power Station	699	9,233	43	5,250
	Kashiwazaki-Kariwa Nuclear Power Station	800	13,547	0	2,592
Chubu Electric Power Co., Inc.	Hamaoka Nuclear Power Station	550	11,020	33	2,678
Hokuriku Electric Power Co., Inc.	Shika Nuclear Power Station	69	1,094	0	157
The Kansai Electric Power	Mihama Power Station	696	0	0	102
	Takahama Power Station	1,336	0	0	121

Co., Inc.	Ohi Power Station	1,134	0	0	112
The Chugoku Electric Power Co., Inc.	Shimane Nuclear Power Station	285	4,478	56	851
Shikoku Electric Power Co., Inc.	Ikata Power Station	686	0	0	165
Kyushu Electric Power Co., Inc.	Genkai Nuclear Power Station	778	0	0	174
	Sendai Nuclear Power Station	460	0	0	150
Subtotal		10,383 +(91 m^3)	70,892	(1,682m^3)	(18,468m^3)
		Control rod (number)	Neutron detector (number)	Others (number)	Resin, etc. (m^3)
JAEA	Reactor Decommissioning R&D Center	54	128	0	216
		Tubes for guiding the drive mechanisms of control rods (number)			
JAEA	Fast Breeder Reactor Research and Development Center (Monju)	5			

*1: Figures of the Tokai Power Station are not included.

L2-3 Long half-life low heat generating radioactive waste

Facility		Drum (number)	Bituminized solid (drums)	Plastic solid (drums)	Other waste (drums)	Total (drums)
JAEA	Reprocessing facility	32,075	29,967	1,812	12,205	76,059
JNFL	Reprocessing facility	16,318	0	0	21,550	37,868
JNFL	waste storage facility	1,004	0	0	48	1,052

Subtotal		43,634	29,967	1,812	28,031	103,444
		Sheared cladding (drums)		Spent filter (drums)	Sample bottle (drums)	Total (drums)
JAEA	Reprocessing facility	4,958		315	1,360	6,633
JNFL	Reprocessing facility	219*[1]		0	0	219
		Low activity concentrated liquid waste (m^3)		Sludge (m^3)	Waste solvent (m^3)	
JAEA	Reprocessing facility	2,887		1,158	101	

Unit: 200-liter drum, including values equivalent to 200 liters per drum

*1: Unit for a piece of sheared cladding: 1,000-liter drum

L2-4 Uranium waste

		Drum (number)	Other waste (drums)	Total (drums)	Low-level liquid waste (m^3)
Global Nuclear Fuel-Japan Co., Ltd.		16,384	2,550	18,934	0.096
Mitsubishi Nuclear Fuel Co., Ltd.		9,566	606	10,172	1.80
Nuclear Fuel Industries, Ltd.	Tokai Works	5,535	843	6,378	6.35
	Kumatori Works	7,696	494	8,190	13.2
JAEA	Prototype Uranium Enrichment Plant	531	56	587	0
JNFL	Enrichment and Disposal Office	5,191	1,472	6,703	2.17
Total		44,903	6,021	50,963	23.616

Unit: 200-liter drum, including values equivalent to 200 liters per drum

L2-5 Waste stored in research facilities

This table shows streamlined data collected from a variety of reports. It includes data from FY2013 Radioactive Waste Management Status Reports, which were submitted based on the Periodic Report on Management of the Radioactive Waste (notice), issued by the director of the Nuclear Safety Division, Science and Technology Policy Bureau, MEXT; data from FY2013 reports submitted pursuant to the provisions of Article 67 (1) of the Act on the Regulation of Nuclear Source Material, Nuclear Fuel Material

and Reactors, and data from the FY2013 Radioactive Waste Management Status Reports, which were submitted by the licensees pursuant to the provisions of Article 42 (1) of the Act concerning Prevention from Radiation Hazards due to Radioisotopes, etc.(Radiation Hazards Prevention Act), as well as Article 39 (3) of the Ordinance for Enforcement of said Act.

Waste stored by licensees of research reactor operations and those of nuclear reactor facilities used for research, excluding power reactors used for power generation, and those stored by users of nuclear fuel materials related to usage facilities of such materials pursuant to Article 41 of the Ordinance for Enforcement of the Act on the Regulation of Nuclear Source Material, Nuclear Fuel Material and Reactors				
Name of facility		Solid waste (drum*[1])	Liquid waste (m^3)	Remarks
JAEA	Nuclear Science Research Institute	128,442	-	Sum of values for reactor facilities and those for facilities using nuclear fuel materials
	Nuclear Fuel Cycle Engineering Laboratories	63,316	25.9	Facility using nuclear fuel materials
	Oarai Research and Development Center (North Area)	1,478	-	Sum of values for reactor facilities and those for facilities using nuclear fuel materials
		29,634	-	Waste storage facility
	Oarai Research and Development Center (South Area)	145	0.03	For solid wastes, values refer to those for reactor facilities (for temporary storage). For liquid wastes, values refer to facilities using nuclear fuel materials.
	Ningyo-toge Environmental Engineering Center	14,919	10.5	Facility using nuclear fuel materials
	Mutsu Office, Aomori Research and Development Center	1,070	22.0	Reactor facility
Nuclear Professional School, School of Engineering, the University of Tokyo		33	2.7	For solid wastes, values refer to the sum of those for reactor facilities and those for facilities using nuclear for temporary storage. For liquid wastes, values refer to those for reactor facilities.

Research Reactor Institute, Kyoto University		73	0.0	The values refer to the sum of reactor facilities and for facilities using nuclear fuel materials.
National Institute of Radiological Sciences		1,269	-	Facility using nuclear fuel materials
Nuclear Material Control Center	Tokai Safeguards Center	468	-	Facility using nuclear fuel materials
	Rokkasho Safeguards Analytical Laboratory	324	-	Facility using nuclear fuel materials
Institute for Atomic Energy, Rikkyo University		15	0	Reactor facility
Atomic Energy Research Institute, Tokyo City University (former Musashi Institute of Technology)		5	-	Reactor facility
Atomic Energy Research Institute, Kinki University		3	-	Reactor facility
Nuclear Fuel Industries, Ltd. Tokai Works		6,378	6.35	Facility using nuclear fuel materials (reposting of the values in Table L2.4 as a fabricating facility)
Nippon Nuclear Fuel Development Co., Ltd.		311	10.5	Facility using nuclear fuel materials
Nuclear Development Corporation		1,887	-	Facility using nuclear fuel materials
Toshiba Corporation	Research Reactor Center	74	-	Reactor facility
	Nuclear Engineering Lab.	1,605	0.7	For solid wastes, the values refer to the sum of reactor facilities and facilities using nuclear fuel materials. For liquid wastes, the values refer to facilities using nuclear fuel materials.
Ozenji Hitachi Training Reactor Center, Power & Industrial Systems Nuclear System Division, Hitachi, Ltd.		496	-	Reactor facility
Total		251,945	78.68	-
Waste stored by licensees who are connected to facilities that use nuclear fuel materials but do not fall under those stipulated in Article 41 of the Act on the Regulation of Nuclear Source Material, Nuclear Fuel Material and Reactors				

(195 facilities)	76,866 drums *1	Sum of values of solid and liquid waste materials

Note: The data in this table includes those of long half-life low heat generating radioactive waste and uranium waste generated in the facilities.

*1: Unit: 200-liter drum, including values equivalent to 200 liters per drum.

Wastes stored by a licensee of waste management pursuant to Article 4 (1) of Radiation Hazards Prevention Act			
Name of facility		Amount of waste (drum*)	Remarks
Japan Radioisotope Association	Kanto Waste Relay Station II	8,501	
	Ichihara Office	66,818	
	Kansai Waste Relay Station	0	
Vesta Co., Ltd.		56,573	
JAEA	Nuclear Science Research Institute	99,890	This data is also reported pursuant to the Act on the Regulation of Nuclear Source Material, Nuclear Fuel Material and Reactors.
	Oarai Research and Development Center	33,598	This data is also reported pursuant to the Act on the Regulation of Nuclear Source Material, Nuclear Fuel Material and Reactors.
Tsukuba Laboratory, T.N. Technos Co., Ltd.		317	
Total		266,932	

* Unit: 200-liter drum, including values equivalent to 200 liters per drum; this data includes values for liquid waste.

L3 List of spent fuel storage facilities and radioactive waste storage facilities

L3-1 List of spent fuel management facilities

(1) Facilities related to power reactors

Facilities in which spent fuel management facilities are located	Location	Major purpose	Major feature

Tokai No. 2 Power Station, JAPCO	Ibaraki Prefecture	Storing spent fuel	Wet storage (partially stored in dry cask storage)
Tsuruga Power Station, JAPCO	Fukui Prefecture	Storing spent fuel	Wet storage
Hokkaido Prefecture Tomari Power Station, Hokkaido Electric Power Co., Inc.	Hokkaido Prefecture	Storing spent fuel	Wet storage
Onagawa Nuclear Power Station, Tohoku Electric Power Co., Inc.	Miyagi Prefecture	Storing spent fuel	Wet storage
Higashidori Nuclear Power Station, Tohoku Electric Power Co., Inc.	Aomori Prefecture	Storing spent fuel	Wet storage
Fukushima Daiichi Nuclear Power Plant, TEPCO	Fukushima Prefecture	Storing spent fuel	Wet storage (partially stored in dry cask storage)
Fukushima Daini Nuclear Power Plant, TEPCO	Fukushima Prefecture	Storing spent fuel	Wet storage
Kashiwazaki-Kariwa Nuclear Power Plant, TEPCO	Niigata Prefecture	Storing spent fuel	Wet storage
Hamaoka Nuclear Power Station, Chubu Electric Power Co., Inc.	Shizuoka Prefecture	Storing spent fuel	Wet storage
Shika Nuclear Power Station, Hokuriku Electric Power Co., Inc.	Ishikawa Prefecture	Storing spent fuel	Wet storage
Mihama Power Station, the Kansai Electric Power Co., Inc.	Fukui Prefecture	Storing spent fuel	Wet storage
Takahama Power Station, the Kansai Electric Power Co., Inc.	Fukui Prefecture	Storing spent fuel	Wet storage
Ohi Power Station, the Kansai Electric Power Co., Inc.	Fukui Prefecture	Storing spent fuel	Wet storage
Shimane Nuclear Power Station, the Chugoku Electric Power Co., Inc.	Shimane Prefecture	Storing spent fuel	Wet storage
Ikata Power Station, Shikoku Electric Power Co., Inc.	Ehime Prefecture	Storing spent fuel	Wet storage
Genkai Nuclear Power Station, Kyushu Electric Power Co., Inc.	Saga Prefecture	Storing spent fuel	Wet storage
Sendai Nuclear Power Station, Kyushu Electric Power Co., Inc.	Kagoshima Prefecture	Storing spent fuel	Wet storage
Advanced Thermal Reactor *Fugen*, Fugen Reactor Decommissioning R&D Center,	Fukui Prefecture	Storing spent fuel	Wet storage

JAEA			
Reprocessing Facility of the Nuclear Fuel Cycle Engineering Laboratories, Tokai Research and Development Center, JAEA	Ibaraki Prefecture	Storing spent fuel	Wet storage
Rokkasho Reprocessing Plant, JNFL	Aomori Prefecture	Storing spent fuel	Wet storage
Fast Breeder Reactor *Monju,* FBR Research and Development Center, JAEA	Fukui Prefecture	Storing spent fuel	Wet storage

(2) List of spent fuel management facilities (related to research and test reactors)

Facilities in which spent fuel management facilities are located	Location	Major purpose	Major feature
Nuclear Science Research Institute of the Tokai Research and Development Center, JAEA	Ibaraki Prefecture	Storing spent fuel	Wet storage (partially stored in dry cask storage)
Oarai Research and Development Center, JAEA	Ibaraki Prefecture	Storing spent fuel	Wet storage
Research Reactor Institute, Kyoto University	Osaka Prefecture	Storing spent fuel	Wet storage

L3-2 List of radioactive waste management facilities

(1) Facilities related to power reactors

Facilities in which radioactive waste management facilities are located	Location	Major purpose	Major feature
Tokai Power Station, JAPCO	Ibaraki Prefecture	Disposing and storing waste from power reactors	Storing waste after reducing the volume by compressing or incineration
Tokai No. 2 Power Station, JAPCO	Ibaraki Prefecture	Disposing and storing waste from power reactors	Storing waste after reducing the volume by compressing or incineration
Tsuruga Power Station, JAPCO	Fukui Prefecture	Disposing and storing waste from power reactors	Storing waste after reducing the volume by compressing or

			incineration
Tomari Power Station, Hokkaido Electric Power Co., Inc.	Hokkaido Prefecture	Disposing and storing waste from power reactors	Storing waste after reducing the volume by compressing or incineration
Higashidori Nuclear Power Station, Tohoku Electric Power Co., Inc.	Aomori Prefecture	Disposing and storing waste from power reactors	Storing waste after reducing the volume by compressing or incineration
Onagawa Nuclear Power Station, Tohoku Electric Power Co., Inc.	Miyagi Prefecture	Disposing and storing waste from power reactors	Storing waste after reducing the volume by compressing or incineration
Fukushima Daiichi Nuclear Power Station, TEPCO	Fukushima Prefecture	Disposing and storing waste from power reactors	Storing waste after reducing the volume by compressing or incineration
Fukushima Daini Nuclear Power Station, TEPCO	Fukushima Prefecture	Disposing and storing waste from power reactors	Storing waste after reducing the volume by compressing or incineration
Kashiwazaki-Kariwa Nuclear Power Station, TEPCO	Niigata Prefecture	Disposing and storing waste from power reactors	Storing waste after reducing the volume by compressing or incineration
Hamaoka Nuclear Power Station, Chubu Electric Power Co., Inc.	Shizuoka Prefecture	Disposing and storing waste from power reactors	Storing waste after reducing the volume by compressing or incineration
Shika Nuclear Power Station, Hokuriku Electric Power Co., Inc.	Ishikawa Prefecture	Disposing and storing waste from power reactors	Storing waste after reducing the volume by compressing or incineration
Mihama Power Station, the Kansai Electric Power Co., Inc.	Fukui Prefecture	Disposing and storing waste from power reactors	Storing waste after reducing the volume by compressing or incineration

Takahama Power Station, the Kansai Electric Power Co., Inc.	Fukui Prefecture	Disposing and storing waste from power reactors	Storing waste after reducing the volume by compressing or incineration
Ohi Power Station, the Kansai Electric Power Co., Inc.	Fukui Prefecture	Disposing and storing waste from power reactors	Storing waste after reducing the volume by compressing or incineration
Shimane Nuclear Power Station, the Chugoku Electric Power Co., Inc.	Shimane Prefecture	Disposing and storing waste from power reactors	Storing waste after reducing the volume by compressing or incineration
Ikata Power Station, Shikoku Electric Power Co., Inc.	Ehime Prefecture	Disposing and storing waste from power reactors	Storing waste after reducing the volume by compressing or incineration
Genkai Nuclear Power Station, Kyushu Electric Power Co., Inc.,	Saga Prefecture	Disposing and storing waste from power reactors	Storing waste after reducing the volume by compressing or incineration
Sendai Nuclear Power Station, Kyushu Electric Power Co., Inc.,	Kagoshima Prefecture	Disposing and storing waste from power reactors	Storing waste after reducing the volume by compressing or incineration
Advanced Thermal Reactor *Fugen*, Fugen Reactor Decommissioning R&D Center, JAEA	Fukui Prefecture	Disposing and storing waste from power reactors	Storing waste in storage after reducing the volume by compressing or incineration
Prototype fast-breeder reactor *Monju*, FBR Research and Development Center, JAEA	Fukui Prefecture	Disposing and storing waste from power reactors	Storing waste after reducing the volume by compressing

(2) List of radioactive waste management facilities (excluding those related to power reactors)

Facilities in which radioactive waste management facilities are located*		Location	Major purpose	Major feature
Global Nuclear	Facility for	Kanagawa	Disposing and storing	Storing waste after

Fuel-Japan Co., Ltd.	fabricating nuclear fuel materials	Prefecture	uranium waste	reducing the volume by compressing
Mitsubishi Nuclear Fuel Co., Ltd.	Facility for fabricating nuclear fuel materials	Ibaraki Prefecture	Disposing and storing uranium waste	Storing waste after reducing the volume by compressing or incineration
Nuclear Fuel Industries, Ltd. Tokai Works	Facility for fabricating nuclear fuel materials	Ibaraki Prefecture	Disposing and storing uranium waste	Storing waste after reducing the volume by incineration
	Facility for fabricating nuclear fuel materials		Disposing and storing waste from facilities using nuclear fuel materials	Storing waste after reducing the volume by incineration
Nuclear Fuel Industries, Ltd. Kumatori Works	Facility for fabricating nuclear fuel materials	Osaka Prefecture	Disposing and storing uranium waste	Storing waste after reducing the volume by compressing
	Facility using nuclear fuel materials		Storing waste from facilities using nuclear fuel materials	Storing waste after reducing the volume by compressing
Ningyo-toge Environmental Engineering Center, JAEA	Facility for fabricating nuclear fuel materials	Okayama Prefecture	Disposing and storing uranium waste	Storing waste after reducing the volume by incineration
	Facility using nuclear fuel materials		Disposing and storing waste from facilities using nuclear fuel materials	Storing waste after reducing the volume by incineration
Nuclear Science Research Institute of the Tokai Research and Development Center, JAEA	Waste disposal facility	Ibaraki Prefecture	Disposing low-level radioactive waste materials	Trench disposal of concrete waste
	Research and test reactor facility (under operation: 7; under decommissioning: 1), facility using nuclear fuel materials, and facility		Disposing and storing waste from research and test reactor facilities using nuclear fuel materials, and facilities using radioisotope	Storing waste after reducing the volume by compressing or incineration

	managed by disposal service businesses*[1]			
Nuclear Fuel Cycle Engineering Laboratories, Tokai Research and Development Center, JAEA	Reprocessing facility	Ibaraki Prefecture	Disposing and storing high-level radioactive waste and waste containing trans uranium	Storing high-level radioactive waste and waste containing trans-uranium after reducing volume by solidifying high-level radioactive waste with glass or incinerating the waste containing trans uranium
	Facility using nuclear fuel materials		Disposing and storing waste from facilities using nuclear fuel materials	Storing waste after reducing the volume by compressing or incineration
Oarai Research and Development Center, JAEA	Research and reactor facilities (under operation: 3; under decommissioning: 1), waste storage facility, facility using nuclear fuel materials, and facility managed by disposal service businesses *[1]	Ibaraki Prefecture	Disposing and storing waste from research and test reactor facilities, facilities using nuclear fuel materials, and facilities using radioisotope	Storing waste after reducing the volume by compressing or incineration
Mutsu Office, Aomori Research and Development Center, JAEA	Research and test reactor facility (under decommissioning: 1)	Aomori Prefecture	Disposing and storing waste from research and test reactor facilities	Storing waste after reducing the volume by compressing
Reprocessing facility, JNFL	Reprocessing facility	Aomori Prefecture	Disposing and storing high-level radioactive waste and waste containing trans uranium	Storing waste from storage facilities that accept spent fuel materials (a reprocessing facility is now under

				construction)
	Waste storage facility		Storing vitrified waste	Facilities for storing returned vitrified waste
Enrichment and Disposal Office, JNFL	Waste disposal facility	Aomori Prefecture	Disposing low-level radioactive waste materials	Waste disposal facilities Units 1 and 2
	Facility for uranium enrichment		Disposing and storing uranium waste	Storing waste
Nuclear Professional School, School of Engineering, the University of Tokyo	Research and test reactor facility, facility using nuclear fuel materials	Ibaraki Prefecture	Temporarily storing waste from the research and test reactor facilities and facilities using nuclear fuel materials	Commissioned to the Nuclear Science Research Institute of the Tokai Research and Development Center, JAEA
Radioisotope Center, the University of Tokyo	Facility managed by disposal service businesses *[1]	Tokyo	Disposing and storing waste from facilities using radioisotope	Storing waste after reducing the volume by incineration
Research Reactor Institute, Kyoto University	Research and test reactor facility (under operation: 2), facility using nuclear fuel materials	Osaka Prefecture	Disposing and storing waste from research and test reactor facilities and facilities using nuclear fuel materials	Storing waste
Institute for Atomic Energy, Rikkyo University	Research and test reactor facility (under decommissioning: 1)	Kanagawa Prefecture	Disposing and storing waste from research and test reactor facilities	Storing waste
Atomic Energy Research Institute, Tokyo City University (former Musashi Institute of Technology)	Research and test reactor facility (under decommissioning: 1)	Kanagawa Prefecture	Storing waste from research and test reactor facilities	Storing waste
Atomic Energy Research Institute, Kinki University	Research and test reactor facility	Osaka Prefecture	Storing waste from research and test reactor facilities	Storing waste

Radiotoxicology Experiment Building, National Institute of Radiological Science	Facility using nuclear fuel materials	Chiba Prefecture	Storing waste from facilities using nuclear fuel materials	Storing waste
Tsukuba Center No. 2 Office, AIST	Facility using nuclear fuel materials	Ibaraki Prefecture	Storing waste from facilities using nuclear fuel materials	Storing waste
On Site Laboratory, Rokkasho Safeguards Analytical Laboratory, Nuclear Material Control Center	Facility using nuclear fuel materials	Aomori Prefecture	Disposing and storing waste from facilities using nuclear fuel materials	Storing waste
Tokai Safeguards Center, Nuclear Material Control Center	Facility using nuclear fuel materials	Ibaraki Prefecture	Storing waste from facilities using nuclear fuel materials	Storing waste in storage
The Kaya Memorial Takizawa Laboratory, Japan Radioisotope Association	Facility managed by disposal service businesses*[2]	Iwate Prefecture	Disposing and storing waste from facilities using radioisotope	Storing waste after reducing the volume by compressing or incineration
Ichihara Office, Japan Radioisotope Association	Facility managed by disposal service businesses *[2]	Chiba Prefecture	Storing waste from facilities using radioisotope	Storing waste
Kanto Waste Relay Station 2, Japan Radioisotope Association	Facility managed by disposal service businesses *[2]	Chiba Prefecture	Storing waste from facilities using radioisotope	Storing waste
Kansai Waste Relay Station, Japan Radioisotope Association	Facility managed by disposal service businesses*[2]	Osaka Prefecture	Storing waste from facilities using radioisotope	Storing waste sto
Research Reactor Center, Toshiba Corporation	Research and test reactor facility (under decommissioning: 1)	Kanagawa Prefecture	Storing waste from the research and test reactor facilities	Storing waste
Nuclear Engineering Lab., Toshiba	Facility using nuclear fuel	Kanagawa Prefecture	Storing waste from research and test	Storing waste

Corporation	materials, research and test reactor facility		reactor facilities and facilities using nuclear fuel materials	
Ozenji Hitachi Training Reactor Center, Power & Industrial Systems Nuclear System Division, Hitachi, Ltd.	Research and test reactor facility (under decommissioning: 1)	Kanagawa Prefecture	Storing waste from the research and test reactor facilities	Storing waste
NFD Hot Laboratory, Nippon Nuclear Fuel Development Co., Ltd.	Facility using nuclear fuel materials	Ibaraki Prefecture	Disposing and storing waste from facilities using nuclear fuel materials	Commissioned to Oarai Research and Development Center, JAEA
Fuel Hot Laboratory, Nuclear Development Corporation	Facility using nuclear fuel materials	Ibaraki Prefecture	Disposing and storing waste from facility using nuclear fuel materials	Storing waste after reducing the volume by compressing
Tsukuba Laboratory, T.N. Technos Co., Ltd.	Facility managed by disposal service businesses *[1]	Ibaraki Prefecture	Disposing and storing waste from facilities using radioisotope	Storing waste after reducing the volume by incineration
Vesta Co., Ltd.	Facility managed by disposal service businesses *[1]	Chiba Prefecture	Disposing and storing waste from facilities using radioisotope	Storing waste after reducing the volume by incineration

* One licensee operates one facility unless otherwise noted. When one licensee operates more than one facility or implements decommissioning measures for more than one facility, that situation will be clearly described.

*1: Facilities managed by disposal service businesses refer to those approved pursuant to Radiation Hazards Prevention Act .

*2: Facilities managed by disposal service businesses refer to those approved pursuant to the Radiation Hazards Prevention Act and the Medical Care Act.

Amount of disposed radioactive waste

Name of facility		Major nuclides to be confirmed	Amount (drums)
Waste Disposal Facilities, Enrichment and Disposal Office, JNFL	Unit 1	Co-60, Ni-63, Cs-137, Sr-90, C-14	147,507*[2]
	Unit 2	Co-60, Ni-63, Cs-137, Sr-90, C-14	112,672*[2]
	Total	-	260,179*[2]

Nuclear Science Research Institute of the Tokai Research and Development Center, JAEA *[1]	Waste disposal facilities	Co-60, Ni-63, Cs-137, Sr-90, Ca-41, C-14, Eu-152, H-3	1,670 tons

*1: Disposing very low-level concrete waste generated by dismantling the JPDR, the decommissioning of which has been transferred to the phase of preserving the disposal site since October 1997

*2: Unit: 200-liter drum

L3-3 Nuclear facilities undergoing decommissioning

(1) Facilities related to power reactors

Name of facility	Location	Type of reactor	Power output (10MW)	Period of commercial operation	Current state of decommissioning
Tokai Power Station, JAPCO	Ibaraki Prefecture	GCR	16.6	Jul. 1966 - Mar. 1998	Decommissioning measures started in 2001
Advanced Thermal Reactor *Fugen*, Fugen Reactor Decommissioning R&D Center, JAEA	Fukui Prefecture	ATR	16.5	Mar. 1979 - Mar. 2003	Finished initial operation in March 2003; spent fuel continues to be removed and decommissioning continues from February 2008 to FY2033 as scheduled
Units 1 and 2, Hamaoka Nuclear Power Station, Chubu Electric Power Co., Inc.	Shizuoka Prefecture	BWR	54.0 84.0	Mar. 1976 - Jan. 2009; Nov. 1978 - Jan. 2009	Finished operation in January 2009; received approval for a decommissioning plan in November 2009; removing spent fuel during the first phase of the decommissioning preparation period, while starting the research and study on contamination and decontaminating the systems, as well as dismantling and removing facilities and equipment outside the radiation controlled area; decommissioning scheduled for completion during the 2030s

(2) Nuclear facilities under decommissioning measures; Nuclear facilities scheduled to be decommissioned; Current situation of the decommissioning measures (research reactors facilities)

Name of facility	Location	Type of reactor	Thermal output (kW)	Period of operation*	Current situation of the decommissioning measures
JRR-2 of the Nuclear Science Research Institute, Tokai Research and Development Center, JAEA	Ibaraki Prefecture	Heavy-water-moderated cooling tank reactor	10,000	Oct. 1960 - Dec. 1996	Removed heavy water; segregated reactor cooling systems; sealed the body of the nuclear reactor; removed the secondary cooling facilities; removed experimental facilities; moved the spent fuel
Nuclear ship *Mutsu* (the first Japanese nuclear ship), Mutsu Office, Aomori Research and Development Center, JAEA	Aomori Prefecture	Pressurized light-water moderated and cooled reactor; PWR	36,000	Aug. 1974 - Feb. 1992	Completed dismantling the ship; maintaining and managing the accessory onshore facilities to store solid waste and dispose of liquid waste
Deuterium Criticality Assembly (DCA), Oarai Research and Development Center, JAEA	Ibaraki Prefecture	Heavy-water moderated reactor	1	Dec. 1969 - Sep. 2001	Completed shut down of the reactor functions; removed heavy water; removed the cooling systems
Ozenji Hitachi Training Reactor (HTR) Center, Power & Industrial Systems Nuclear System Division, Hitachi, Ltd.	Kanagawa Prefecture	Light-water moderated and cooled reactor	100	Dec. 1961 - Feb. 1975	Dismantled and removed the body of the nuclear reactor, followed by solidifying the reactor vessel with concrete; removed the spent fuel
Training Reactor (TTR-1), Research Reactor Center, Toshiba Corporation	Kanagawa Prefecture	Light-water moderated unhomogeneous reactor	100	Mar. 1962 - Jan. 2001	Conducted permanent shutdown of operational functions; removed facilities for reactor cooling systems; removed the

					spent fuel
Research and test reactor (RUR), Institute for Atomic Energy, Rikkyo University	Kanagawa Prefecture	Zirconium hydride moderated light-water cooled reactor	100	Dec. 1961 - Dec. 2001	Conducted shutdown of the reactor functions; removed the spent fuel
Research and test reactor, Atomic Energy Research Institute (MITRR), Tokyo City University (former Musashi Institute of Technology)	Kanagawa Prefecture	Zirconium hydride moderated light-water cooled reactor	100	Jan. 1963 - Jan. 2004	Conducted shutdown of the reactor functions; removed the spent fuel
Nuclear reactor *Yayoi* of the University of Tokyo	Ibaraki Prefecture	Air cooling fast reactor using uranium as fuel	2	Apr. 1971 - Mar. 2011	Finished reactor operations on March 31, 2011; scheduled to advance the decommissioning procedures

* The term period of operation refers to the period from reaching the first critical state to shutting down the operation.

L4 Excerpt of Regulations Relevant to Sections G and H

I. Excerpt of Regulations Relevant to Section G

Table G1-1 Ordinance on Activity of Interim Storage of Spent Fuel (Excerpt)

(Application for Permission for Spent Fuel Interim Storage Activity)

Article 2

(1) An application form for permission for the interim storage of spent fuel set forth in Article 43-4, paragraph (2) of the Act on the Regulation of Nuclear Source Material, Nuclear Fuel Material and Reactors (hereinafter referred to as the "Act") shall include the following:

(i) with regard to the storage capacity set forth in Article 43-4, paragraph (2), item (iii) of the Act, entering the maximum storage capacity for each type of spent fuel to be stored;

(ii) with regard to the location, structure and equipment of the spent fuel interim storage facilities set forth in Article 43-4, paragraph (2), item (iv) of the Act, entering data in accordance with the following classification:

a. to h. (omitted)

(iii) with regard to the storage method set forth in Article 43-4, paragraph (2), item (iv) of the Act, entering data in accordance with the following classification:

a. and b. (omitted)

(iv) with regard to the construction plan for the spent fuel interim storage facilities set forth in Article 43-4, paragraph (2), item (v) of the Act, entering the sequence and schedule of the construction work;

(v) with regard to the method for shipping spent fuel after the termination of interim storage set forth in Article 43-4, paragraph (2), item (vi) of the Act, entering the name of the party to which said spent fuel is to be returned and the method thereof.

(2) A written business plan and other documents specified by the Ordinance of the Nuclear Regulation Authority (hereinafter referred to as the "Ordinance of the NRA") as prescribed in Article 22, paragraph (2) of the Order for Enforcement of the Act on the Regulation of Nuclear Source Material, Nuclear Fuel Material and Reactors (hereinafter referred to as the "Order") shall be attached to the application form set forth in the preceding paragraph and shall be as follows:

(i) to (viii) (omitted)

(3) One original copy and one duplicate copy of the application form set forth in paragraph (1) shall be submitted.

(Application for Approval for Design and Construction Methods)

Article 4

(1) A person who seeks approval for the design and construction methods of spent fuel interim storage facilities (excluding a welding method pertaining to spent fuel interim storage facilities as

prescribed in Article 11 for which welding is to be performed; hereinafter the same applies in this Article and the following Article) pursuant to the provisions of Article 43-8, paragraph (1) of the Act shall submit an application form containing the following matters:

(i) to (v) (omitted)

(2) Documents explaining computationally that the design and construction methods pertaining to said application conform with the technical standards set forth in Article 43-8, paragraph (3), item (ii) of the Act (hereinafter referred to as the "technical standards" in this Article and the following Article), and other documents explaining that quality control methods conform to the technical standards set forth in item (iii) of said paragraph.

(3) When it is impossible to file at one time an application for approval under Article 43-8, paragraph (1) of the Act regarding the design and construction methods as a whole, the applicant may file an application splitting the design and construction methods and explaining the reason why.

(4) One original copy of the application form set forth in paragraph (1) shall be submitted.

(Application for Pre-service Inspection)

Article 7

(1) A person who intends to undergo an inspection with regard to the construction work of the spent fuel interim storage facilities (excluding a welding method pertaining to spent fuel interim storage facilities as prescribed in Article 11 for which welding is to be performed) and the performance thereof pursuant to the provisions of Article 43-9, paragraph (1) of the Act shall submit an application form containing the following matters:

(i) to (v) (omitted)

(2) When the person has changed any application details in the preceding paragraph, he/she shall promptly notify the appropriate authorities.

(3) One original copy of the application set forth in paragraph (1) and the notification highlighted in the preceding paragraph shall be submitted.

(Implementation of Pre-service Inspection)

Article 8 A Pre-service Inspection set forth in Article 43-9, paragraph (1) of the Act shall be conducted covering the following items and at times respectively prescribed therein:

(i) matters concerning materials or components relating to the prevention of criticality of spent fuel, radiation shielding, confinement of spent fuel, and heat removal from spent fuel: during chemical analysis tests, non-destructive tests, mechanical tests, pressure tests, or leakage tests or at any other time that the Nuclear Regulation Authority finds appropriate;

(ii) matters concerning the assembly of the main body of the spent fuel interim storage equipment, facilities for accepting spent fuel, or radioactive waste disposal facilities: when the sizes of major parts of the respective facilities can be measured, or during non-destructive tests, mechanical tests, pressure tests, or leakage tests, or at any other time that the Nuclear Regulation

Authority finds appropriate;

(iii) matters concerning the assembly of measurement and control facilities, radiation control facilities or other auxiliary facilities of the spent fuel interim storage equipment: when the relevant facilities are completed;

(iv) matters concerning the performance of the spent fuel interim storage facilities: when containers in which spent fuel is encapsulated are installed, when the spent fuel interim storage facilities are completed, or at any other time that the Nuclear Regulation Authority finds appropriate.

(Spent Fuel Interim Storage Facilities Subject to Welding Inspection)

Article 11 Spent fuel interim storage facilities specified by the NRA Ordinance set forth in Article 43-10, paragraph (1) of the Act are as follows:

(i) vessels belonging to the main body of the spent fuel interim storage equipment, disposal facilities, radiation control facilities or other auxiliary facilities of the spent fuel interim storage equipment; or pipes with an outside diameter exceeding 61mm (for pipes whose maximum operating pressure is less than 98kPa, with an outside diameter exceeding 100mm) that belong to these facilities, both of which contain radioactive material with a concentration of 37mBq/cm3 or more (where said radioactive material is in liquid form, 37kBq/cm3 or more);

(ii) vessels of the main body of the spent fuel interim storage equipment, disposal facilities, radiation control facilities or other auxiliary facilities of the spent fuel interim storage equipment; pipes with an outside diameter of 150mm or more which contain radioactive material with a concentration of less than 37mBq/cm3 (where said radioactive material is in liquid form, less than 37kBq/cm3) and whose parts to which pressures as specified as follows or larger are applied (hereinafter referred to as the "pressure parts") need to be welded:

(a) for vessels or water pipes whose maximum operating temperature is lower than 100°C, a maximum operating pressure of 1960kPa;

(b) for vessels other than those prescribed in (a) above, a maximum operating pressure of 98kPa or more;

(c) for pipes other than those prescribed in (a) above, a maximum operating pressure of 980kPa (for longitudinal joints, a maximum operating pressure of 490kPa).

(Application for Welding Inspection)

Article 12

(1) A person who intends to undergo an inspection with regard to welding of the spent fuel interim storage facilities pursuant to the provisions of Article 43-10, paragraph (1) of the Act shall submit an application form containing the following information to the Nuclear Regulation Authority:

(i) to (v) (omitted)

(2) The following documents shall be attached to an application form as set forth in the preceding paragraph:

(i) to (iii) (omitted)

(3) When any information in the application form set forth in paragraph (1) or in the documents set forth in the preceding paragraph has been changed, the applicant shall promptly notify the appropriate authority.

(4) One original copy of the application set forth in paragraph (1) and the document from the preceding paragraph shall be submitted.

(Implementation of Welding Inspection)

Article 13 A welding inspection as set forth in Article 43-10, paragraph (1) of the Act shall be conducted for each of the following processes:

(i) when any welding is performed (excluding situations pertaining to seal welding for vessels or pipes set forth in Article 11, item (ii) and situations where the NRA approves the use of the facilities, recognizing that such use will not pose any problem because of the standardization of welding operation and materials used for welding.);

(ii) with regard to welded parts for which a non-destructive test is required to confirm compliance with the technical standards prescribed in Article 43-10, paragraph (3), item (ii) of the Act (hereinafter referred to as the "technical standards for welding"): when it becomes possible to carry out such a non-destructive test;

(iii) with regard to welded parts for which a mechanical test is required to confirm compliance with the technical standards for welding: when it has become possible to carry out such a mechanical test;

(iv) when it has become possible to carry out a pressure test or leakage test to confirm compliance with the technical standards for welding (excluding the cases pertaining to seal welding for vessels or pipes set forth in Article 11, item (ii)).

(Approval for Welding Method)

Article 15

(1) A person who intends to obtain approval as set forth in Article 43-10, paragraph (2) of the Act shall submit an application form containing the following information with regard to each welding situation:

(i) to (v) (omitted)

(2) Documents explaining the following matters shall be attached to an application form as set forth in the preceding paragraph:

(i) to (iii) (omitted)

(3) When the Nuclear Regulation Authority finds that the welding method submitted conforms with all of the following, it shall grant the application approval set forth in said paragraph:

(i) the type and capacity of the welding equipment are appropriate for the welding method contained in the application;

(ii) the welding method is appropriate for ensuring the strength and corrosion resistance of the welded parts;

(iii) a designated welder has the requiste skills to perform the task at hand.

(4) One original copy of the application form set forth in paragraph (1) shall be submitted.

(Welding Inspection of Imported Goods)

Article 16

(1) A person who intends to undergo an inspection with regard to welding of imported equipment for spent fuel interim storage for which he/she performed the welding pursuant to the provisions of Article 43-10, paragraph (4) of the Act shall submit an application form containing the following information to the NRA:

(i) to (iv) (omitted)

(2) The following documents shall be attached to an application form as set forth in the preceding paragraph:

(i) to (iv) (omitted)

(3) When any information has been changed in the application form set forth in paragraph (1) or the documents set forth in the preceding paragraph, the appropriate authority will be promptly notified.

(4) One original copy of the application (paragraph (1) and documents in the preceding paragraph shall be submitted.

(Application for Periodic Facility Inspection)

Article 19

(1) A person who intends to undergo an inspection with regard to the performance of the spent fuel interim storage facilities pursuant to the provisions of Article 43-11, paragraph (1) of the Act shall submit an application form containing the following information:

(i) to (iii) (omitted)

(2) When the person has changed any details in the application form set forth in the preceding paragraph, he/she shall make a notification to that effect promptly.

(3) One original copy of the application (paragraph (1) and documents outlined in the preceding paragraph shall be submitted.

(Implementation of Periodic Facility Inspection)

Article 20 The interval specified by the NRA Ordinance set forth in Article 43-11, paragraph (1) of the Act shall be one year.

(Storage Plan)

Article 23

(1) A storage plan of the spent fuel interim storage facilities under Article 43-13 of the Act shall be

drawn up for each item of the spent fuel interim storage equipment in Form 1. A three-year storage plan (starting from April 1 of the relevant year to March 31 of the following year; the same applies hereinafter) shall be submitted every fiscal year. It will start from the fiscal year when a facility is scheduled to begin operations and will submitted no later than January 31 of the preceding fiscal year.

(2) Notwithstanding the provisions of the preceding paragraph, in the case where permission under Article 43-4, paragraph (1) of the Act or permission for a change under Article 43-7, paragraph (1) of the Act is obtained during the period between February 1 of the preceding fiscal year and March 31 of the relevant fiscal year and storage is to be commenced within said period, a storage plan shall be submitted promptly after obtaining said permission.

(3) When there are any changes in the storage plan set forth in the preceding two paragraphs, an applicant will draw up a new storage plan highlighting each change of the spent fuel interim storage equipment in Form 1 and submit it within 30 days of any said change.

(4) One original copy of the storage plan set forth in the preceding three paragraphs shall be submitted.

(Quality Assurance)

Article 28 Pursuant to the provisions of Article 43-18, paragraph (1) of the Act, a licensee of spent fuel interim storage activity shall draw up a quality assurance plan based on the Operational Safety Programs, and shall organize, carry out, evaluate and constantly improve operational safety activities (including measures prescribed in Article 29 to Article 35-2).

(Quality Assurance Plan)

Article 28-2 A quality assurance plan shall specify the following issues:

(i) the organization for conducting quality assurance;
(ii) plans for operational safety activities;
(iii) implementation of operational safety activities;
(iv) evaluation of operational safety activities;
(v) improvements in operational safety activities.

(Organization for Conducting Quality Assurance)

Article 28-3 An organization for conducting quality assurance shall be as follows:

(i) the organization is operated by a licensee of spent fuel interim storage activity (in the case of a corporation, its representative);
(ii) the responsibility, authority, and duties concerning quality assurance are clarified;
(iii) the organization has prepared a mechanism to draw up, implement and evaluate a quality assurance plan and make improvements to the plan on an on-going basis.

(Plans for Operational Safety Activities)

Article 28-4 plans for operational safety activities to be specified in a quality assurance plan shall be as follows:

(i) the processes specified in Q9000 of the Japanese Industrial Standards based on the Industrial Standardization Act (Act No. 185 of 1949) and their correlation are clarified in operational safety activities;

(ii) quality assurance is conducted based on each stage of organizing, carrying out, evaluating, and improving operational safety activities on an on-going basis;

(iii) when procuring goods or services from third parties, the methods of managing them appropriately are specified;

(iv) the details of pending operational safety activities are specified in accordance with operational safety;

(v) procedures for document and records management concerning operational safety activities are specified;

(vi) an education and training system for personnel who carry out operational safety activities is specified.

(Implementation of Operational Safety Activities)

Article 28-5 Operational safety activities in a quality assurance plan shall be as follows:

(i) In individual operational safety activities (hereinafter referred to as "individual duties"), the following procedures are to be followed:

(a) drawing up an implementation plan for individual duties (hereinafter referred to as the "implementation plan" in this Article), and clarifying the goals and requirements;

(b) performing individual duties based on the implementation plan; in this case, it should be confirmed at an appropriate stage that said plan complies with the requirements;

(c) managing appropriately any amendments to the implementation plan

(ii) when procuring goods or services from third parties, the relevant person must specify appropriate measures including management methods (while also obtaining technical information on operational safety) to effectively maintain and operate said goods or services after procurement and to share such information with other licensees;

(iii) in order to confirm that individual duties comply with the implementation plan, necessary inspections and testing are to be carried out;

(iv) persons carrying out such inspections and testing are to be chosen in accordance with the significance for operational safety;

(v) In the event of a situation of non compliance (hereinafter referred to as "non-compliance"), appropriate management methods to handle such a situation are to be specified.

(Evaluation of Operational Safety Activities)

Article 28-6 The evaluation of operational safety activities in a quality assurance plan shall be as

follows:

(i) necessary monitoring and evaluation covering imlementation of operational safety activities will be conducted systematically;

(ii) a systematic audit will be conducted to ensure that the operational safety activities are being carried out appropriately;

(iii) Such an audit will be made by a person whose individual duties are not being evaluated.

(Improvements in Operational Safety Activities)

Article 28-7 Improvements in operational safety activities in a quality assurance plan shall be as follows:

(i) the improvements should include procedures to prevent any recurrence of non-compliance (including analysis for determining root causes of the incidents, such as accidents and failures set forth in the items of Article 43-13, and others (hereinafter referred to as "root cause analysis"));

(ii) the improvements should include procedures to prevent non-compliance (including procedures for root cause analysis);

(iii) in taking prevention action, operational safety knowledge obtained both at one's own spent fuel interim storage facility and other facilities should be included;

(iv) The results of the said evaluation should be reflected appropriately.

(Access to Radiation Controlled Areas)

Article 29 Pursuant to the provisions of Article 43-18, paragraph (1) of the Act, a licensee of spent fuel interim storage activity shall designate radiation controlled areas and peripheral monitoring areas and take the following measures:

(i) for radiation controlled areas:

(a) establishing clearly marked zoning areas with walls, fences, and other partitions with limited access or 'lock up' restrictions in accordance with radiation risks;

(b) prohibiting eating, drinking or smoking in areas where there is a risk of inhaling radioactive material;

(c) ensuring that the density of radioactive material on the surface of floors, walls and goods that people may come into contact with does not exceed the surface density limit specified by the Nuclear Regulation Authority;

(d) For persons leaving a controlled area, ensuring that the density of radioactive material on the surface of clothing, shoes and other items (wrapped or in containers) shall not exceed 10% of the surface density limit set forth in © above.

(ii) for peripheral monitoring areas, the following measures are to be taken:

(a) prohibiting people from living in those areas;

(b) installing fenses or boundary signs to limit access by unauthorized personnel (this should not apply in areas where it is clear people will not trespass).

(Measures concerning Doses,)

Article 30

(1) Pursuant to the provisions of Article 43-18, paragraph (1) of the Act, a licensee of spent fuel interim storage activity shall take the following measures, with regard to doses of radiation workers:

(i) ensuring that the doses of radiation workers do not exceed theNRA specified limits;

(ii) ensuring that the concentration of radioactive material in the air does not exceed the concentration limit specified by the Nuclear Regulation Authority.

(2) Irrespective of the provisions of the preceding paragraph, where it is urgent and unavoidable, such as where a disaster has occurred or may occur at a spent fuel interim storage facility, it may be permissible to employ workers in emergency tasks within a dose range that does not exceed limits specified by the Nuclear Regulation Authority. (female workers are limited to infertile women or those who have already notified the relevant licensee in writing of their intention to avoid pregnancy).

(Patrol and Checking of Spent Fuel Interim Storage Facilities)

Article 31

(1) Pursuant to Article 43-18, paragraph (1) of the Act, a licensee of spent fuel interim storage activity shall employ personnel to patrol and check the facility at least once a day (excluding those who have obtained approval as set forth in Article 43-27, paragraph (2) of the Act).

(2) Pursuant to the provisions of Article 43-18, paragraph (1) of the Act, a licensee of spent fuel interim storage activity who has obtained approval as set forth in Article 43-27, paragraph (2) of the Act shall employ radiation workers who ordinarily enter radiation controlled areas to patrol the spent fuel interim storage facilities at least once every week.

(Periodic Self-Inspection of Spent Fuel Interim Storage Facilities)

Article 32

(1) Pursuant to the provisions of Article 43-18, paragraph (1) of the Act, a licensee of a spent fuel interim storage activity shall take inspection measures set forth in the following items (when the approval set forth in Article 43-27, paragraph (2) of the Act has been obtained, excluding item (i)):

(i) conducting an annual inspection to determine whether the performance of the spent fuel interim storage facility conforms with the technical standards specified by the NRA Ordinance prescribed in Article 43-10-2 of the Act;

(ii) conducting monthly tests of each part of alarm and other emergency devices and annual performance tests for each overall device.

(iii) conducting annual calibration tests for instruments and radiation detectors that directly relate to the operational safety of spent fuel interim storage facilities.

(2) A licensee who has obtained approval as set forth in Article 43-27, paragraph (2) of the Act shall conduct an annual inspection to ensure that operations of a spent fuel interim storage facility is

maintained as stated in the application form for said approval or the approval for a change as set forth in Article 12-6, paragraph (3) of the Act as applied mutatis mutandis pursuant to Article 43-27, paragraph (3) of the Act, or documents attached to such application form.

(Operation of Spent Fuel Interim Storage Equipment)

Article 33 Pursuant to the provisions of Article 43-18, paragraph (1) of the Act, a licensee shall take the following measures for the operation of spent fuel interim storage equipment (this does not apply where approval in Article 43-27, paragraph (2) of the Act has been obtained):

(i) having qualified personnel persons operate the spent fuel interim storage equipment;

(ii) ensuring that qualified personnel are on duty during any spent fuel interim storage equipment operations;

(iii) qualified operators oversee pre-commencement, commencement and post-shutdown operations;

(iv) specifying actions to be taken in an emergency overseen by qualified personnel;

(v) maintaining ventilators, radiation detectors and emergency equipment to allow them to function at any time;

(vi) before starting test operations, checking measures to be taken in the event of an abnormality;

(vii) during operational training, trainees under the supervision of operators, are instructed on matters to be observed;

(viii)storing spent fuel in the main body of the spent fuel interim storage equipment;

(ix) precautions to be taken when storing spent fuel in a prominent place at an interim storage facility;

(x) Personnel other than those directly engaged in the interim storage of spent fuel follow the instructions of qualified operators in the facility;

(xi) taking necessary measures for spent fuel cooling;

(xii) storing spent fuel to prevent it reaching criticality in any situation.

(Transport within the Site)

Article 34

(1) Pursuant to the provisions of Article 43-18, paragraph (1) of the Act, a licensee of a spent fuel interim storage facility shall take the following measures covering the transportation of spent fuel within the site:

(i) transporting spent fuel in a manner to reduce the risk of it reaching criticality under any circumstance;

(ii) during transportation, encasing spent fuel in a container but with the following exceptions:

(a) transporting contaminated material with a radioactive concentration not exceeding NRA limits and for which prevention measures specified by the NRA have already been taken.

(b) transporting bulky loads such as large machinery that is difficult to encasebut otherwise employing NRA approved hazard prevention measures;

(iii) transport containers shall conform with the following standards:

(a) the length of each side of the cuboid circumscribed to said container is no shorter than 10 cm;

(b) a container can be handled easily and safely and will not suffer from cracks or damage from changes in temperature, internal pressures and oscillation during transportation;

(iv) ensuring that the dose equivalent rates at the surface and at a distance of one meter from the surface of a container will not exceed the dose equivalent rates specified by the Nuclear Regulation Authority and that the density of radioactive material on the surface of the material to be transported will not exceed 10% of the surface density limit set forth in Article 29, item (i), (c);

(when transport is conducted without encapsulating the material contaminated by nuclear fuel material prescribed in item (ii), (a) or (b) in a container, pursuant to the provisions of the proviso to said item, said material contaminated by spent fuel; hereinafter referred to as "material to be shipped" in this Article), the vehicle loading or containing said material to be transported, or other machinery or components for transporting the spent fuel, etc. (hereinafter referred to as "transport equipment" in this Article) will not exceed the dose equivalent rates specified by the Nuclear Regulation Authority, respectively, and that the density of radioactive material on the surface of the material to be transported will not exceed 10% of the surface density limit set forth in Article 29, item (i), (c);

(v) ensuring that contamined materials do not move, fall or drop during transportation;

(vi) ensuring that spent fuel is not loaded onto the same transport as hazardous materials specified by the Nuclear Regulation Authority;

(vii) deploying guards, signs and other measures at necessary locations along the transportation route to limit the number of unauthorized personnel or vehicles;

(viii)reducing transportation speeds and, over long distances, employing a backup escort security vehicle;

(ix) to ensure security, employing a person qualified in handling spent fuel to accompany and suervise as necessary;

(x) Transport and containers to be clearly marked by NRA-approved labels. (closed type containers should be designed not to require reshipment enroute, be able to withstand repeated use and be equipped for mechanical loading and offloading).

(2) In the case set forth in the preceding paragraph, when it is difficult to implement the measures set forth in item (iii) and item (iv) due to special reasons, it is permissible to user other NRA-approved measures (provided that does equivalent rates at the surface of the material does not exceed NRA limits).

(3) The provisions of paragraph (1), item (ii) to item (iv) and item (vii) to item (x) do not apply to transportation within radiation controlled areas.

(4) In the case where a licensee has taken necessary security measures with regard to the transport of spent fuel according to the technical standards for transport prescribed in Article 3 to Article 17 of the Ministerial Ordinance on Transport of Nuclear Fuel Material,. Outside the Factory or Site (Ministerial

Ordinance Issued by the Prime Minister's Office No. 57 of 1978) and Article 3 to Article 19 of the Ministerial Ordinance on Transport of Nuclear Fuel Material,by Vehicle (Ordinance of the Ministry of Transport No. 72 of 1978), the licensee may transport said spent fuel within the spent fuel interim storage facility complex, notwithstanding the provisions of paragraph (1).

(Disposal within the Site)

Article 35 Pursuant to the provisions of Article 43-18, paragraph (1) of the Act, a licensee of spent fuel interim storage activity shall take the following measures to dispose of radioactive waste at the spent fuel interim storage facility:

(i) radioactive waste disposal is conducted by appropriately dressed personnel skilled in disposal and related radiation protection expertise;

(ii) persons entering the disposal facilities and not directly engaged in the activities must follow the instructions of those engaged in the disposal;

(iii) disposing of gaseous radioactive waste with either of the following methods:

(a) discharging such waste through the exhaust facilities;

(b) storing waste in tanks to prevent radiation hazards;

(iv) when adopting the disposal method set forth in (a), reducing as much as possible the concentration of radioactive material in the exhaust through filtration, radioactivity decay, and air dilution at the exhaust facilities; in such a circumstance, monitoring radioactive material concentrations at the exhaust vent or exhaust monitoring equipment, to ensure that they do not exceed NRA limits in the air outside the peripheral monitoring area;

(v) disposing of radioactive liquid waste by any of the following methods:

(a) discharging waste through the drainage facilities;

(b) storing waste for disposal in tanks to prevent radiation hazards;

(c) encasing waste in a vessel or solidifying it with a vessel and storing it for disposal at a storage facility capable of preventing radiation hazards;

(d) solidifying waste in solidification equipment capable of preventing radiation hazards;

(vi) when adopting the disposal method in (a) of the preceding item, reducing radioactive material concentrations in the effluent as much as possible through filtration, evaporation, adsorption using the ion-exchange resin method, radioactivity decay and dilution with a large amount of water at the drainage facilities; in this case, monitoring the concentration of radioactive material in the effluent at the discharge port or effluent monitoring equipment, thereby ensuring that radioactive concentrations in the water at the boundary outside the peripheral monitoring area do not exceed NRA-mandated limits.

(vii) when adopting the disposal method set forth in (c) of item (v) and encasing radioactive waste in a vessel, said vessel shall conform to the following standards:

(a) the vessel has a less permeable structure, is resistant to corrosion, and prevents leaks of radioactive waste;

(b) the vessel is risk free from cracks or other damage;

(c) the vessel lid is hard to remove;

(viii)when adopting the disposal method in (c) of item (v) solidifying radioactive waste with a container, the vessel shall be able to prevent a scatter or leak of radioactive waste;

(ix) when adopting the disposal method set forth in (c) of item (v) storing radioactive waste for disposal at a storage disposal facility able to prevent radiation hazards, the following procedures are to be followed:

(a) when encasing radioactive waste in a vessel and storing it for disposal, taking measures to prevent the spread of contamination should the vessel develop and cracks or other damage,including covering said container with materials that can absorb the radioactive waste in its entirety, or by installing a tray to receiv all of radioactive waste;

(b) signposting a container encasing or solidified with radioactive waste, and providing a serial number for cross checking said radioactive waste with the details recorded based on the provisions of Article 27;

(c) posting precautions for management in a prominent place at said storage facilities;

(x) disposing solid radioactive waste by any of the following methods:

(a) incinerating waste in an incinerator capable of preventing radiation hazards;

(b) encapsulating waste in a vessel or solidifying it with a container and storing said waste before disposal at an appropriate storage disposal facility;

(c) with regard to such radioactive waste such as large machinery which is difficult to dispose of by method (b) above, or waste that requires radioactivity decay, storing such waste for disposal at a storage facility that can prevent radiation hazards;

(xi) The provisions of item (vii), item (viii) and item (ix) (excluding (a) of said item) shall apply mutatis mutandis with regard to disposal by the method set forth in (b) of the preceding item;

(xii) The provisions of (c) of item (ix) shall apply mutatis mutandis with regard to disposal by the method set forth in (c) of item (x).

(Periodic Evaluation of Spent Fuel Interim Storage Facilities)

Article 35-2

(1) Pursuant to the provisions of Article 43-18, paragraph (1) of the Act, a spent fuel interim storage facility licensee shall undertake the following measures for each of the spent fuel interim storage facilities at intervals not exceeding ten years:

(i) evaluating operational safety activities at the spent fuel interim storage facility;

(ii) evaluating the incorporation of the latest technical knowledge into operational safety activities.

(2) A licensee shall undertake the following measures no later than the 20th anniversary of the day that operations began:

(i) conducting a technical evaluation on ageing;

(ii) based on the technical evaluation outlined in the preceding item, drawing up a ten-year

operational safety plan for the spent fuel interim storage facility.

(3) The evaluation and plan outlined in the preceding paragraph shall be reevaluated at intervals of not exceeding ten years.

(4) The provisions of the preceding three paragraphs do not apply where an approval in Article 43-27, paragraph (2) of the Act has already been obtained.

(Operational Safety Programs)

Article 37

(1) A person seeking approval for Operational Safety Programs under Article 43-20, paragraph (1) of the Act shall specify the following details for each site for which he/she intends to obtain approval, and shall submit an application form containing said Operational Safety Programs to the Nuclear Regulation Authority:

(i) matters concerning compliance with related laws and regulations, as well as the Operational Safety Programs (including senior management involvement);

(ii) matters concerning the development of a safety culture (including senior management involvement);

(iii) matters concerning quality assurance of the spent fuel interim storage facilities (including the method and system for conducting root cause analysis and positioning of the procedure manuals in the Operational Safety Programs);

(iv) matters governing the duties of those engaged in the operation and management of the spent fuel interim storage facilities and their organization (excluding what is set forth in the following item);

(v) matters covering the duties of chief engineers of spent fuel, the authority necessary for chief engineers of spent fuel in supervising operational safety, and their positions in the organization;

(vi) matters concerning operational safety education for radiation workers at spent fuel interim storage facilities:

(a) matters governing policies to provide operational safety education (including drawing up an implementation plan);

(b) details of education on operational safety in the following areas:

1. compliance with related laws and regulations, as well as Operational Safety Programs;
2. the structure, functions, and operation of spent fuel interim storage facilities;
3. radiation control;
4. the handling of nuclear fuel material and contaminated material;
5. actions to be taken in an emergency;

(c) other matters necessary for operational safety education related to spent fuel interim storage facilities;

(vii) the operation of equipment, the management of which is particularly necessary in view of operational safety;

(viii) the specification of radiation controlled areas and peripheral monitoring areas, as well as the access control to these areas;

(ix) the exhaust and effluent monitoring equipment;

(x) the monitoring of doses, dose equivalents, concentration of radioactive material, and density of radioactive material on the surface of radioactively contaminated materials, as well as the decontamination;

(xi) the management of radiation detectors and measurement methods;

(xii) the policing and security of spent fuel interim storage facilities and accompanying actions;

(xiii) the periodic self-inspection of spent fuel interim storage facilities;

(xiv) the reception, transport, and other handling of spent fuel;

(xv) the disposal of radioactive waste;

(xvi) actions to be taken in an emergency;

(xvii) maintenance of proper records and reports on operational safety pertaining to the spent fuel interim storage facilities (including the status of compliance with the Operational Safety Programs). Such reports include ones made to senior management following any incidents such as accidents and other failures under items of Article 43-13,;

(xviii) periodic evaluation of the spent fuel interim storage facilities;

(xix) sharing with other licensees technical information on operational safety obtained from the business operators involved in maintenance and checks;

(xx) information disclosure on non-compliance if any;

(xxi) other matters necessary for operational safety of spent fuel interim storage facilities.

(2) A person seeking approval under Article 43-27, paragraph (2) of the Act shall add the following details to the Operational Safety Programs approved under Article 43-20, paragraph (1) of the Act or obtain approval for the amended Operational Safety Programs, for the purpose of undertaking decommissioning measures specified in a decommissioning plan for which he/she intends to obtain approval, no later than the date of said approval. The same applies when intending to further amend said amended Operational Safety Programs. Matters include:

(i) the system for complying with the related laws and regulations, as well as the Operational Safety Programs (including senior management involvement);

(ii) the system for developing a safety culture (including senior management involvement);

(iii) quality assurance of the spent fuel interim storage facilities (including a system for conducting root cause analysis, and positioning of the procedure manuals in the Operational Safety Programs);

(iv) quality assurance of the decommissioning measures (including the system for conducting root cause analysis, and positioning of the procedure manuals in the Operational Safety Programs);

(v) the duties of those engaged in decommissioning measures and their organization (excluding what is set forth in the following item);

(vi) the duties of chief engineers of spent fuel, the authority necessary for them to supervise

operational safety and their positions in the organization;

(vii) operational safety education for radiation workers engaged in decommissioning measures:

(a) policies for providing education on operational safety (including the drawing up of an implementation plan)

(b) the following matters concerning the details of education on operational safety:

1. compliance with related laws and regulations, as well as Operational Safety Programs;
2. the structure and functions of spent fuel interim storage facilities;
3. decommissioning measures for spent fuel interim storage facilities;
4. radiation control;
5. the handling of nuclear fuel material and material contaminated by nuclear fuel material;
6. actions to be taken in an emergency;

(c) other matters necessary for education on operational safety pertaining the spent fuel interim storage facilities;

(viii) the operation of equipment, the management of which is crucial to operational safety;

(ix) the specification of radiation controlled areas, protection areas, and peripheral monitoring areas, as well as access control to these areas;

(x) the exhaust monitoring equipment and effluent monitoring equipment;

(xi) monitoring of doses, dose equivalents, concentration of radioactive material, and density of radioactive material on the surface of material contaminated by radioactive material, as well as the removal of contamination;

(xii) the management of radiation detectors and measurement methods;

(xiii) the periodic self-inspection of the spent fuel interim storage facilities;

(xiv) the policing of spent fuel interim storage facilities and accompanying actions;

(xv) the disposal of radioactive waste;

(xvi) actions to be taken in an emergency;

(xvii) establishment of proper records and reports on operational safety pertaining to the spent fuel interim storage facilities, including the status of compliance with the Operational Safety Programs. Such reports include ones made to senior management in the event of incidents such as accidents and failures set forth in the items of Article 43-13;

(xviii) matters concerning proper records and reports on operational safety pertaining to the decommissioning measures including the status of compliance with the Operational Safety Programs (such reports include ones made to senior management in the event incidents such as accidents and failures set forth in the items of Article 43-13;

(xix) sharing with other licensees of spent fuel interim storage facilities technical information on operational safety documented by maintenance and checks operators;

(xx) information disclosure on non-compliance if any;

(xxi) management of decommissioning measures;

(xxii) other matters on operational safety of spent fuel interim storage facilities or decommissioning

measures.

(3) The provisions of the main clause of paragraph (1) apply mutatis mutandis in the cases set forth in the preceding paragraph.

(4) One original copy of the application form set forth in paragraph (1) (including the cases where said paragraph is applied mutatis mutandis pursuant to the preceding paragraph) shall be submitted.

(Inspection of the Status of Compliance with the Operational Safety Programs)

Article 38

(1) An inspection under Article 43-20, paragraph (5) of the Act will be conducted four times every year; however, the inspection for spent fuel interim storage facilities for which approval as set forth in Article 43-27, paragraph (2) of the Act has been obtained, will be conducted four times or less every year, in accordance with the progress of the decommissioning measures.

(2) The matters specified by the Ordinance of the NRA as set forth in Article 12, paragraph (6) of the Act as applied mutatis mutandis pursuant to Article 43-20, paragraph (6) of the Act shall be as follows:

(i) entering the office, facility or site;

(ii) inspecting books, documents, equipment, components, or any other necessary property;

(iii) questioning employees and other people concerned;

(iv) requesting the submission of spent fuel or any other necessary samples (limited to the minimum amount necessary for testing).

(Physical Protection Programs)

Article 41

(1) A person seeking approval for Physical Protection Programs under Article 43-25, paragraph (1) of the Act shall submit an application form for said Physical Protection Programs to the NRA and specify the following matters for each place of business:

(i) a system for complying with related laws and regulations, as well as the Physical Protection Programs (including senior management involvement);

(ii) a system for developing a security culture (including senior management involvement);

(iii) the duties of those engaged in the physical protection of specified nuclear fuel material and their organization;

(iv) specifications of the physical protection areas (for the place of business handling the specified nuclear fuel material set forth in item (i) to item (vi) of the table of Article 36, paragraph (1), the physical protection areas and peripheral physical protection areas; the same applies in the following item) and the access control areas, as well as the patrol and monitoring;

(v) access control for physical protection areas;

(vi) management of specified nuclear fuel material;

(vii) measures for the constant maintainence of equipment or devices necessary for the physical

protection of specified nuclear fuel material;

(viii) an information system security plan;

(ix) maintenance and inspection of equipment to physically protect specified nuclear fuel material;

(x) emergency responses;

(xi) the development of a communication system;

(xii) information management on measures necessary for the physical protection of specified nuclear fuel material;

(xiii) the education and training necessary for the physical protection of specified nuclear fuel material;

(xiv) an emergency response plan for spent fuel interim storage facilities;

(xv) measures to be taken in response to threats such as sabotage (limited to matters falling under Article 36, paragraph (2), item (xxiv) (including cases where said item is applied mutatis mutandis pursuant to paragraph (3) of said Article));

(xvi) periodic evaluation and improvements necessary for the physical protection of specified nuclear fuel material;

(xvii) records on the physical protection of specified nuclear fuel material pertaining to the spent fuel interim storage facilities (including the status of compliance with physical protection programs);

(xviii) other items necessary for the physical protection of specified nuclear fuel material at spent fuel interim storage facilities.

(2) One original copy and one duplicate copy of the application form set forth in the preceding paragraph shall be submitted (when filing an application for any of the spent fuel interim storage facilities set forth in item (iv) of the table of Article 63, paragraph (1) of the Order that is specified by the Nuclear Regulation Authority in a public notice, one original copy and two duplicate copies of the application form).

(Inspection of the Status of Compliance with the Physical Protection Programs)

Article 41-2

(1) The inspection under Article 12-2, paragraph (5) of the Act as applied mutatis mutandis pursuant to Article 43-25, paragraph (2) of the Act is to be conducted once every year.

(2) Matters specified by the NRA Ordinance as set forth in Article 12-2, paragraph (6) of the Act as applied mutatis mutandis pursuant to Article 43-25, paragraph (2) of the Act shall be as follows:

(i) entering the office, facility or site;

(ii) inspecting books, documents, equipment, components, or any other necessary property;

(iii) questioning employees and other people concerned;

(iv) requesting the submission of specified nuclear fuel material, or any other necessary samples (limited to the minimum amount necessary for testing).

(Application for Approval for Decommissioning Plans)

Article 43-3-2

(1) A person seeking approval for a plan concerning decommissioning measures (hereinafter referred to as a "decommissioning plan"), pursuant to the provisions of Article 43-27, paragraph (2) of the Act, shall draw up a decommissioning plan concerning the matters set forth in the following items and submit an application form containing said plan to the Nuclear Regulation Authority:

(i) the name and address of the applicant and, in the case of a corporation, the name of its representative;

(ii) the name and location of the place of business pertaining to the decommissioning measures;

(iii) the spent fuel interim storage facilities subject to decommissioning measures pertaining to the decommissioning plan for which approval as set forth in Article 43-27, paragraph (2) of the Act is sought (hereinafter referred to as the "facilities under decommissioning measures") and their premises;

(iv) facilities to be dismantled and the methods of the dismantlement;

(v) removal of contamination caused by spent fuel;

(vi) disposal of material contaminated by spent fuel;

(vii) decommissioning processing measures.

(2) The documents or drawings set forth in the following items shall be attached to the application form set forth in the preceding paragraph:

(i) to (x) (omitted)

(3) One original copy and one duplicate copy of the application form set forth in paragraph (1) shall be submitted.

(Standards for Approval for Decommissioning Plans)

Article 43-6 The standards specified by the Ordinance of the NRA as prescribed in Article 12-6, paragraph (4) of the Act as applied mutatis mutandis pursuant to Article 43-27, paragraph (3) of the Act shall be as follows:

(i) spent fuel has been removed from the spent fuel interim storage facilities;

(ii) the management, processing, and disposal of material contaminated by spent fuel has been conducted in an appropriate manner;

(iii) the implementation of the decommissioning measures is appropriate to prevent disasters that could be caused by material contaminated by spent fuel.

(Application for Confirmation of the Completion of Decommissioning Measures)

Article 43-7

(1) A person who wishes to obtain confirmation of the completion of the decommissioning measures, pursuant to the provisions of Article 12-6, paragraph (8) of the Act as applied mutatis mutandis pursuant to Article 43-27, paragraph (3) of the Act, shall submit an application form to the NRA containing following items:

(i) to (v) (omitted)

(2) A document containing the following matters shall be attached to the application form set forth in the preceding paragraph:

(i) and (ii) (omitted)

(3) One original copy and one duplicate copy of the application form set forth in paragraph (1) shall be submitted.

(Standards for Confirmation of the Completion of Decommissioning Measures)

Article 43-8 The standards specified by the NRA Ordinance as prescribed in Article 12-6, paragraph (8) of the Act as applied mutatis mutandis pursuant to Article 43-27, paragraph (3) of the Act shall be as follows:

(i) there is no need to take any measures to prevent soil radiation hazards in the premises of the facilities under decommissioning and facilities remaining on said premises;

(ii) the disposal of the material contaminated by spent fuel has been completed;

(iii) the handover of the radiation control records prescribed in Article 27, paragraph (1) to an organization designated by the Nuclear Regulation Authority set forth in paragraph (5) of said Article has been completed.

(Report of Accidents and Failures)

Article 43-13 When falling under any of the following items, a licensee of a spent fuel interim storage facility (including former licensees; hereinafter the same applies in the following Article and Article 48) shall immediately inform the Nuclear Regulation Authority, and make a a situation report and actions to be taken within ten days, pursuant to the provisions of Article 62-3 of the Act:

(i) when any spent fuel has been stolen or has gone missing;

(ii) in the event of a failure of the spent fuel interim storage facilities and when special measures are required for repair work and this has interrupted the interim storage of spent fuel;

(iii) when a failure has interrupted or might possibly interrupt the interim storage of spent fuel in a limited area; has interrupted the function for preventing radiation hazards due to external radiation, the removal function of the decay heat from the spent fuel, or the function for preventing a fire or explosion;

(iv) when a failure or other unexpected event in the spent fuel interim storage facilities has caused abnormalities in discharging gaseous radioactive waste through the exhaust facilities or discharging radioactive liquid waste through the drainage facilities;

(v) where gaseous radioactive waste has been discharged through the exhaust facilities, and when the concentration of radioactive material in the air outside the peripheral monitoring area has exceeded the concentration limit set forth in Article 35, item (iv);

(vi) where radioactive liquid waste has been discharged through the drainage facilities, and when the

concentration of radioactive material in the water at the boundary outside the peripheral monitoring area has exceeded the concentration limit set forth in Article 35, item (vi);

(vii) when any spent fuel has leaked outside the radiation controlled area;

(viii)when a failure or other unexpected event has caused a leak of spent fuel leak within a radiation controlled area; provided, however, that the cases falling under any of the following are excluded (excluding the cases where measures have been newly taken such as access control or lock up the place where the leak occurred or the case where the leaked material has spread to outside the radiation controlled area):

(a) when leaked liquid spent fuel has not spread outside the weir to prevent the spread of any leak that had been installed around the equipment where the leak occurred;

(b) where spent fuel in the form of gas has leaked but where the ventilators at the leak site continue to functionin properly;

(c) when the radiation leakof spent fuel is minor;

(ix) when the spent fuel has reached or may possibly reach criticality;

(x) when a failure or other unexpected events have caused persons in the radiation controlled area to be exposed to doses which exceeded or may possibly exceed 5mSv for radiation workers or 0.5mSv for persons other than radiation workers;

(xi) when any radiation worker has been exposed to radiation that exceeds or may possibly exceed the dose limit set forth in Article 30, paragraph (1), item (i);

(xii) any other hazard or potential hazard which may affect people in relation to the spent fuel facilities, exluding those hazards (except radiation incidents) that do not require hosptal treatment.

(Emergency Measures)

Article 44 Pursuant to the provisions of Article 64, paragraph (1) of the Act, a licensee of spent fuel interim storage activity shall take the following emergency measures:

(i) Immediately extinguish an outbreak of fire and preventing it from spreading to the spent fuel interim storage facilities and at the same time immediately reporting the outbreak to fire authorities;

(ii) moving spent fuel to a safar place if time allows and prohibiting access to everyone except guards and officials erecting warning signs and roping off threatened areas;

(iii) to prevent radiation hazards, warning people within or near spent fuel interim storage facilities to evacuate;

(iv) preventing the spread of spent fuel contamination and removing the contaminant;

(v) rescuing and promptly evacuating persons who have received or possibly receiving radiation hazards;

(vi) taking other necessary measures for preventing radiation hazards.

Table G1-2 Ordinance on Standards for the Location, Structure, and Equipment of Spent Fuel Interim Storage Facilities (Excerpt)

(Prevention of Criticality of Spent Fuel)

Article 3 Spent fuel interim storage facilities shall be designed to prevent any risk that spent fuel may reach criticality.

(Shielding)

Article 4

(1) Spent fuel interim storage facilities shall incorporate measures such as shielding to significantly reduce doses around the place of business from direct and sky-shine radiation.

(2) To prevent radiation hazards, spent fuel interim storage facilities shall incorporate measures such as shielding to reduce doses in radiation controlled areas or other places within the business area where people are present.

(Function to Confine Spent Fuel)

Article 5: Spent fuel interim storage facilities shall be able to effectively confine spent fuel in a limited area.

(Heat Removal)

Article 6: Spent fuel interim storage facilities shall be able to effecively remove the decay heat of spent fuel without using power.

(Prevention of Fire Damage)

Article 7: Spent fuel interim storage facilities shall use a combination of the following measures to ensure so that basic safety functions will not be impaired by fire or explosions;

(i) preventing fires or explosions;

(ii) detecting early fires or explosions and controlling any outbreak;

(iii) reducing the effects of fire and explosions.

(Constructing Spent Fuel Interim Storage Facilities)

Article 8

(1) Spent fuel interim storage facilities shall be constructed on terrain that can support said complexes even in the case of seismic shocks calculated under paragraph (2) of the following Article (with regard to facilities that are capable of ensuring basic safety functions, including the impact of seismic force set forth in paragraph (3) of said Article).

(2) Spent fuel interim storage facilities shall be constructed in areas where there is a negligible possibility of loss of basic safety functions even in the event of its deformation.

(3) Facilities to ensure basic safety functions shall be constructed on terrain where there is

negligible possibility of displacement.

(Prevention of Damage due to Earthquakes)

Article 9

(1) Spent fuel interim storage facilities shall be designed to fully sustain a seismic force.

(2) Such seismic forces shall be calculated in accordance with degrees of radiation impact on the public resulting from a possible loss of facility safety functions caused by an earthquake.

(3) Spent fuel interim storage facilities shall be designed to protect their basic safety functions, while in service, against a seismic force that acts due to acceleration caused by an earthquake that may possibly exercise large effects on said spent fuel interim storage facilities.

(4) Spent fuel interim storage facilities shall be designed to retain their basic safety functions even in the event of slope failure triggered by earthquakes..

(Prevention of Tsunami Damage)

Article 10: Spent fuel interim storage facilities shall be designed to retain their basic safety functions even in the event of a major impact from a tsunami

(Prevention of Damage from Other External Events)

Article 11

(1) Spent fuel interim storage facilities shall be designed to retain their basic safety functions even in the event of natural phenomena other than earthquakes and tsunamis.

(2) Spent fuel interim storage facilities shall be designed to retain their basic safety functions in the wake of human-induced incidents (excluding intentional events) within the business area or nearby vicinity that could potentially impair the safety of said facility

(Prevention of Illegal Entry into Spent Fuel Interim Storage Facilities)

Article 12: The business area will be equipped to prevent illegal entry or the introduction of explosives, flammable and other items which could cause personal harm, as well as unauthorized computer access (as prescribed in Article 2, paragraph (4) of the Act on the Prohibition of Unauthorized Computer Access (Act No. 128 of 1999)).

(Facilities with Safety Functions)

Article 13:

(1) When sharing any facilities with safety functions with other nuclear facilities or sharing any equipment belonging to facilities with safety functions within single spent fuel interim storage facilities, said facilities with safety functions or equipment shall be such that they do not damage the safety of the spent fuel interim storage facilities.

(2) Facilities with safety functions shall be subject to an inspection or testing to confirm the

integrity of said safety functions and their proper maintenance or repair.

(Prevention of Radiation Hazards in the Event of a Postulated Accident that May Cause the Highest Dose)

Article 14 Spent fuel interim storage facilities shall be designed to prevent public radiation hazards around the place of business in the event of an assumed accident which could cause the highest dose.

(Metal Cask)

Article 15

(1) Spent fuel interim storage facilities shall be equipped with metal casks.

(2) A metal cask shall be such that it can ensure the integrity of spent fuel in light of the ageing of said metal cask and the spent fuel.

(Facilities for Accepting Spent Fuel)

Article 16: Spent fuel interim storage facilities shall have facilities both to accept spent fuel while ensuring the basic safety functions during transporting and receipt of the metal casks in which spent fuel is encased.

(Instrumentation and Control Facilities)

Article 17:

(1) Spent fuel interim storage facilities shall have instrumentation and control facilities to properly monitor that as part of the basic safety functions, the function for confining spent fuel and the function for removing heat are secured.

(2) Spent fuel interim storage facilities shall be able to detect and immediately raise the alarm about the possibility of an accident which could damage the complex' basic safety functions where the concentration of radioactive material or radiation doses set forth in Article 19, item (ii) has risen significantly, or where there is a risk that a significant amount of radioactive waste could leak from disposal facilities.

(Disposal Facilities)

Article 18:

(1) Spent fuel interim storage facilities shall have disposal facilities (excluding those for storing radioactive waste for disposal) able to treat radioactive waste generated in said facilities and significantly reduce airborne radioactive concentrations outside the peripheral monitoring area and in water at the border of the peripheral monitoring area.

(2) Spent fuel interim storage facilities shall be able to store radioactive waste for disposal.

(Radiation Control Facilities)

Article 19: The business are shall have radiation control facilities, as prescribed as follows:

(i) equipment for monitoring and managing doses to help protect radiation workers;

(ii) equipment to monitor and measure radioactive material concentrations and radiation doses within the business place and surrounding area;

(iii) equipment to register information at an appropriate place to help protect the public and radiation workers from radiation.

(Standby Power)

Article 20: Spent fuel interim storage facilities shall secure standby power for monitoring and other necessary equipment in the event of loss of electric power supply from the off-site power grid.

(Communications Equipment)

Article 21

(1) The business place shall have a warning device and communications equipment to deliver necessary instructions to personnel in the area in the event of an accident.

(2) The place of business shall be able to communicate with necessary places outside the immediate vicinity with a dedicated communications system in the event of an accident.

(3) Spent fuel interim storage facilities shall have equipment to assist in the evacuation of people from the place of business.

Table G1-3 Ordinance on Technical Standards for the Design and Construction Methods of Spent Fuel Interim Storage Facilities (Excerpt)

(Prevention of Criticality of Spent Fuel)

Article 3: Spent fuel interim storage facilities shall have measures such as criticality-safe geometries to eliminate the possibility that spent fuel may reach criticality.

(Prevention of Damage due to Fire)

Article 4:

(1) If there is a risk that spent fuel interim storage facilities may be affected by a fire or explosion and their basic safety functions damaged, automatic fire extinguishing and alarm equipment shall be installed..

(2) The fire extinguishing equipment and alarm equipment set forth in the preceding paragraph shall be such that their failure, damage or malfunction would be unlikely to impair the basic safety functions of the spent fuel interim storage facilities.

(3) With regard to facilities with safety functions that may be damaged by a fire or explosion, noncombustible or nonflammable materials shall be used wherever possible, while preparing proper protection measures such as the installation of fire walls.

(Ground for Constructing Spent Fuel Interim Storage Facilities)

Article 5: Spent fuel interim storage facilities shall be constructed on terrain capable of supporting such structures even in the case of seismic tremors described in Article 8, paragraph (1) of the Ordinance on Standards for Permission for Activity.

(Prevention of Earthquake Damage)

Article 5-2: Spent fuel interim storage facilities shall be constructed so that even seismic damage (calculated under Article 9, paragraph (2) of the Ordinance on Standards for Permission for Activity) will not cause radiation hazards to the public.

(2) Spent fuel interim storage facilities shall be constructed so that their basic safety functions will not be impaired by a seismic force set forth in Article 9, paragraph (3) of the Ordinance on Standards for Permission for Activity.

(3) In order to ensure that the basic safety functions of spent fuel interim storage facilities will not be impaired due to slope failure resulting from an earthquake set forth in Article 9, paragraph (3) of the Ordinance on Standards for Permission for Activity, protection and other relevant measures shall be taken.

(Prevention of Damage due to Tsunamis)

Article 5-3: To ensure that the basic safety functions of spent fuel interim storage facilities will not be impaired due to tsunamis set forth in Article 10 of the Ordinance on Standards for Permission for Activity, protective and other necessary measures shall be taken.

(Prevention of Damage due to Impacts from the Other External Events)

Article 5-4:

(1) Where there is a risk that other natural phenomena (excluding earthquakes and tsunamis) may impair the basic safety functions of spent fuel interim storage facilities, protective measures such as strengthening ground foundations shall be taken.

(2) In regions adjacent to a peripheral monitoring area where there are places of business, railways, roads, or other factors that may cause outside impacts, protective and other measures shall be taken. They will ensure that the basic safety functions of a spent fuel interim storage facility will not be impaired because of fire, explosions or accidents involving vehicles, ships or aircraft carrying hazardous materials or any other human-induced events excluding intentional events.

(Prevention of Illegal Entry into Spent Fuel Interim Storage Facilities)

Article 5-5: The place of business where spent fuel interim storage facilities are installed (hereinafter referred to as the “place of business”) shall prepare measures to prevent

illegal entry and the introduction of explosive, flammable or other dangerous items that could harm personnel or cause physical damage. Other measures will be introduced to block unauthorized computer access as prescribed in Article 2, paragraph (4) of the Act on the Prohibition of Unauthorized Computer Access (Act No. 128 of 1999.

(Materials and Structures)

Article 6:

(1) Materials and structures of vessels and pipes belonging to spent fuel interim storage facilities and structures that support them and which are necessary to ensure their basic safety functions, shall be of sufficient strength and resistant to corrosion to fulfill their function.

(2) Vessels and pipes necessary for ensuring the basic safety functions of the spent fuel interim storage facilities shall be installed capable of resisting anticipated pressure or leakage tests without significant leakage.

(Heat Removal)

Article 7: Spent fuel interim storage facilities shall be designed to efficiently remove the decay heat of spent fuel or materials contaminated by spent fuel.

(Function for Confining Spent Fuel)

Article 8: Spent fuel interim storage facilities shall be designed to maintain the function for confining spent fuel in a limited area as follows:

(i) appropriate metal cask pose a negligible possibility of external leakages of spent fuel;

(ii) when connecting a pipe delivering non-contaminated spent fuel liquid materials to another pipe or vessel containing a contaminated fluid, the structure shall be so configured that it will prevent any contaminated spent fuel from flowing into the pipe delivering non-contaminated material;

(iii) Where equipment for handling material contaminated by spent liquid fuel is installed (restricted to that part of a facility where there is a risk that leakages of materials contaminated by spent liquid fuel may expand) will be constructed as follows:

(a) interior floor and wall surfaces are structured to make it difficult for material contaminated by liquid spent fuel to leak;

(b) an embankment to prevent an external leak of contaminated materials is installed at the entrance and other potentially vulnerable areas of any complex handling contaminated materials. This will not apply in instances where inside floor surfaces are lower than those of neighboring facilities or of the surrounding ground surface and there is therefore a negligible threat of leakage.

(c) spent fuel interim storage facilities are constructed so that any internal floor surface is

not higher than external drainage canals discharging effluent outside the place of business (excluding sealed ground water drainage canals which have no openings within the radiation controlled area and are thus not subject to contamination threat). This does not apply where said drainage canals are equipped with a system that safely disposes of the contaminated effluent and equipment for measuring the matters set forth in Article 15, paragraph (1), item (iii).

(Shielding)

Article 9:

(1) Spent fuel interim storage facilities shall be designed so that dose levels from direct and sky-shine radiation are far below NRA-specified dose limits.

(2) Shielding equipment will be installed to prevent external radiation hazards within the place of businesss. Measures will be taken to prevent potential radiation leaks where said shielding equipment has vulnerable openings, pipes, or other penetration points.

(Ventilation)

Article 9-2: Where there is a need to prevent radiation hazards due to air contaminated by spent fuel within the spent fuel interim storage facilities, ventilators shall be installed as prescribed as follows:

(i) ventilators have the capacity required to prevent radiation hazards;

(ii) ventilator construction ensures that air contaminated by spent fuel cannot flow back into the main system;

(iii) filters can be properly maintained, quickly replaced and their design ensures the easy removal of contaminated materials;

(iv) air inlets will not easily take in air contaminated by spent fuel.

(Prevention of Contamination by Spent-Fuel-Contaminated Material)

Article 10: In buildings heavily frequeneted by personnel, walls, floors and other areas subject to possible contamination can be easily cleaned and ‘de-contaminated.’

(Facilities with Safety Functions)

Article 11:

(1) When sharing any facilities with safety functions with other nuclear facilities or sharing any equipment within single spent fuel interim storage facilities, said facilities with safety functions or equipment shall be designed to not damage the safety of the spent fuel interim storage facilities.

(2) Facilities with safety functions shall be designed to ensure that safety inspections or testing and the maintenance or repair of said safety functions can be effectively conducted.

(Equipment for Transporting and Accepting)

Article 12 Equipment for transporting and accepting metal casks in which spent fuel is encased shall be installed as follows:

(i) the equipment for transporting and accepting metal casks in which spent fuel is encased can handle said casks safely;

(ii) such equipment can safely retain metal casks containing spent fuel should local power supplies be suspended.

(Instrumentation and Control Facilities)

Article 13: (1) Spent fuel storage facilities shall have equipment for measuring either directly or indirectly the following situations:

(i) surface temperature of metal casks in which spent fuel is encapsulated;

(ii) pressure at the closure head of metal casks in which spent fuel is encapsulated for monitoring seal performance of the head (excluding the instance where the closure heads are welded);

(iii) temperatures of air supply and exhaust of buildings where spent fuel is stored.

(2) Spent fuel interim storage facilities shall be equipped to detect and immediately raise the alarm to any risks posed to the basic safety functions of said facilities because of damage to or malfunctioning of equipment. Other factors may include high concentrations of radioactive material as outlined in Article 15, paragraph (1), item (ii) or where the dose equivalent of external radiation set forth in item (iv) of said paragraph has risen significantly, or where there arises a risk that a significant amount of radioactive liquid material leaks from the disposal facilities of radioactive liquid waste.

(Disposal Facilities)

Article 14: Equipment for disposing radioactive waste (excluding equipment for storing radioactive waste for disposal) shall be installed as follows:

(i) such equipment has the capability to dispose of radioactive waste generated in the spent fuel interim storage facilities so that the concentration of radioactive material in the air outside the peripheral monitoring area and in water at the border of the peripheral monitoring area will be lower than their respective concentration limits specified by the Nuclear Regulation Authority;

(ii) the equipment is installed separately from that for disposing of non-radioactive waste. This does not apply when non-radioactive fluid waste is fed into the equipment handling fluid radioactive waste but there is negligible possibility that this radioactive waste could flow back into the equipment handling non-radioactive fluid waste;

(iii) the equipment for disposing gaseous radioactive waste does not discharge waste at points other than the exhaust vent;

(iv) a filter in the equipment for disposing of gaseous radioactive waste must beproperly maintained, easily replaced and it ensures the easy removal of contamination by spent fuel;

(v) the equipment for disposing of radioactive liquid waste discharges said waste only at the discharge port.

(Radiation Control Facilities)

Article 15:

(1) The place of business shall have radiation control facilities to either directly or indirectly measure the following:

(i) NRA-specified dose equivalent rates at the side wall of the radiation shielding structure;

(ii) concentration of radioactive material in exhaust gases at or near the exhaust vent of the gaseous radioactive waste;

(iii) concentration of radioactive material in effluent at or near the discharge port of radioactive liquid waste:

(iv) dose equivalent and concentration of airborne radioactive material, as well as density of radioactive material on the surface of materials contaminated by radioactive material specified by the Nuclear Regulation Authority, all of which pertain to external radiation in the radiation controlled area;

(v) dose equivalent specified by the NRA of external radiation in the peripheral monitoring area.

(2) Radiation control facilities shall be designed to indicate at an appropriate place any necessary information contained in the preceding paragraph.

(Standby Power)

Article 16 Spent fuel interim storage facilities shall secure standby power to ensure the continued functioning of monitoring and other necessary equipment in the event of loss of electric power supply from the off-site power grid.

(Communications Equipment)

Article 16-2:

(1) The place of business shall have a warning device and communications equipment to alert and instruct personnel in the event of an accident.

(2) The place of business shall have the necessary equipment to communicate with other areas in the event of an accident.

(3) Spent fuel interim storage facilities shall have equipment to assist in the evacuation of personnel from the place of business.

Table G6-1 Matters to be specified in the Operational Safety Programs

(Article 37, paragraph (1) of the Ordinance on Activity of Interim Storage of Spent Fuel

1. The system for complying with related laws and regulations, as well as the Operational Safety Programs (including senior management involvement)
2. The system for developing a safety culture (including senior management involvement)
3. Quality assurance of the spent fuel interim storage facilities (including the method and system for conducting root cause analysis and positioning of the procedural manuals in the Operational Safety Programs)
4. The duties and organization of operational and management personnel of spent fuel interim storage facilities excluding the situation highlighted in the following paragraph
5. The duties and authority of spent fuel chief engineers in supervising operational safety, and their positions in the organization
6. Operational safety education for radiation worker at the spent fuel interim storage facilities:
   a. Policies to provide education on operational safety (including the development of an implementation plan)
   b. The following matters concerning the details of education on operational safety:
      (1) Compliance with related laws and regulations and Operational Safety Programs
      (2) The structure, functions, and operation of spent fuel interim storage facilities
      (3) Radiation control
      (4) Handling of nuclear fuel material and material contaminated by nuclear fuel material
      (5) Actions to be taken in an emergency
   c. Education on operational safety at spent fuel interim storage facilities:
7. The operation and management of equipment which is particularly important in view of operational safety
8. The specification of radiation controlled areas and peripheral monitoring areas, as well as access control to these areas
9. The exhaust monitoring and effluent monitoring equipment
10. The monitoring of doses, dose equivalents, concentration of radioactive material, and density of radioactive material on the surface of material contaminated by radioactive material, as well as decontamination
11. The management of radiation detectors and measurement methods
12. The policing of spent fuel interim storage facilities and accompanying actions
13. The periodic self-inspection of spent fuel interim storage facilities
14. The reception, transport and other handling of spent fuel
15. The disposal of radioactive waste
16. Actions to be taken in an emergency
17. Maintaining proper records and reports on operational safety at spent fuel interim storage facilities (including the status of compliance with the operational safety programs and

reports, including those two senior management, detailing incidents and accidents)

18. Periodic evaluation of the spent fuel interim storage facilities
19. Sharing with other similar licensees technical information on operational safety obtained from business operators conducting maintenance checks
20. Information disclosure on non-compliance if any
21. Other matters necessary for operational safety

II. Excerpt of Regulations Relevant to Section H

Table H1-1 Ordinance on Activity of Category 2 Waste Disposal of Nuclear Fuel Material and Materials Contaminated by Nuclear Fuel Material (Excerpt)

(Application for Permission for Category 2 Waste Disposal Activity)

Article 2: Details contained in an application form (limited to one pertaining to Category 2 waste disposal activity) as set forth in Article 51-2, paragraph (2) of the Act on the Regulation of Nuclear Source Material, Nuclear Fuel Material and Reactors (hereinafter referred to as the "Act") shall be as follows:

(i) with regard to the property and quantity of the nuclear fuel material set forth in Article 51-2, paragraph (2), item (iii) of the Act, entering the type and quantity of radioactive waste subject to Category 2 waste disposal, and the maximum radioactivity concentration and total amount of radioactivity for each type of radioactive material contained in said radioactive waste;

(ii) the location, structure and equipment of waste disposal facilities set forth in Article 51-2, paragraph (2), item (iv) of the Act, entering data in accordance with the following classification:
a. to g. (omitted)

(iii) the disposal method set forth in Article 51-2, paragraph (2), item (iv) of the Act, entering data in accordance with the following classification:
a. and b. (omitted)

(iv) the timing for amendment set forth in Article 51-2, paragraph (2), item (v) of the Act, entering the timing for each amendment or the abolition of the peripheral monitoring areas or measures prescribed in Article 17, which is to be made in accordance with the attenuation of radioactivity;

(v) the construction plan for waste disposal facilities set forth in Article 51-2, paragraph (2), item (vi) of the Act, entering the sequence and schedule of the construction work.

(2) A written business plan and other documents specified by the Ordinance of the Nuclear Regulation Authority (hereinafter referred to as the "Ordinance of the NRA") as prescribed in Article 30, paragraph (2) of the Order for Enforcement of the Act on the Regulation of Nuclear Source Material, Nuclear Fuel Material and Reactors (hereinafter referred to as the "Order") that shall be attached to the application form set forth in the preceding paragraph shall be as follows:
(i) to (ix) (omitted)

(3) One original copy and one duplicate copy of the application form set forth in paragraph (1) shall be submitted.

(Application for Permission for Changes)

Article 3 Statements in an application form (limited to an application form pertaining to Category 2 waste disposal activity) set forth in Article 33 of the Order shall be as follows:

(i) and (ii) (omitted)

(2) Documents set forth in the following items shall be attached to the application form set forth in the

preceding paragraph:

(i) to (vii) (omitted)

(3) One original copy and one duplicate copy of the application form set forth in paragraph (1) shall be submitted.

(Application for Confirmation Related to Category 2 Waste Disposal Pertaining to Waste Disposal Facilities)

Article 4

(1) A person who intends to seek confirmation related to Category 2 waste disposal pursuant to the provisions of Article 51-6, paragraph (1) of the Act shall submit an application form prepared in Appended Form 1 to the Nuclear Regulation Authority, together with the following documents:

(i) to (iv) (omitted)

(2) One original copy of the application form set forth in paragraph (1)

(Confirmation Related to Category 2 Waste Disposal Pertaining to Waste Disposal Facilities)

Article 5 Confirmation related to Category 2 waste disposal under Article 51-6, paragraph (1) of the Act shall be made for the matters set forth in the following items at the times respectively prescribed therein:

(i) the matters concerning the assembly of waste disposal facilities other than radiation control facilities: when the size of major parts of the respective facilities can be measured;

(ii) the assembly of radiation control facilities when said facilities are completed;

(iii) the closure of tunnels (those pertaining to Category 2 waste disposal activity): at the time when conducting the backfilling or blocking of the tunnel and its opening;

(iv) the matters other than those set forth in the preceding items: at the time when covering the waste disposal site with earth and sand or at any other time that the NRA finds appropriate.

(Technical Standards for Waste Disposal Facilities)

Article 6:

(1) The technical standards for Category 2 waste disposal activity prescribed in Article 51-6, paragraph (1) of the Act (hereinafter referred to as the "technical standards for waste disposal facilities, etc.") are as follows:

(i) the amount of radioactivity for each type of radioactive material contained in a waste landfill at the place of business shall not exceed the total amount of radioactivity for each type of material stated in the application form for permission. These are set forth in Article 51-2, paragraph (1) of the Act or Article 51-5, paragraph (1) of the Act and in the document containing the conditions attached when permission was granted under Article 62-2, paragraph (1) of the Act (hereinafter referred to as the "application form, etc." in this Article, Article 6-3, and Article 8);

(ii) before starting landfilling, standing water shall be removed and measures taken to prevent the

future infiltration of rainwater (when the waste disposal site is demarcated with internal partition equipment as set forth in item (iii) of the following paragraph, the demarcated area for landfilling; hereinafter the same applies in this item);

(iii) when landfilling solidified concrete waste and where there is a risk that radioactive material may spread outside the waste disposal site measures to prevent such an occurrence shall be taken;

(iv) the waste disposal site shall be filled with earth and sand so that there will no hole left after completing landfilling;

(v) explosive, corrosive and other hazardous substances shall not be landfilled;

(vi) when landfilling is completed the surface of the waste disposal site shall be covered so that buried materials and equipment installed at the waste disposal site are not easily exposed;

(vii) the waste disposal facilities shall contain the structures and equipment stated in the application form, in addition to satisfying the preceding items.

(2) The technical standards for pit disposal (by the method set forth in Article 1-2, paragraph (2), item (iv), (a)) are, in addition to items outlined in the preceding paragraph, as follows:

(i) the facilities shall be constructed by the method specified by the Nuclear Regulation Authority for the prevention of radiation hazards;

(ii) the engineered barrier structure shall satisfy the following requirements:

(a) it is structurally safe against self-weight, earth pressure and seismic force;

(b) measures are taken to prevent corrosion, taking into account the quality of the surface and underground water and the soil;

(iii) a waste disposal site that has an opening exceeding 50 square meters or a capacity exceeding 250 cubic meters must satisfy the requirements set forth in the preceding item. It will be demarcated by internal partition equipment, which is installed according to NRA specifications for the prevention of radiation hazards, into areas whose respective areas do not exceed around 50 square meters or into areas whose respective capacities does not exceed around 250 cubic meters;

(iv) while conducting landfill, the barrier and the internal partition equipment set forth in item (iii) shall be inspected as necessary. Where a risk of damage to such equipment or a radioactive leak is found, counter measures shall be taken;

(v) when landfilling is completed or where the waste disposal site is demarcated by the internal partition equipment set forth in item (iii), a cover that satisfies requirements set forth in item (ii) shall be installed promptly by an NRA authorized method to prevent radiation hazards, before the site or area is covered with earth and sand.

(3) The technical standards for pit disposal (by the method set forth in Article 1-2, paragraph (2), item (iv), (b)) are in addition to provisions provided for in paragraph (1), are as follows:

(i) the facilities shall be constructed by the NRA approved method method for the prevention of radiation hazards;

(ii) the facilities solidifying radioactive waste integrally shall satisfy the requirements set forth in item (ii) of the preceding paragraph and its volume shall not exceed around 500 cubic meters.

(Application for Confirmation Related to Category 2 Waste Disposal Pertaining to Radioactive Waste to be Disposed of)

Article 7

(1) A person seeking confirmation related to Category 2 waste disposal pertaining to radioactive waste, pursuant to the provisions of Article 51-6, paragraph (2) of the Act, shall submit an application to the Nuclear Regulation Authority, in accordance with the classification of radioactive waste set forth in the following items:

(i) a waste package: an application form in Appended Form 2;

(ii) solidified concrete waste: an application form in Appended Form 3.

(2) An application form as set forth in the items of the preceding paragraph shall be attached with the following documents when landfilling waste packages and the documents set forth in item (i) and item (iv) when landfilling solidified concrete waste:

(i) to (v) (omitted)

(3) One original copy of the application form set forth in paragraph (1) shall be submitted.

(Technical Standards for Radioactive Waste to be Disposed of)

Article 8

(1) The technical standards (limited to those pertaining to Category 2 waste disposal activity) prescribed in Article 51-6, paragraph (2) of the Act are to be as follows:

(i) in the case of Intermediate Depth Disposal

(a) radioactive waste to be disposed of shall be generated at the factory or place of business where a fuel facility (limited to a facility solely conducting the fabrication of fuel assemblies that contain mixed uranium and plutonium oxide), research reactor facility, power reactor facility or reprocessing facility is installed;

(b) radioactive waste to be disposed of shall be a waste package;

(c) said waste package shall be as specified in the following paragraph:

(ii) in the case of pit disposal:

(a) radioactive waste to be disposed of shall be generated at the facility or place of business where a research reactor facility or power reactor facility is installed;

(b) radioactive waste to be disposed of shall be solidified concrete waste or a waste package;

(c) said waste package or solidified concrete waste shall be as specified in the following paragraph or paragraph (3);

(iii) in the case of trench disposal:

(a) radioactive waste to be disposed of shall be generated at the facility or place of business where a research reactor facility or power reactor facility is installed;

(b) radioactive waste to be disposed of shall be solidified concrete waste;

(c) said solidified concrete waste shall be as specified in paragraph (3).

(2) The technical standards for a waste package are as follows:

(i) to prevent radiation hazards, radioactive waste shall be encased in a container or solidified with a container by the method specified by the Nuclear Regulation Authority;

(ii) the radioactivity concentration shall not exceed the maximum radioactivity concentration stated in the application form.;

(iii) the surface density of radioactive material shall not exceed 10% of the surface density limit as set forth in Article 14, item (i), (c);

(iv) any material that may damage the integrity of the waste package shall not be included;

(v) it shall have enough strength to bear the potential load that may be applied when landfilled;

(vi) there shall be no significant damage;

(vii) a sign of radioactive waste shall be indicated prominently and permanently on the surface of the waste package, and a serial number for cross checking said waste package with the matters stated in the application form set forth in the preceding Article shall also be included.

(3) The technical standards for solidified concrete waste are as follows, with the provisions of paragraph (2), item (ii) applied mutatis mutandis:

(i) explosive materials shall not be contained;

(ii) measures for cross checking said solidified concrete waste with the provisions in the application form set forth in the preceding Article shall have been taken;

(Quality Assurance)

Article 13-3 Pursuant to the provisions of Article 51-16, paragraph (2) of the Act, a licensee of Category 2 waste disposal activity shall draw up a quality assurance plan based on the Operational Safety Programs, and shall organize, carry out, evaluate and improve operational safety activities (including the measures prescribed in Article 14 to Article 19-2) based on the quality assurance plan, and make improvements to the quality assurance plan on an on-going basis.

(Quality Assurance Plan)

Article 13-4: A quality assurance plan shall specify the following matters:

(i) the organization for conducting quality assurance;

(ii) plans for operational safety activities;

(iii) implementation of operational safety activities;

(iv) evaluation of operational safety activities;

(v) improvements in operational safety activities.

(Organization for Conducting Quality Assurance)

Article 13-5: An organization for conducting quality assurance shall be as follows:

(i) the organization is operated by a licensee of Category 2 waste disposal activity (in the case of a corporation, its representative);

(ii) the responsibility, authority, and duties concerning quality assurance are clarified;

(iii) the organization has prepared a mechanism to draw up, implement and evaluate a quality assurance plan and improve the plan on an on-going basis.

(Plans for Operational Safety Activities)

Article 13-6: The matters concerning plans for operational safety activities to be specified in a quality assurance plan shall be as follows:

(i) the processes specified in Q9000 of the Japanese Industrial Standards based on the Industrial Standardization Act (Act No. 185 of 1949) and their correlation are clarified in operational safety activities;

(ii) the mechanism is to be such that quality assurance is conducted based on each stage of organizing, carrying out, evaluating, and improving operational safety activities, and operational safety activities are improved on an on-going basis;

(iii) when procuring goods or services from third parties, the methods of managing them appropriately are to be specified;

(iv) the details of operational safety activities are to be specified in accordance with the significance for operational safety;

(v) procedures for appropriate management of documents and records concerning operational safety activities are to be specified;

(vi) an education and training system for personnel carrying out operational safety activities is to be specified.

(Implementation of Operational Safety Activities)

Article 13-7 The implementation of operational safety activities to be specified in a quality assurance plan shall be as follows:

(i) for individual operational safety activities (hereinafter referred to as "individual duties"), the following procedures are to be followed:

(a) drawing up an implementation plan for individual duties (hereinafter referred to as the "implementation plan"), and clarifying their requirements and goals;

(b) performing individual duties based on the implementation plan; in this case, it should be confirmed at an appropriate stage that said plan complies with requirements;

(c) managing any amendments to the implementation plan appropriately;

(ii) when procuring goods or services from third parties, the relevant person in charge must ensure they are appropriate for the implementation plan (including obtaining technical information on operational safety required for the maintenance and operation of said goods or services),appropriate management methods are adopted and all information is shared, with licensees of Category 1 waste disposal activity and other licensees of Category 2 waste disposal activity);

(iii) to confirm that individual duties comply with the implementation plan requirements, necessary inspections and testing are to be carried out;

(iv) officials carrying out inspections and testing set forth in the preceding item are to be selected in accordance with the significance for operational safety;

(v) When requirements are not complied with (hereinafter referred to as "non-compliance"), the methods of appropriately managing such situation are to be specified.

(Evaluation of Operational Safety Activities)

Article 13-8: The matters concerning the evaluation of operational safety activities in a quality assurance plan shall be as follows:

(i) necessary monitoring and measurement of operational safety activities will be conducted systematically;

(ii) a systematic audit will be conducted to make it clear that operational safety activities are being carried out appropriately;

(iii) the evaluation set forth in the preceding item will be made by someone other than those whose individual duties are to be evaluated.

(Improvements in Operational Safety Activities)

Article 13-9: The matters covering improvements in operational safety activities to be specified in a quality assurance plan shall be as follows:

(i) improvements are to be made by specifying correctional procedures to prevent recurrences of non-compliance (including procedures for conducting analysis to determine root causes of incidents such as accidents and failures set forth in Article 22-17 and hereinafter referred to as "root cause analysis");

(ii) improvements are to be made by specifying prevention procedures to avoid possible non-compliance (hereinafter referred to as “preventive action”) including procedures for root cause analysis;

(iii) in taking preventive action, both information obtained from operational safety activities at one's own waste disposal facilities but alss from other facilities will be included;

(iv) evaluation results from activities outlined in the preceding Article will be reflected appropriately.

(Access to Radiation Controlled Areas)

Article 14: Pursuant to the provisions of Article 51-16, paragraph (2) of the Act, a licensee of Category 2 waste disposal activity shall designate radiation controlled areas and peripheral monitoring areas and will take a series of measures: (they will not apply when such areas are not designated in the operational safety programs for which approval for amendments as set forth in Article 51-18, paragraph (1) of the Act has been obtained).

(i) for radiation controlled areas, the following measures will be taken:

(a) zoning areas will be marked with signs, walls, fences, and other partitions, clearly distinguishing them from surrounding areas, and will include access control or lockup in accordance with radiation risks.;

(b) prohibiting eating, drinking or smoking at locations where there is a risk of oral intake of radioactive material;

(c) ensuring that the surface density of radioactive material on floors, walls and other surfaces with which people come into contact with, does not exceed the surface density limit specified by the Nuclear Regulation Authority;

(d) ensuring that when people leave a radiation controlled area the density of radioactive material on clothing, shoes or on the surface of containers and wrapping of items he/she intends to take out does not exceed 10% of the surface density limit set forth in (c) above;

(ii) for peripheral monitoring areas, the following measures should be taken:

(a) prohibiting people from living in those areas;

(b) limiting the access by people other than those on business by installing fences or boundary signs (this will not apply when it is clear there is no obvious hazard to people)..

(Measures concerning Doses)

Article 15:

(1) Pursuant to the provisions of Article 51-16, paragraph (2) of the Act, a licensee of Category 2 waste disposal activity shall take measures with regard to doses,affecting radiation workers:

(i) ensuring that radiation doses affecting workers do not exceed limits specified by the NRA;

(ii) ensuring that airborne radioactive concentrations in the workplace do not exceed NRA limits.

(2) Irrespective of the provisions of the preceding paragraph, in an unavoidable situation such as a disaster or potential disaster at a waste disposal facility, it may be necessary for personnel to undertake emergency work, providing doses do not exceed limits specified by the NRA (female workers will be restricted to those who are infertile or those who have notified, in writing, the relevant licensee that they have no intention of becoming pregnant).

(Patrol and Checking of Waste Disposal Facilities)

Article 16: Pursuant to the provisions of Article 51-16, paragraph (2) of the Act, a licensee of Category 2 waste disposal activity shall engage personnel to patrol and check the facilities at least once a week under the Operational Safety Programs for which he/she has obtained approval or approval for amendments as set forth in Article 51-18, paragraph (1) of the Act.

(Maintenance of Waste Disposal Sites)

Article 17:

(1) Pursuant to the provisions of Article 51-16, paragraph (2) of the Act, a licensee of Category 2 waste disposal activity shall undertake the following measures for the maintenance of the waste disposal site:

(i) monitoring any leak of radioactive material outside the waste disposal site.When an abnormal leak is found, promptly repairing any relevant equipment at the waste disposal site and taking any needed measures to prevent an abnormal radioactive leak;

(ii) designating a protected area for disposal, clearly distinguishing it from surrounding areas with signs and maintaining the site in good order (excluding measures in the preceding item);

(iii) installing an easily viewable signboard and other indicators at the waste disposal site and updating them when there are any changes in the following areas:

(a) type of radioactive waste;

(b) the dates of starting and completing landfilling;

(c) matters concerning operational safety;

(2) The provisions of the preceding paragraph do not apply to waste disposal facilities for which the approval set forth in Article 51-25, paragraph (2) of the Act has been obtained.

(Transport within the Place of Business)

Article 18:

(1) Pursuant to the provisions of Article 51-16, paragraph (2) of the Act, a licensee of Category 2 waste disposal activity shall take the following measures covering the transport of nuclear fuel material within the place of business of the waste disposal complex:

(i) encasing nuclear fuel material in a container during transportation with the following exceptions:

(a) transporting contaminated materials with a radioactive concentration below NTA-specified limits and for which measures to prevent a radioactive leak have been taken;

(b) when transporting contaminated materials such as large machinery which is difficult to fit into a container, but taking hazard prevention measures approved by the NRA;

(ii) containers described in the preceding item shall conform with the following standards:

(a) the length of each side of the cuboid circumscribed to said container is no shorter than 10 cm;

(b) a container can be handled easily and safely and is not subject to cracks or other damage from temperature changes, internal pressure, or oscillation;

(iii) ensuring that the dose equivalent rates at the surface and at a distance of one meter from the surface of the vessel in which nuclear fuel material is encased..Ensuring the transportation vehicle . (hereinafter referred to as "transporting equipment") will not exceed the dose equivalent rates specified by the NRA ,and the density of radioactive material on the surface of the material to be transported will not exceed 10% of the surface density limit set forth in Article 14, item (i), (c) (when transportation is conducted without encapsulating the contaminated material prescribed in item (i), (a) or (b) in a container, pursuant to the provisions of the proviso to said item, said material contaminated by nuclear fuel material; hereinafter referred to as "material to be transported" in this Article),

(iv) ensuring that the material will not move, fall or drop during loading, transportation and unloading;

(v) ensuring that nuclear fuel material is not loaded onto the same transportation as hazardous

materials specified by the Nuclear Regulation Authority;

(vi) displaying signs, deploying guards at key locations and taking other appropriate measures along the transport route to limit access by people other than those official involved in the movement.;

(vii) reducing the speed of the transportation vehicle and providing a security escort vehicle over long distances;

(viii)Providing an expert in handling nuclear fuel material to accompany and supervise the movement if necessary

(ix) Utilizing NRA-specified labels and signs at critical positions on the materials to be transported and the transporter itself. Containers should be designed to not require reshipment on the way, are strong enough to withstand repeated use and are equipped with devices for easy loading and unloading

(2) As noted in the preceding paragraph, when it is difficult to implement all of the measures set forth in item (ii) and item (iii), it is acceptable to adopt other NRA approved measures, though this would not apply when the dose equivalent rate at the surface of the transported material exceeds NRA specified limits.

(3) The provisions of paragraph (1), item (i) to item (iii) and item (vi) to item (ix) do not apply to transport within the radiation controlled areas.

(4) In the case where a licensee of Category 2 waste disposal activity has taken measures necessary for ensuring security with regard to the transport of nuclear fuel material, according to the technical standards for transport prescribed in Article 3 to Article 17 of the Ministerial Ordinance on Transport of Nuclear Fuel Material. Outside the facility or place of business (Ministerial Ordinance Issued by the Prime Minister's Office No. 57 of 1978) and Article 3 to Article 19 of the Ministerial Ordinance on Transport of Nuclear Fuel Material by Vehicle (Ordinance of the Ministry of Transport No. 72 of 1978), the licensee may conduct the transport of said nuclear fuel material, etc. within the place of business where the waste disposal facilities have been installed, notwithstanding the provisions of paragraph (1).

(Disposal within the Place of Business)

Article 19: Pursuant to the provisions of Article 51-16, paragraph (2) of the Act, a licensee of Category 2 waste disposal activity shall take the following measures with regard to the disposal of radioactive waste within the place of business where the waste disposal facilities have been installed:

(i) ensuring radioactive waste disposal is conducted under the supervision of disposal and radiation protection experts. Appropriate clothese should be worn by workers and officials;

(ii) persons other than those directly engaged in the disposal must follow their instructions at the site;

(iii) disposing of gaseous radioactive waste with either of the following methods:

(a) discharging through the exhaust facilities;

(b) storing disposal waste in tanks that can prevent radiation hazards;

(iv) when adopting the disposal method set forth in (a) of the preceding item, reducing the concentration of radioactive material in the exhaust to the extent possible through filtration, radioactivity decay, dilution with a large amount of air at the exhaust facilities; in this case, monitoring radioactive concentrations in the exhaust system, thereby ensuring that radioactive concentrations in the air outside the peripheral monitoring area will not exceed limits specified by the Nuclear Regulation Authority;

(v) disposing of radioactive liquid waste with any of the following methods:

(a) discharging through the drainage facilities;

(b) storing for disposal in tanks that can prevent radiation hazards;

(c) encasing such waste in a vessel or solidifying it with a vessel and storing said waste for disposal at the storage disposal facilities that can prevent radiation hazards;

(d) incinerating waste to prevent radiation hazards;

(e) solidifying waste in the available solidification equipment;

(f) landfilling waste in accordance with the technical standards prescribed in Article 6 and Article 8;

(vi) when adopting the disposal method set forth in (a) of the preceding item, reducing the concentration of radioactive material in the effluent to the extent possible by way of filtration, evaporation, adsorption using the ion-exchange resin method, radioactivity decay, dilution with a large amount of water at the drainage facilities; in this case, monitoring the concentration of radioactive material in the effluent at the discharge port or effluent monitoring equipment, thereby ensuring that the concentration of radioactive material in the water at the boundary outside the peripheral monitoring area will not exceed the concentration limit specified by the Nuclear Regulation Authority;

(vii) when adopting the disposal method set forth in (c) of item (v) and encapsulating the radioactive waste in a container, said vessel shall conform with the following standards:

(a) the container is resistant to corrosion, less permeable and ablve to prevent leaks of radioactive waste;

(b) the container is free from any cracks or damage;

(c) the container lid is hard to remove;

(viii)when adopting the disposal method set forth in (c) of item (v) and solidifying radioactive waste with a container, the vessel integrally solidified with the radioactive waste will be able to prevent a scatter or leak of radioactive waste;

(ix) when adopting the disposal method set forth in (c) of item (v) and storing disposable radioactive waste at the storage facilities to prevent radiation hazards, the following procedures will be followed:

(a) when encapsulating the waste in a container and storing it for disposal, taking measures necessary to prevent the spread of contamination in the event of any cracks or damage to said container, such as covering said container with materials that can absorb the waste or installing a tray that can receive the encapsulated radioactive waste;

(b) attaching a radioactive waste sign to a container in which the radioactive waste is encapsulated or which has solidified with the radioactive waste, and indicating a serial number for cross checking said radioactive waste with the details recorded based on the provisions of Article 13;

(c) posting precautions for management in a prominent place at said storage facilities;

(x) when adopting the disposal method in item (v), monitoring the concentration of radioactive material in underground water to ensure that at the boundary outside the peripheral monitoring area it does not exceed the concentration limit in item (vi);

(xi) disposing of solid radioactive waste by any of the following methods:

(a) incinerating waste to prevent radiation hazards;

(b) encapsulating waste in a container or solidifying it with a container and storing said waste for disposal at the storage disposal facilities;

(c) with regard to large machinery for which it is extremely difficult to adopt the disposal method in (b) above, or radioactive waste that requires radioactivity decay, storing such waste for disposal at the storage facilities;

(d) landfilling waste in accordance with the technical standards prescribed in Articles 6 and 8;

(xii) The provisions of item (vii), item (viii) and item (ix) (excluding (a) of said item) shall apply mutatis mutandis with regard to disposal by the method set forth in (b) of the preceding item;

(xiii) The provisions of (c) of item (ix) shall apply mutatis mutandis with regard to disposal by the method set forth in (c) of item (xi);

(xiv) The provisions of item (x) shall apply mutatis mutandis with regard to disposal by the method set forth in (d) of item (xi).

(Periodic Evaluation of Waste Disposal Facilities)

Article 19-2:

(1) Pursuant to the provisions of Article 51-16, paragraph (2) of the Act, a licensee of Category 2 waste disposal activity shall use the measures set forth in the following items for each waste disposal site at intervals of not exceeding ten years:

(i) evaluating the management of radiation exposure due to nuclear fuel material based on the latest technical knowledge;

(ii) taking measures to protect waste disposal facilities based on the results of the evaluation outlined in the preceding item.

(2) In addition to measures prescribed in the preceding paragraph, a licensee of Category 2 waste disposal activity shall utilize measures outlined in the preceding paragraph for the waste disposal site when he/she intends to change the measures to be taken for the operational safety of Category 2 waste disposal in accordance with the attenuation of radioactivity.

(3) The provisions of the preceding two paragraphs do not apply to waste disposal facilities for which approval in Article 51-25, paragraph (2) of the Act has been obtained.

(Operational Safety Programs)

Article 20:

(1) A person (limited to a licensee of Category 2 waste disposal activity) who seeks approval for Operational Safety Programs under Article 51-18, paragraph (1) of the Act shall specify the Operational Safety Programs concerning the following matters for each place of business for which he/she intends to obtain the approval, and shall submit an application form containing said Operational Safety Programs to the Nuclear Regulation Authority:

(i) the matters concerning the system for complying with relevant laws and regulations, as well as the Operational Safety Programs (including senior management involvement);

(ii) the system for developing a culture of safety (including senior management involvement);

(iii) quality assurance of the waste disposal facilities (including the method and system for conducting root cause analysis and positioning of the procedural manuals in the Operational Safety Programs);

(iv) the duties of those engaged in the operation and management of the waste disposal facilities and their organization (excluding what is set forth in the following item);

(v) the duties and authority of chief engineers of radioactive waste, necessary for supervising operational safety, and their positions in the organization;

(vi) education on operational safety for radiation worker at the waste disposal facilities:

(a) policies to provide education on operational safety (including the drawing up of an implementation plan);

(b) the following matters concerning the details of education on operational safety:

1.compliance with appropriate laws and regulations, as well as Operational Safety Programs;

2. the structure, functions, and operation of the waste disposal facilities;

3. radiation control;

4. handling of nuclear fuel material and material contaminated by nuclear fuel;

5. actions to be taken in an emergency;

(c) other matters necessary for education on operational safety pertaining the waste disposal facilities;

(vii) measures to be taken for the operational safety of Category 2 waste disposal in accordance with the attenuation of radioactivity;

(viii)the specification of the radiation controlled areas, peripheral monitoring areas and protection areas for disposal, as well as the access control to these areas;

(ix) the exhaust monitoring equipment and effluent monitoring equipment;

(x) monitoring of doses, dose equivalents, concentration of radioactive material, and density of radioactive material on the surface of material contaminated by radioactive material, as well as the removal of contamination;

(xi) monitoring the waste disposal site and the nearby vicinity (excluding the monitoring described in item (x)) to obtain information necessary for the periodic evaluation of the waste disposal

facilities under Article 19-2;

(xii) the management of radiation detectors and measurement methods;

(xiii) the policing of waste disposal facilities and accompanying actions;

(xiv) the reception, transportation, disposal and other handling of radioactive waste;

(xv) actions to be taken in an emergency;

(xvi) handing of records and reports on operational safety pertaining to the waste disposal facilities (including the status of compliance with the Operational Safety Programs). Such reports include ones submitted to senior management following incidents such as accidents and failures set forth in the items of Article 22-17;

(xvii) periodic evaluation of waste disposal facilities;

(xviii) sharing with other Category 1 licensees of waste disposal activity and licensees of Category 2 waste disposal activity technical information on operational safety obtained by operator during maintenance checks;

(xix) information disclosure on non-compliance if any;

(xx) other matters necessary for operational safety pertaining to waste disposal facilities.

(2) A person (limited to a licensee of Category 2 waste disposal activity) who intends to seek approval as set forth in Article 51-25, paragraph (2) of the Act shall add the following matters to the Operational Safety Programs approved under Article 51-18, paragraph (1) of the Act or obtain approval for the amended Operational Safety Programs, for the purpose of taking the decommissioning measures specified in the decommissioning plan for which he/she intends to obtain said approval, no later than the date of said approval. The same applies when intending to further amend said amended Operational Safety Programs:

(i) the matters concerning the system for complying with the relevant laws and regulations, as well as the Operational Safety Programs (including senior management involvement);

(ii) the system for developing a safety culture (including senior management involvement);

(iii) quality assurance of the waste disposal facilities (including issues concerning the method and system for conducting root cause analysis, and positioning of the procedure manuals, in the Operational Safety Programs);

(iv) quality assurance of the decommissioning measures (including matters concerning the method and system for conducting root cause analysis, and positioning of the procedure manuals in the Operational Safety Programs);

(v) the duties of those engaged in the decommissioning measures and their organization (excluding the situation set forth in the following item);

(vi) the duties and authority of chief engineers of radioactive waste, necessary to supervise operational safety, and their positions in the organization;

(vii) education on operational safety for radiation workers engaged in decommissioning:

(a) matters concerning policies for providing education on operational safety including the drawing up of an implementation plan

(b) the following matters concerning the details of education on operational safety:

1. compliance with relevant laws and regulations, as well as Operational Safety Programs;
2. the structure and functions of the spent fuel interim storage facilities;
3. decommissioning measures for auxiliary facilities of the waste disposal site;
4. radiation control;
5. handling of nuclear fuel material and material contaminated by nuclear fuel material;
6. actions to be taken in an emergency;

(c) other matters necessary for education on operational safety pertaining the waste disposal facilities;

(viii) measures to be taken for the operational safety of Category 2 waste disposal in accordance with the attenuation of radioactivity;

(ix) the specification of radiation controlled areas, peripheral monitoring areas and protection areas for disposal, as well as the access control to these areas;

(x) exhaust monitoring and effluent monitoring equipment;

(xi) monitoring of doses, dose equivalents, concentration of radioactive material, and density of radioactive material on the surface of material contaminated by radioactive material, as well as the decontamination;

(xii) management of radiation detectors and measurement methods;

(xiii) the policing of waste disposal facilities and related actions;

(xiv) the transport, disposal and other handling of radioactive waste;

(xv) actions to be taken in an emergency;

(xvi) maintaining proper records and reports on operational safety at waste disposal facilities (including the status of compliance with the Operational Safety Programs). Such reports include ones made to senior management on accidents, failures and other incidentsset forth in the items of Article 22-17,;

(xvii) maintenance of proper records and reports on operational safety covering decommissioning measures (including the status of compliance with the Operational Safety Programs). Such reports include ones made to senior management for accidents, failures and other incidents set forth in the items of Article 22-17;

(xviii) sharing with other Category 1 licensees of waste disposal activity and licensees of Category 2 waste disposal activity technical information on operational safety obtained by operators during maintenance and checks;

(xix) the matters concerning the information disclosure on non-compliance if any;

(xx) management of decommissioning measures;

(xxi) other matters necessary for operational safety of waste disposal facilities or decommissioning measures.

(3) A person who intends to obtain approval for amendments to the matters set forth in paragraph (1), item (vii) with regard to the Operational Safety Programs for which he/she has obtained approval or approval for amendments as set forth in Article 51-18, paragraph (1) of the Act, shall submit an application form

as set forth in paragraph (1) or paragraph (2), together with a document explaining the results of the periodic evaluation of the waste disposal facilities under Article 19-2.

(4) The provisions of the main clause of paragraph (1) apply mutatis mutandis in the cases set forth in paragraph (2).

(5) One original copy of the application form set forth in paragraph (1) (including the cases where said paragraph is applied mutatis mutandis pursuant to the preceding paragraph) shall be submitted.

(Inspection of the Status of Compliance with the Operational Safety Programs)

Article 20-2:

(1) An inspection (limited to the inspection pertaining to Category 2 waste disposal activity) under Article 51-18, paragraph (5) of the Act is to be conducted four times every year; provided, however, that the inspection for the waste disposal facilities for which approval as set forth in Article 51-25, paragraph (2) of the Act has been obtained, it is to be conducted four times or less every year, in accordance with the progress of the decommissioning measures.

(2) The matters concerning the inspection set forth in the preceding paragraph which are specified by the Ordinance of the NRA as set forth in Article 12, paragraph (6) of the Act as applied mutatis mutandis pursuant to Article 51-18, paragraph (6) of the Act shall be as follows:

(i) entering the office, facility or place of business;

(ii) inspecting books, documents, equipment, components, or any other necessary property;

(iii) questioning employees and other people concerned;

(iv) requesting the submission of nuclear source material, nuclear fuel material, material contaminated by nuclear fuel material, or any other necessary samples (limited to the minimum amount necessary for testing).

(Physical Protection Programs)

Article 22-2:

(1) A person (limited to a licensee of Category 2 waste disposal activity) who intends to seek approval for Physical Protection Programs under Article 51-23, paragraph (1) of the Act shall specify the Physical Protection Programs concerning the following matters for each place of business for which he/she intends to seek the approval, and shall submit an application form containing said Physical Protection Programs to the Nuclear Regulation Authority:

(i) the matters concerning the system for complying with relevant laws and regulations, as well as the Physical Protection Programs (including senior management involvement);

(ii) the system for developing a security culture (including senior management involvement);

(iii) the duties of those engaged in the physical protection of specified nuclear fuel material and their organization;

(iv) the specifications of the physical protection areas, access to controlled areas and patrolling and monitoring. (for the place of business handling the specified nuclear fuel material set forth in item

(i) or item (ii) of the table of Article 19-3, paragraph (1), the physical protection areas and peripheral physical protection areas; the same applies in the following item) ;

(v) access control to the physical protection areas;

(vi) management of specified nuclear fuel material;

(vii) measures for maintaining equipment or devices necessary for the physical protection of specified nuclear fuel material;

(viii) an information system security plan;

(ix) maintenance and inspection of equipment and devices necessary for the physical protection of specified nuclear fuel material;

(x) responses in an emergency;

(xi) the development of a communication system;

(xii) management of information on measures to physically protect specified nuclear fuel material;

(xiii) education and training to ensure the physical protection of specified nuclear fuel material;

(xiv) an emergency response plan for waste disposal facilities;

(xv) measures to be taken in response to the threats such as sabotage (limited to the matters falling under Article 19-3, paragraph (2), item (xxiii) (including the cases where said item is applied mutatis mutandis pursuant to paragraph (3) and paragraph (4) of said Article));

(xvi) periodic evaluation and improvements necessary for the physical protection of specified nuclear fuel material;

(xvii) records on the physical protection of specified nuclear fuel material at waste disposal facilities (including the status of compliance with the Physical Protection Programs);

(xviii) other matters necessary for the physical protection of specified nuclear fuel material at waste disposal facilities.

(2) One original copy and one duplicate copy of the application form set forth in the preceding paragraph shall be submitted (when filing an application for any of the waste disposal facilities set forth in item (iv) of the table of Article 63, paragraph (1) of the Order that is specified by the Nuclear Regulation Authority in a public notice, one original copy and two duplicate copies of the application form).

(Inspection of the Status of Compliance with Physical Protection Programs)

Article 22-3:

(1) An inspection (limited to the inspection pertaining to Category 2 waste disposal activity) under Article 12-2, paragraph (5) of the Act as applied mutatis mutandis pursuant to Article 51-23, paragraph (2) of the Act is to be conducted once every year.

(2) The matters concerning the inspection set forth in the preceding paragraph which are specified by the NRA Ordinance as set forth in Article 12-2, paragraph (6) of the Act as applied mutatis mutandis pursuant to Article 51-23, paragraph (2) of the Act shall be as follows:

(i) entering the office, facility or place of business;

(ii) inspecting books, documents, equipment, components, or any other necessary property;

(iii) questioning employees and other people concerned;

(iv) requesting the submission of specified nuclear fuel material or any other necessary samples (limited to the minimum amount necessary for testing).

(Application for Approval of Decommissioning Plans)

Article 22-7

(1) A person (limited to a licensee of Category 2 waste disposal activity) who intends to seek approval for a plan concerning decommissioning measures (hereinafter referred to as a "decommissioning plan"), pursuant to the provisions of Article 51-25, paragraph.

(2) of the Act, shall draw up a decommissioning plan based on the following items and submit an application form containing said plan to the Nuclear Regulation Authority:

(i) to (vii) (omitted)

(2) The following documents or drawings shall be attached to the application form described in the preceding paragraph:

(i) to (x) (omitted)

(3) One original and one duplicate copy of the application form set forth in paragraph (1) shall be submitted.

(Standards for Approval of Decommissioning Plans)

Article 22-10: The standards (limited to Category 2 waste disposal activity) specified by the NRA Ordinance as prescribed in Article 12-6, paragraph (4) of the Act as applied mutatis mutandis pursuant to Article 51-25, paragraph (3) of the Act shall be as follows:

(i) the period for implementing the measures prescribed in Article 51-2, paragraph (2), item (v) of the Act has elapsed;

(ii) there is no need to take the measures prescribed in Article 17, paragraph (1):

(iii) the management, processing, and disposal of nuclear fuel material has been conducted in an appropriate manner;

(iv) the implementation of the decommissioning measures is appropriate to prevent disasters that may be caused by nuclear fuel material.

(Application for Confirmation of the Completion of Decommissioning Measures)

Article 22-11:

(1) A person (limited to a licensee of Category 2 waste disposal activity) who intends to apply for confirmation of the completion of the decommissioning measures, pursuant to the provisions of Article 12-6, paragraph (8) of the Act as applied mutatis mutandis pursuant to Article 51-25, paragraph (3) of the Act, shall submit an application form containing the matters set forth in the following items to the Nuclear Regulation Authority:

(i) to (v) (omitted)

(2) A document containing the following issues shall be attached to the application form set forth in the preceding paragraph:
(i) and (ii) (omitted)
(3) One original copy and one duplicate copy of the application form set forth in paragraph (1) shall be submitted.

(Standards for Confirmation of the Completion of Decommissioning Measures)
Article 22-12: The standards (limited to those pertaining to Category 2 waste disposal activity) specified by the NRA Ordinance in Article 12-6, paragraph (8) of the Act as applied mutatis mutandis pursuant to Article 51-25, paragraph (3) of the Act shall be as follows:
(i) there is no need to take any measures to prevent radiation hazards with regard to the soil in the premises of the auxiliary facilities under decommissioning measures and facilities remaining in said premises;
(ii) the disposal of the nuclear fuel material has been completed;
(iii) the handover of the radiation control records prescribed in Article 13, paragraph (1) to an organization designated by the Nuclear Regulation Authority set forth in paragraph (5) of said Article has been completed.

(Report of Accidents and Failures)
Article 22-17: When experiencing any of the following situations, a licensee of Category 2 waste disposal activity (including former licensees of Category 2 waste disposal activity; hereinafter the same applies in the following Article and Article 27) shall immediately inform the Nuclear Regulation Authority of such fact, and make a report on the situation thereof and actions to be taken, within ten days, pursuant to the provisions of Article 62-3 of the Act:
(i) when any nuclear fuel material has been stolen or has gone missing;
(ii) in the event of a failure of the waste disposal facilities and when special measures are required for repair work for said failure, and this has interrupted the Category 2 waste disposal;
(iii) when a failure of the waste disposal facilities has interrupted or might interrupt Category 2 waste disposal by losing the ability to confine nuclear fuel material in a limited area, losing the ability to prevent radiation hazards due to external radiation, and the function for preventing a fire or explosion at the waste disposal facilities;
(iv) when a failure or other unexpected event in the waste disposal facilities has caused any abnormalities in discharging gaseous radioactive waste through the exhaust facilities or discharging radioactive liquid waste through the drainage facilities;
(v) where gaseous radioactive waste has been discharged through the exhaust facilities, and when the concentration of radioactive material in the air outside the peripheral monitoring area has exceeded the limit in Article 19, item (iv);
(vi) when the concentration of radioactive material in the water at the boundary outside the peripheral

monitoring area has exceeded the concentration limit in Article 19, item (vi);

(vii) when any nuclear fuel material has leaked outside the radiation controlled area;

(viii)when a failure or other unexpected event in the waste disposal facilities has caused a leak of nuclear fuel material within the radiation controlled area. Situations falling under any of the following are excluded from the above (excluding the cases where measures have been newly taken to limit access or secure the place where the leak occurred or where the leaked material has spread to outside the radiation controlled area):

(a) when leaked liquid nuclear fuel material, has not spread to outside the weir and measures have been taken to contain the spread of any leak;

(b) where gaseous nuclear fuel material has leaked, but where ventilators keep functioning properly;

(c) when the amount of radiation of the leaked nuclear fuel material. is small or when the leak is otherwise minor;

(ix) when a failure or other unexpected event in the waste disposal facilities has exposed nearby personnel to doses which have exceeded, or may possibly exceed, 5mSv for radiation workers or 0.5mSv for other people;

(x) when any worker has been exposed to radiation that exceeds or may possibly exceed the dose limit set forth in Article 15, paragraph (1), item (i);

(xi) in addition to the preceding items, when any hazard (excluding hazards other than radiation hazards that do not require hospital treatment) has occurred or may possibly occur to people in relation to the waste disposal facilities.

(Emergency Measures)

Article 23: Pursuant to the provisions of Article 64, paragraph (1) of the Act, a licensee of Category 2 waste disposal activity shall take the following emergency measures:

(i) where a fire has occurred at a waste disposal facility or there is a risk of fire spreading to the waste disposal facilities, extinguishing or preventing the spread of a fire and immediately reporting the situation to fire authorities;

(ii) where there is enough time, moving nuclear fuel material to asafe place if necessary and barring access to people other than those workers and guards enganged in roping off the area and establishing warning signs.

(iii) warning nearby people to evacuate if necessary to avoid radiation hazards;

(iv) preventing the spread of a contamination outbreak caused by nuclear fuel material and and removing the contaminant;

(v) where a person has received or may have possibly received radiation exposure, promptly rescuing and evacuating said person;

(vi) taking other necessary measures to prevent radiation hazards.

Table H1-2 Ordinance on Activity of Waste Interim Storage/Treatment of Nuclear Fuel Material and

Materials Contaminated by Nuclear Fuel Material (Excerpt)

(Application for Permission for Radioactive Waste Storage Activity)

Article 2: Statements in an application form (limited to an application form pertaining to radioactive waste storage activity) set forth in Article 51-2, paragraph (2) of the Act on the Regulation of Nuclear Source Material, Nuclear Fuel Material and Reactors (hereinafter referred to as the "Act") shall be as follows:

(i) with regard to the property and quantity of the nuclear fuel material. set forth in Article 51-2, paragraph (2), item (iii) of the Act, entering the type and quantity of radioactive waste subject storage, and the maximum radioactivity concentration and total amount of radioactivity for each type of radioactive material contained in said radioactive waste;

(ii) with regard to the location, structure and equipment of waste storage facilities set forth in Article 51-2, paragraph (2), item (iv) of the Act, entering data in accordance with the following classification:

a. to g. (omitted)

(iii) with regard to the disposal method set forth in Article 51-2, paragraph (2), item (iv) of the Act, entering data in accordance with the following classification:

a. and b. (omitted)

(iv) with regard to the construction plan for waste storage facilities set forth in Article 51-2, paragraph (2), item (vi) of the Act, entering the sequence and schedule of the construction work.

(2) A written business plan and other documents specified by the Ordinance of the Nuclear Regulation Authority (hereinafter referred to as the "Ordinance of the NRA") as prescribed in Article 30, paragraph (2) of the Order for Enforcement of the Act on the Regulation of Nuclear Source Material, Nuclear Fuel Material and Reactors (hereinafter referred to as the "Order") that shall be attached to the application form set forth in the preceding paragraph shall be as follows:

(i) to (ix) (omitted)

(3) One original copy and one duplicate copy of the application form set forth in paragraph (1) are to be submitted.

(Application for Approval for the Design and Construction Methods)

Article 4

(1) A person who intends to seek approval for the design and construction methods concerning the specified waste storage facilities (excluding a welding method pertaining to specified waste storage facilities prescribed in Article 11 for which welding is to be performed; hereinafter the same applies in this Article and the following Article) pursuant to the provisions of Article 51-7, paragraph (1) of the Act shall submit an application form containing the matters set forth in the following items:

(i) to (v) (omitted)

(2) An application form set forth in the preceding paragraph shall be attached with documents explaining why the design and construction methods in said application conform with the technical standards set

forth in Article 51-7, paragraph (3), item (ii) of the Act (hereinafter referred to as the "technical standards for the design and construction methods" in this Article and the following Article), other documents explaining the design and construction methods pertaining to said application and why they conform with the technical standards for the design and construction methods, and documents explaining that the quality control method for the design and construction pertaining to said application conforms with the technical standards set forth in item (iii) of said paragraph.

(3) When it is impossible to file an application for approval under Article 51-7, paragraph (1) of the Act at one time with regard to the design and construction methods as a whole, the applicant may file an application by splitting the design and construction methods, while attaching the reason therefor.

(4) One original copy of the application form set forth in paragraph (1) shall be submitted.

(Application for Pre-service Inspection)

Article 7

(1) A person who intends to undergo an inspection with regard to the construction work of the specified waste storage facilities (excluding a welding method pertaining to specified waste storage facilities prescribed in Article 11 for which welding is to be performed) and the performance thereof pursuant to the provisions of Article 51-8, paragraph (1) of the Act shall submit an application form containing the matters set forth in the following items::

(i) to (v) (omitted)

(2) When the applicant has changed any of the information stated in the application form set forth in the preceding paragraph, he/she shall make a notification to that effect promptly.

(3) One original copy shall be submitted with regard to the application form set forth in paragraph (1) and the document pertaining to the notification set forth in the preceding paragraph.

(Implementation of Pre-service Inspection)

Article 8: A pre-service inspection as set forth in Article 51-8, paragraph (1) of the Act (limited to the inspection pertaining to specified waste storage facilities; the same applies hereinafter) shall be conducted for the following items at the times prescribed therein:

(i) matters concerning radiation shielding material, materials requiring airtightness or water-tightness: at the time when conducting chemical analysis tests, non-destructive tests, mechanical tests, pressure tests, or leakage tests or at any other time that the Nuclear Regulation Authority finds appropriate;

(ii) the assembly of the main body of the waste storage equipment, facilities for accepting radioactive waste, or other auxiliary facilities of the waste storage equipment (limited to disposal facilities): when the size of major parts of the respective facilities can be measured, or at the time when conducting non-destructive tests, mechanical tests, pressure tests, or leakage tests;

(iii) the assembly of measurement and control facilities, radiation control facilities or other auxiliary facilities of the waste storage equipment (excluding disposal facilities): when the relevant

facilities are completed;

(iv) the performance of the waste storage facilities: when the waste storage facilities are completed, or at any other time that the Nuclear Regulation Authority finds appropriate.

(Specified Waste Storage Facilities Subject to Welding Inspection)

Article 11: Waste storage facilities specified by the Ordinance of the NRA set forth in Article 51-9, paragraph (1) of the Act are as follows:

(i) vessels or pipes that contain liquid or gaseous material including plutonium or plutonium compound and fall under either of the following:

(a) vessels that contain plutonium with a concentration of 37μBq/cm3 or more (when containing liquid material, 37Bq/cm3 or more) and whose maximum operating pressure is 98kPa or more or whose internal volume exceeds 0.04m3;

(b) pipes that contain plutonium with a concentration of 37μBq/cm3 or more (when containing liquid material, 37Bq/cm3 or more) and whose outside diameter exceeds 61mm (for pipes whose maximum operating pressure is less than 98kPa, whose outside diameter exceeds 100mm) (excluding ducts installed within the area confining radioactive material and whose internal pressure is maintained at a lower level than the external pressure);

(ii) vessels or pipes that contain liquid or gaseous material including radioactive material (excluding those prescribed in the preceding item) and fall under either of the following:

(a) vessels that contain radioactive material with a concentration of 37mBq/cm3 or more (when containing liquid material, 37kBq/cm3 or more) and whose maximum operating pressure is 98kPa or more or whose internal volume exceeds 0.04m3;

(b) pipes that contain radioactive material with a concentration of 37mBq/cm3 or more (when containing liquid material, 37kBq/cm3 or more) and whose outside diameter exceeds 61mm (for pipes whose maximum operating pressure is less than 98kPa, whose outside diameter exceeds 100mm) (excluding ducts installed within the area confining radioactive material and whose internal pressure is maintained at a lower level than the external pressure);

(iii) vessels with a maximum diameter exceeding 150mm or pipes with a diameter exceeding 150mm (excluding the vessels or pipes prescribed in the preceding items) that contain liquid or gaseous material including radioactive material or belong to emergency facilities, and whose parts to which pressures as specified as follows or larger are applied (hereinafter referred to as the "pressure parts") are to be welded:

(a) for vessels or pipes for liquid whose maximum operating temperature is lower than the boiling point of said liquid, a maximum operating pressure of 1960kPa;

(b) for vessels other than those prescribed in (a) above, a maximum operating pressure of 98kPa;

(c) for pipes other than those prescribed in (a) above, a maximum operating pressure of 980kPa (for longitudinal joints, a maximum operating pressure of 490kPa).

(Application for Welding Inspection)

Article 12:

(1) A licensee who intends to undergo an inspection with regard to welding the specified waste storage facilities pursuant to the provisions of Article 51-9, paragraph (1) of the Act shall submit an application containing the following information to the Nuclear Regulation Authority:

(i) to (v) (omitted)

(2) The following documents shall be attached to an application form set forth in the preceding paragraph:

(i) to (iii) (omitted)

(3) When the person has changed any of the information contained in the original application set forth in paragraph (1) or the documents set forth in the preceding paragraph, he/she shall make a prompt notification to that effect.

(4) One original copy shall be submitted with regard to the application form set forth in paragraph (1) and the document pertaining to the notification set forth in the preceding paragraph.

(Implementation of Welding Inspection)

Article 13 A welding inspection as set forth in Article 51-9, paragraph (1) of the Act (limited to an inspection pertaining to specified waste storage facilities) shall be conducted in line with the timing set forth in the following items:

(i) when a welding is performed (excluding cases pertaining to seal welding for vessels or pipes set forth in Article 11, item (iii) and the cases where the Nuclear Regulation Authority approves, recognizing that there is no problem in light of the conditions of the standardization of welding operation and materials used for welding);

(ii) with regard to welded parts for which a non-destructive test is required based on the technical standards prescribed in Article 51-9, paragraph (3), item (ii) of the Act (hereinafter referred to as the "technical standards for welding"), when it has become possible to carry out a non-destructive test;

(iii) with regard to butt-welded parts for which a mechanical test is required based on the technical standards for welding, when it has become possible to carry out a mechanical test;

(iv) when it has become possible to carry out a pressure test or leakage test (excluding the cases pertaining to seal welding for vessels or pipes set forth in Article 11, item (iii)).

(Cases where Welding Inspection is not Required)

Article 14 The cases (limited to those pertaining to specified waste storage facilities) specified by the Ordinance of the NRA set forth in the proviso to Article 51-9, paragraph (1) of the Act shall be as follows:

(i) with regard to vessels or pipes belonging to major experimental equipment, auxiliary facilities of the waste storage equipment prescribed in Article 2, paragraph (1), item (ii), (h), which are installed inside a cell, glove box or other airtight equipment, the case where the Nuclear

Regulation Authority approved, in advance, the use thereof without undergoing a welding inspection, recognizing that the use of such vessels or pipes will not pose any problem;

(ii) the case of using vessels or pipes as prescribed in Article 11, item (iii) for which only seal welding was performed (including such vessels or pipes for which welding is newly performed for their pressure parts).

(Approval for Welding Method)

Article 15:

(1) An applicant (limited to a licensee of radioactive waste storage activity) who intends to seek approval set forth in Article 51-9, paragraph (2) of the Act shall submit an application containing the matters set forth in the following items with regard to each welding work:

(i) to (v) (omitted)

(2) Documents explaining the matters set forth in the following items shall be attached to the application form:

(i) to (iii) (omitted)

(3) When the Nuclear Regulation Authority finds that the welding method, for which an application for approval set forth in paragraph (1) has been filed and conforms with all of the following, it shall grant the approval set forth:

(i) the type and capacity of the welding equipment are appropriate for the welding method contained in the application;

(ii) the welding method is appropriate for ensuring the strength of the welded parts;

(iii) a person who performs any welding is an expert in the welding method that he/she intends to perform.

(4) One original copy of the application form set forth in paragraph (1) is to be submitted.

(Welding Inspection of Imported Goods)

Article 16:

(1) A person who intends to undergo an inspection of welding of imported specified waste storage facilities for which he/she performed the welding pursuant to the provisions of Article 51-9, paragraph (4) of the Act, shall submit an application form with the following items to the Nuclear Regulation Authority:

(i) to (iv) (omitted)

(2) The following documents shall be attached to said application form:

(i) to (iv) (omitted)

(3) When the person has altered any of the information in the application set forth in paragraph (1) or the documents set forth in the preceding paragraph, he/she shall make a notification to that effect promptly.

(4) One original copy is to be submitted with regard to the application form set forth in paragraph (1) and

the document pertaining to the notification set forth in the preceding paragraph.

(Specified Waste Storage Facilities Subject to Periodic Facility Inspection)

Article 18 Auxiliary facilities of the waste storage equipment specified by the Ordinance of the NRA set forth in Article 35, item (ii) of the Order shall be as follows:

(i) disposal facilities;

(ii) emergency power systems.

(Application for Periodic Facility Inspection)

Article 19:

(1) A person who intends to undergo an inspection of waste storage facilities set forth in Article 35, item (ii) of the Order pursuant to the provisions of Article 51-10, paragraph (1) of the Act shall submit an application form containing the matters set forth in the following items:

(i) to (iii) (omitted)

(2) When the person has changed any of the information in the application form set forth in the preceding paragraph, he/she shall make a prompt notification to that effect.

(3) One original copy of the application set forth in paragraph (1) will be submitted together with the document pertaining to the notification set forth in the preceding paragraph.

(Implementation of Periodic Facility Inspection)

Article 20: The interval (limited to the interval pertaining to radioactive waste storage activity) specified by the Ordinance of the NRA set forth in Article 51-10, paragraph (1) of the Act shall be one year.

(Quality Assurance)

Article 26-3: Pursuant to the provisions of Article 51-16, paragraph (3) of the Act, a licensee of a waste storage activity shall draw up a quality assurance plan based on the Operational Safety Programs, and shall organize, carry out, evaluate and improve operational safety activities (including the measures prescribed in Article 27 to Article 33-2) based on the quality assurance plan, and make improvements to said quality assurance plan on an on-going basis.

(Quality Assurance Plan)

Article 26-4: A quality assurance plan shall specify the following matters:

(i) the organization for conducting quality assurance;

(ii) plans for operational safety activities;

(iii) implementation of operational safety activities;

(iv) evaluation of operational safety activities;

(v) improvements in operational safety activities.

(Organization for Conducting Quality Assurance)

Article 26-5: An organization for conducting quality assurance shall be as follows:

(i) the organization is operated by a licensee of waste storage activity (in the case of a corporation, its representative);

(ii) the responsibility, authority, and duties concerning quality assurance are clarified;

(iii) the organization has prepared a mechanism to draw up, implement and evaluate a quality assurance plan and make improvements to the plan on an on-going basis.

(Plans for Operational Safety Activities)

Article 26-6: The matters concerning plans for operational safety activities to be specified in a quality assurance plan shall be as follows:

(i) the processes specified in Q9000 of the Japanese Industrial Standards based on the Industrial Standardization Act (Act No. 185 of 1949) and their correlation are clarified in operational safety activities;

(ii) the mechanism is to be such that quality assurance is conducted based on each stage of organizing, carrying out, evaluating, and improving operational safety activities, and operational safety activities are improved on an on-going basis;

(iii) when procuring goods or services from third parties, the methods to appropriately manage them will be specified;

(iv) the details of operational safety activities are to be specified in accordance with operational safety;

(v) procedures for appropriate management of documents and records concerning operational safety activities will be specified;

(vi) an education and training system for persons carrying out operational safety activities will be specified.

(Implementation of Operational Safety Activities)

Article 26-7: The matters concerning the implementation of operational safety activities in a quality assurance plan shall be as follows:

(i) for individual duties in operational safety activities (hereinafter referred to as "individual duties"), the following procedures will be followed:

(a) drawing up an implementation plan for individual duties (hereinafter referred to as the "implementation plan" in this Article), while clarifying the individual's goals and requirements;

(b) performing individual duties based on the implementation plan; in this case, it should be confirmed at an appropriate stage that said plan complies with the requirements;

(c) managing the details of any amendment to the implementation plan;

(ii) when procuring goods or services from third parties, the person in charge will oversee a

procurement appropriate for the implementation plan (including obtaining technical information on operational safety),for the maintenance and operation of said goods or services,,for sharing such information with other licensees of waste storage activities and applying appropriate management methods;

(iii) to confirm that individual duties comply with the requirements of the implementation plan, inspections and testing will be spelled out and implemented;

(iv) persons carrying out inspections and testing will be chosen in accordance with the needs of operational safety;

(v) In the event of non compliance (hereinafter referred to as "non-compliance"), the methods of appropriately handling such situation will be specified.

(Evaluation of Operational Safety Activities)

Article 26-8: The evaluation of operational safety activities will be specified in a quality assurance plan as follows:

(i) monitoring and measurement will be conducted systematically in line with the implementation of operational safety activities;

(ii) an audit will be conducted to make it clear that operational safety activities are being carried out appropriately;

(iii) the evaluation set forth in the preceding item will be made by someone other than persons whose performance is being evaluated.

(Improvements in Operational Safety Activities)

Article 26-9: Improvements in operational safety activities in a quality assurance plan shall be as follows:

(i) improvements will be made by specifying correction procedures to prevent the recurrence of non-compliance (including conducting analysis to determine root causes of incidents such as accidents and failures set forth in the items of Article 35-16, and others (hereinafter referred to as "root cause analysis"));

(ii) improvements are to be made by specifying procedures to avoid possible non-compliance (hereinafter referred to as “preventive action”) including procedures for root cause analysis);

(iii) in taking preventive action, knowledge obtained through operational safety activities at one's own waste storage facilities but also the experience of other facilities will be reflected;

(iv) The results of the evaluation from the preceding Article will be reflected.

(Access Control to Radiation Controlled Areas)

Article 27; Pursuant to the provisions of Article 51-16, paragraph (3) of the Act, a licensee of waste storage activity shall designate radiation controlled areas and peripheral monitoring areas and take the following measures in these areas:

(i) for radiation controlled areas, the following measures are to be taken:

(a) zoning areas with walls, fences and other partitions, signs, access control and lock-up facilities in accordance with radiation risks clearly distinguish these areas from others;

(b) prohibiting eating, drinking and smoking at locations where there is a risk of oral intake of radioactive material;

(c) ensuring that the surface density of radioactive material on floors, walls, or other surfaces which people may come into contact with do not exceed limits specified by the NRA;

(d) ensuring that the density of radioactive material on the clothing, shoes and other items of a person leaving a controlled area does not exceed 10% of the surface density limit set forth in © above (when said articles are in a container or wrapped their surface area will be measured);

(ii) for peripheral monitoring areas, the following measures are to be taken:

(a) prohibiting people from living in said areas;

(b) limiting public access to a peripheral monitoring area by means of fences and signs except for personnel on business. This does not apply where there is little danger that people will trespass in said areas.

(Measures concerning Dose.)

Article 28:

(1) Pursuant to the provisions of Article 51-16, paragraph (3) of the Act, a licensee of waste storage activity shall take the following measures with regard to doses, of radiation workers:

(i) ensuring that the doses of radiation workers will not exceed limit specified by the NRA;

(ii) ensuring that airborne radioactive material that workers inhale will not exceed limits specified by the Nuclear Regulation Authority.

(2) Irrespective of the provisions in the preceding paragraph, where it is urgent and unavoidable, such as a disaster or the possibility of one at a waste storage facilities, radiation workers may engage in emergency operations, but only within a range of doses not exceeding the limits specified by the NRA (female workers will be limited to those who are infertile or those who have notified the licensee, in writing, that they do not intend to become pregnant).

(Patrol and Checking of Waste Storage Facilities)

Article 29:

(1) Pursuant to the provisions of Article 51-16, paragraph (3) of the Act, a licensee of waste storage activity (excluding those who have obtained approval via Article 51-25, paragraph (2) of the Act) shall employ security personnel to patrol and check waste storage facilities at least once a day..

(2) Pursuant to the provisions of Article 51-16, paragraph (3) of the Act, a licensee of a waste storage activity who has obtained the approval as set forth in Article 51-25, paragraph (2) of the Act shall engage security personnel to patrol the facilities at least once every week.

(Periodic Self-Inspection of Waste Storage Facilities)

Article 30:

(1) Pursuant to the provisions of Article 51-16, paragraph (3) of the Act, a licensee of a waste storage facility shall institute inspection measures set forth in the following items (when the approval set forth in Article 51-25, paragraph (2) of the Act has been obtained, excluding item (i)):

(i) for specified waste storage facilities as prescribed in Article 35, item (ii) of the Order (excluding those prescribed in the following item), conducting an inspection every year to determine whether the performance of said facilities conforms with the technical standards specified by the Ordinance of the NRA as prescribed in Article 51-9-2 of the Act;

(ii) with regard to alarm and other emergency devices, conducting performance tests for the operation of each part of said devices every month and an integrated test for the operation of said devices as a whole every year;

(iii) with regard to instruments and radiation detectors that directly relate to operational safety of the waste storage facilities, conducting a calibration every year.

(2) A licensee of waste storage activity who has obtained the approval as set forth in Article 51-25, paragraph (2) of the Act shall conduct an inspection every year to determine whether the facility's performance meets the targets stated in the application form for said approval or the approval for a change as set forth in Article 12-6, paragraph (3) of the Act as applied mutatis mutandis pursuant to Article 51-25, paragraph (3) of the Act, or documents attached to such application form.

(Operation of Waste Storage Equipment)

Article 31: Pursuant to the provisions of Article 51-16, paragraph (3) of the Act, a licensee of waste storage activity shall take the following measures for the operation of the waste storage equipment; this will not apply where the approval set forth in Article 51-25, paragraph (2) of the Act has been obtained:

(i) specifying issues to be confirmed prior to the start of operations, those necessary for operational procedures, matters to be confirmed after shutdown, and ensuring that operators observe them;

(ii) specifying actions to be taken in an emergency and having the operators undertake them;

(iii) maintaining the status of the ventilators, radiation detectors and emergency equipment to ensure their continuous functioningso;

(iv) before operators begin a trial operation, checking the purpose and methods, to be taken when an abnormality occurs;

(v) when operating the waste storage equipment for operational training, specifying the matters to be observed by trainees under the supervision of operators;

(Transport within the Place of Business)

Article 32

(1) Pursuant to the provisions of Article 51-16, paragraph (3) of the Act, a licensee of waste storage activity shall take the measures set forth in the following items with regard to the transport of nuclear

fuel material within the facilities place of business:

(i) encasing nuclear fuel material in a container during transportation though this will not apply in the following cases:

(a) when transporting material contaminated by nuclear fuel material (limited to materials with a radioactivity concentration not exceeding limits specified by the Nuclear Regulation Authority), for which measures to prevent a scatter or leak of radioactive material or other hazard prevention measures specified by the NRA have already been taken;

(b) when transporting material such as large machinery contaminated by nuclear fuel material but which is extremely difficult to encase in a container, while taking hazard prevention measures as approved by the NRA;

(ii) said containers shall conform with the following standards:

(a) the length of each side of the cuboid circumscribed to said container will be no shorter than 10 cm;

(b) the container can be handled easily and safely and is resistant to cracks or damage,because of temperature change, internal pressure, and oscillation;

(iii) ensuring that the dose equivalent rates at the surface and at a distance of one meter from the surface of the container does not exceed the dose equivalent rates specified by the NRA and that the surface density of the radioactive material does not exceed 10% of the surface density limit set forth in Article 27, item (i), (c); (when transport is conducted without encapsulating the material contaminated by nuclear fuel material prescribed in item (i), (a) or (b) in a container, pursuant to the provisions of the proviso to said item, said material contaminated by nuclear fuel material; hereinafter referred to as "material to be transported" in this Article), the vehicle loading or containing said material to be transported, or other machinery or components for transport the nuclear fuel material, etc. (hereinafter referred to as " transporting equipment" in this Article)

(iv) loading said contaminated material in such a way as to prevent any movement or fall during transportation;

(v) ensuring that nuclear fuel material is not loaded onto the same transportation as hazardous materials as specified by the Nuclear Regulation Authority;

(vi) deploying guards at key locations, displaying signs and taking other measures to limit access along the route both to other vehicles and people not directly involved in the movement;

(vii) reducing the speed of the transporting vehicle and, over a long distance, providing a second vehicle for security escort;

(viii)providing an expert in the handling of nuclear fuel material to accompany and supervise the movement as necessary and ensure security;

(ix) labels specified by the Nuclear Regulation Authority to be placed at appropriate positions on the ransportation vehicle and materials in a container designed not to require reshipment, is strong enough for repeated use and is equipped for mechanical loading and unloading and for anchoring to the transport.

(2) When it is difficult to implement all or only part of the measures set forth in item (ii) and item (iii) of said paragraph, other measures approved by the Nuclear Regulation Authority can be implemented. This will not apply when the dose equivalent rate at the surface of the contaminated exceeds the dose equivalent rate specified by the Nuclear Regulation Authority.

(3) The provisions of paragraph (1), item (i) to item (iii) and item (vi) to item (ix) do not apply to transportation within the radiation controlled areas.

(4) In the case where a licensee has taken measures necessary for ensuring transportation security according to the technical standards for transport prescribed in Article 3 to Article 17 of the Ministerial Ordinance on Transport of Nuclear Fuel Material. Outside the Factory or Place of Business (Ministerial Ordinance Issued by the Prime Minister's Office No. 57 of 1978) and Article 3 to Article 19 of the Ministerial Ordinance on Transport of Nuclear Fuel Material,. by Vehicle (Ordinance of the Ministry of Transport No. 72 of 1978), the licensee may conduct the shipment of said nuclear fuel material, etc. within the place of business where the waste storage facilities have been installed, notwithstanding the provisions of paragraph (1).

(Disposal within the Place of Business)

Article 33 Pursuant to the provisions of Article 51-16, paragraph (3) of the Act, a licensee of waste storage activity shall take the measures set forth in the following items with regard to the disposal of radioactive waste at the place of business:

(i) having the disposal of the radioactive waste conducted under the supervision of disposal and protection experts dressed in appropriate work clothes;

(ii) where any person other than those engaged in the disposal of the radioactive waste enters the disposal facilities, having said person follow the instructions of those engaged in the disposal;

(iii) disposing of gaseous radioactive waste with either of the following methods:

(a) discharging waste through the exhaust facilities;

(b) storing waste for disposal in tanks that can prevent radiation hazards;

(iv) when adopting the disposal method in (a) of the preceding item, reducing the concentration of radioactive material in the exhaust to the extent possible through filtration, radioactivity decay over time, dilution with a large amount of air at the exhaust facilities; in this case monitoring the concentration of radioactive material lat the exhaust vent or exhaust monitoring equipment to ensure that radioactive concentrations in the air outside the peripheral monitoring area will not exceed the limits specified by the NRA;

(v) disposing of radioactive liquid waste by any of the following methods:

(a) discharging waste through the drainage facilities;

(b) storing waste for disposal in the drain tanks to prevent radiation hazards;

(c) encapsulating waste in a container or solidifying such waste in a vessel and storing it at a storage disposal facility to prevent radiation hazards;

(d) incinerating waste to prevent radiation hazards;

(e) solidifying waste;

(vi) when adopting the disposal method in (a) of the preceding item, reducing radioactive concentrations in the effluent to the extent possible through filtration, evaporation, adsorption using the ion-exchange resin method, radioactivity decay over time, dilution with a large amount of water at the drainage facilities. In this case, monitoring the concentration of radioactive material in the effluent at the discharge port or effluent monitoring equipment, ensuring that the concentration of radioactive material in the water at the boundary outside the peripheral monitoring area will not exceed the concentration limit specified by the Nuclear Regulation Authority;

(vii) when adopting the disposal method in (c) of item (v) and encasing the radioactive waste in a container, said container shall conform with the following standards:

(a) the container will be resistant to corrosion, non permeable and built to prevent radioactive waste leaks;

(b) said container is free from any cracks or damage;

(c) the container lid is hard to remove;

(viii)when adopting the disposal method in (c) of item (v) and solidifying radioactive waste with a vessel, said vessel can prevent a scatter or leak of radioactive waste;

(ix) when adopting the disposal method in (c) of item (v) and storing radioactive waste at the storage disposal facilities capable of preventing radiation hazards, the following procedures will be followed:

(a) when encapsulating the waste in a container and storing it for disposal, taking measures to prevent contamination threat in the event of any cracks or damage to said vessel, such as covering it with materials that can absorb radioactive waste, or installing a tray that can receive the waste;

(b) attaching a radioactive waste sign to said and indicating a serial number for cross checking the waste with the details based on the provisions of Article 26;

(c) posting precautions for management in a prominent place at said storage disposal facilities;

(x) disposing of solid radioactive waste with any of the following methods:

(a) incinerating waste in equipment that can prevent radiation hazards;

(b) encapsulating waste in a container or solidifying it with a container and storing said waste at a storage disposal facility able to prevent radiation hazards;

(c) Regarding such radioactive waste as large machinery which is extremely difficult to dispose of using the method set forth in (b) above, or radioactive waste that requires radioactivity decay, storing such waste at a storage facility that can prevent radiation hazards;

(xi) when adopting the disposal method set forth in (b) or (c) of the preceding item, and when decay heat of said waste may possibly cause significant overheating, taking necessary cooling measures;

(xii) The provisions of item (vii), item (viii) and item (ix) (excluding (a) of said item) shall apply mutatis mutandis with regard to disposal by the method set forth in (b) of item (x);

(xiii) The provisions of (c) of item (ix) shall apply mutatis mutandis with regard to disposal by the method set forth in (c) of item (x).

(Periodic Evaluation of Waste Storage Facilities)

Article 33-2:

(1) Pursuant to the provisions of Article 51-16, paragraph (3) of the Act, a licensee of a waste storage activity shall take the following measures for each facility at intervals not exceeding ten years:

(i) evaluating the implementation of operational safety activities at the waste storage facility;

(ii) evaluating how the latest technical knowledge is reflected in operational safety activities.

(2) A licensee shall take the following measures no later than the day on which 20 years have elapsed from the commencement of operations:

(i) conducting a technical evaluation examining time-related changes;

(ii) drawing up a ten-year plan for updated operational safety measures to be taken based on the technical evaluation set forth in the preceding item.

(3) The evaluation and plan set forth in the preceding paragraph shall be reevaluated at intervals of not more than ten years.

(4) The provisions of the preceding three paragraphs do not apply where the approval set forth in Article 51-25, paragraph (2) of the Act has been obtained.

(Operational Safety Programs)

Article 34

(1) A person (limited to a licensee of waste storage activity) who intends to seek approval for Operational Safety Programs under Article 51-18, paragraph (1) of the Act shall specify the Operational Safety Programs concerning the matters set forth in the following items for each place of business for which he/she intends to obtain the approval, and shall submit an application form containing said Operational Safety Programs to the NRA. Matters include:

(i) a system for complying with relevant laws and regulations, as well as the Operational Safety Programs (including senior management involvement);

(ii) a system for developing a safety culture (including senior management involvement);

(iii) quality assurance of waste storage facilities (including matters concerning the method and system for conducting root cause analysis and positioning of procedure manuals, in the Operational Safety Programs);

(iv) the duties of those engaged in the operation and management of the waste storage facilities and their organization (excluding the following item);

(v) the duties and authority of chief engineers of radioactive waste in supervising operational safety, and their positions in the organization;

(vi) education and training for radiation workers on operational safety:

(a) policies to provide education on operational safety (including drawing up an implementation

plan);

(b) the following matters concerning education policies on operational safety:

1. compliance with the relevant laws and regulations, as well as the Operational Safety Programs;
2. the structure, functions, and operation of waste storage facilities;
3. radiation control;
4. handling of nuclear fuel and other materials contaminated by nuclear fuel material;
5. actions to be taken in an emergency;

(c) other matters necessary for education policies on operational safety at waste storage facilities;

(vii) the operation of sensitive operational safety equipment;

(viii) specifications of radiation controlled and peripheral monitoring areas, as well as the access control to these areas;

(ix) exhaust monitoring and effluent monitoring equipment;

(x) monitoring of doses, dose equivalents, concentration of radioactive material, and density of radioactive material on the surface of materials contaminated by radioactive material, as well as decontamination;

(xi) the management of radiation detectors and measurement methods;

(xii) policing and checking of the waste storage facilities and accompanying actions;

(xiii) the periodic self-inspection of the waste storage facilities;

(xiv) the reception, transport, disposal and other handling of radioactive waste;

(xv) actions to be taken in an emergency;

(xvi) maintenance of operational safety records and reports for waste storage facilities (including the status of compliance with the Operational Safety Programs). Reports include ones made to senior management covering accidents, failures and other incidents contained in the items of Article 35-16;

(xvii) periodic evaluation of waste storage facilities;

(xviii) sharing with other waste storage facility licensees technical information on operational safety obtained from business operators conducting maintenance checks;

(xix) information disclosure on non-compliance if any;

(xx) other matters necessary for operational safety at waste storage facilities.

(2) Licensees of waste storage facilities seeking approval for a decommissioning plan as set forth in Article 51-25, paragraph (2) of the Act shall add the following matters to the Operational Safety Programs approved under Article 51-18, paragraph (1) of the Act or obtain approval for the amended Operational Safety Programs.no later than the date of said approval. The same applies when intending to further amend said amended Operational Safety Programs. Matters include:

(i) a system for complying with relevant laws and regulations, as well as Operational Safety Programs (including senior management involvement);

(ii) a system for developing a safety culture (including senior management involvement);

(iii) quality assurance of waste storage facilities (including a system for conducting root cause analysis

and positioning of the procedural manuals in the Operational Safety Programs);

(iv) quality assurance of decommissioning measures (including a system for conducting root cause analysis, and positioning of procedure manuals in the Operational Safety Programs);

(v) duties of personnel engaged in decommissioning measures and their organization (excluding the following);

(vi) the duties and authority of chief engineers of radioactive waste in supervising operational safety, and their positions in the organization;

(vii) education on operational safety for radiation workers engaged in the decommissioning measures:

(a) policies to provide operational safety education (including drawing up an implementation plan)

(b) the details of education on operational safety:

1. compliance with relevant laws and regulations, as well as Operational Safety Programs;
2. the structure and functions of the waste storage facilities;
3. the decommissioning measures for the waste storage facilities;
4. radiation control;
5 the handling of nuclear fuel material and material contaminated by nuclear fuel material;
6. actions to be taken in an emergency;

(c) other matters necessary for operational safety education for waste storage facilities;

(viii) the operation of sensitive operational safety equipment;

(ix) the specification of radiation controlled areas, protection areas and peripheral monitoring areas, as well as the access controlto these areas;

(x) the exhaust monitoring equipment and effluent monitoring equipment;

(xi) monitoring of doses, dose equivalents, concentration of radioactive material, and density of radioactive material on the surface of material contaminated by radioactive material, as well as the decontamination;

(xii) tmatters concerning the management of radiation detectors and measurement methods;

(xiii) the policing of waste storage facilities and other accompanying actions;

(xiv) the periodic self-inspection of waste storage facilities;

(xv) transport, disposal and other handling of radioactive waste;

(xvi) actions to be taken in an emergency;

(xvii) maintenance of operational safety records and reports for waste storage facilities (including the status of compliance with Operational Safety Programs). Such reports include ones made to senior management covering accidents, failures and other incidents as set forth in the items of Article 35-16;

(xviii) maintainin operational safety records and reports covering decommissioning measures (including the status of compliance with the Operational Safety Programs). Such reports include ones made to senior management covering accidents, failures and other incidents in the items of Article 35-16;

(xix) sharing with licensees of other waste storage facilities operational safety information obtained

from business operators conducting maintenance checks;

(xx) information dissemination on non-compliance if any;

(xxi) the management of decommissioning measures;

(xxii) other matters necessary for operational safety pertaining to waste storage facilities or decommissioning measures.

(3) The provisions of the main clause of paragraph (1) apply mutatis mutandis in the cases set forth in the preceding paragraph.

(4) One original copy of the application form set forth in paragraph (1) (including the cases where said paragraph is applied mutatis mutandis pursuant to the preceding paragraph) is to be submitted.

(Inspection of the Status of Compliance with the Operational Safety Programs)

Article 34-2:

(1) Inspections limited to to radioactive waste storage activity under Article 51-18, paragraph (5) of the Act will be conducted four times annuallyevery year. However, inspections for waste storage facilities for which approval as set forth in Article 51-25, paragraph (2) of the Act has already been obtained will be conducted four times or less every year, in accordance with the progress of the decommissioning measures.

(2) Inspection procuedres set forth in the preceding paragraph which are specified by the Ordinance of the NRA as set forth in Article 12, paragraph (6) of the Act as applied mutatis mutandis pursuant to Article 51-18, paragraph (6) of the Act shall be as follows:

(i) entering the office, facility or place of business;

(ii) inspecting books, documents, equipment, components, or any other necessary property;

(iii) questioning employees and other people concerned;

(iv) requesting nuclear source material, nuclear fuel material, material contaminated by nuclear fuel material, or any other necessary samples limited to the minimum amount necessary for testing.

(Physical Protection Programs)

Article 35-2:

(1) A licensee of a waste storage facility who intends to obtain approval for Physical Protection Programs under Article 51-23, paragraph (1) of the Act shall specify the Physical Protection Programs concerning the matters set forth in the following items for each place of business for which he/she intends to obtain the approval, and shall submit an application form containing said Physical Protection Programs to the Nuclear Regulation Authority. Matters include:

(i) The system for complying with relevant laws and regulations, as well as Physical Protection Programs (including senior management involvement);

(ii) a system for developing a security culture (including senior management involvement);

(iii) the duties of those engaged in the physical protection of specified nuclear fuel material and their organization;

(iv) the specification of the physical protection areas and limited access areas as well as policing and monitoring (for the place of business handling the specified nuclear fuel material set forth in item (i) or item (ii) of the table of Article 33-3, paragraph (1), the physical protection areas and peripheral physical protection areas). Matters include:

(v) access control for the physical protection areas;

(vi) the management of specified nuclear fuel material;

(vii) measures for continuously maintaining equipment or devices necessary for the physical protection of specified nuclear fuel material;

(viii) an information system security plan;

(ix) the maintenance and inspection of equipment and devices for the physical protection of specified nuclear fuel material;

(x) responses in an emergency;

(xi) development of a communications system;

(xii) the management of information on measures for the physical protection of specified nuclear fuel material;

(xiii) the education and training necessary for the physical protection of specified nuclear fuel material;

(xiv) an emergency response plan for waste storage facilities;

(xv) measures to be taken in response to threat such as sabotage, (limited to matters falling under Article 33-3, paragraph (2), item (xxiii including cases where said item is applied mutatis mutandis pursuant to paragraph (3) and paragraph (4) of said Article));

(xvi) periodic evaluation and improvements necessary for the physical protection of specified nuclear fuel material;

(xvii) maintaining records on the physical protection of specified nuclear fuel material at waste storage facilities (including the status of compliance with Physical Protection Programs);

(xviii) other matters necessary for the physical protection of specified nuclear fuel material at waste storage facilities.

(2) One original copy and one duplicate copy of the application form set forth in the preceding paragraph shall be submitted (when filing an application for any of the waste storage facilities set forth in item (iv) of the table of Article 63, paragraph (1) of the Order that is specified by the Nuclear Regulation Authority in a public notice, one original copy and two duplicate copies of the application form).

(Inspection of the Status of Compliance with Physical Protection Programs)

Article 35-2-2:

(1) Inspections, limited to radioactive waste storage activity, under Article 12-2, paragraph (5) of the Act as applied mutatis mutandis pursuant to Article 51-23, paragraph (2) of the Act is to be conducted once every year.

(2) The matters concerning the inspection set forth in the preceding paragraph which are specified by the Ordinance of the NRA as set forth in Article 12-2, paragraph (6) of the Act as applied mutatis

mutandis pursuant to Article 51-23, paragraph (2) of the Act shall be as follows:

(i) entering the office, facility or place of business;

(ii) inspecting books, documents, equipment, components, or any other necessary property;

(iii) questioning employees and other people concerned;

(iv) requesting the submission of specified nuclear fuel material or any other necessary samples limited to the minimum amount necessary for testing.

(Application for Approval for Decommissioning Plans)

Article 35-6:

(1) A licensee of a waste storage activity who seeks approval for a decommissioning plan (hereinafter referred to as a "decommissioning plan"), pursuant to the provisions of Article 51-25, paragraph (2) of the Act, shall draw up said plan covering the matters set forth in the following items and submit an application form containing said plan to the Nuclear Regulation Authority:

(i) the name and address of the applicant and, in the case of a corporation, the name of its representative;

(ii) the name and location of the place of business pertaining to the decommissioning measures;

(iii) the waste storage facilities subject to decommissioning measures pertaining to the decommissioning plan for which approval set forth in Article 51-25, paragraph (2) of the Act is sought (hereinafter referred to as the “facilities under decommissioning measures”);

(iv) facilities to be dismantled and methods of dismantlement, out of the facilities set forth in the preceding item;

(v) removal of contamination caused by nuclear fuel material;

(vi) disposal of nuclear fuel material;

(vii) decommissioning measures.

(2) The documents or drawings set forth in the following items shall be attached to the application form:

(i) to (x) (omitted)

(3) One original copy and one duplicate copy of the application form set forth in paragraph (1) shall be submitted.

(Standards for Approval for Decommissioning Plans)

Article 35-9: The standards, limited to those pertaining to radioactive waste storage activity, specified by the Ordinance of the NRA as prescribed in Article 12-6, paragraph (4) of the Act as applied mutatis mutandis pursuant to Article 51-25, paragraph (3) of the Act shall be as follows:

(i) solid nuclear fuel material that had been managed or liquid or solid nuclear fuel material, that had been processed have been transported out of the waste storage facilities;

(ii) the management, processing, and disposal of nuclear fuel material has been conducted in an appropriate manner;

(iii) the implementation of decommissioning measures isafeguards against disasters that may be

caused by nuclear fuel material.

(Application for Confirmation of the Completion of Decommissioning Measures)

Article 35-10:

(1) A licensee of waste storage activity who seeks confirmation of the completion of decommissioning measures, pursuant to the provisions of Article 12-6, paragraph (8) of the Act as applied mutatis mutandis pursuant to Article 51-25, paragraph (3) of the Act, shall submit an application to the NRA containing the matters set forth in the following items:

(i) to (v) (omitted)

(2) A document containing the following matters shall be attached to the application set forth in the preceding paragraph:

(i) the distribution of contamination caused by nuclear fuel material;

(ii) other matters in addition to the preceding paragraph that the Nuclear Regulation Authority finds necessary.

(3) One original copy and one duplicate copy of the application form set forth in paragraph (1) shall be submitted.

(Standards for Confirmation of the Completion of Decommissioning Measures)

Article 35-11: The standards, limited to those pertaining to radioactive waste storage activities, specified by the Ordinance of the NRA as prescribed in Article 12-6, paragraph (8) of the Act as applied mutatis mutandis pursuant to Article 51-25, paragraph (3) of the Act shall be as follows:

(i) there is no need to take radiation prevention measures with regard to remaining facilities and soil on the premises under decommissioning measures;

(ii) the disposal of the nuclear fuel material has been completed;

(iii) the handover of radiation control records prescribed in Article 26, paragraph (1) to an organization designated by the Nuclear Regulation Authority set forth in paragraph (5) of said Article has been completed.

(Report of Accidents and Failures)

Article 35-16: When falling under any of the following items, a waste storage activity licensee, including former licensees, (hereinafter the same applies in the following Article and Article 40) shall immediately inform the Nuclear Regulation Authority within 10 days, and make a report on the situation and actions to be taken pursuant to the provisions of Article 62-3 of the Act:

(i) when any nuclear fuel material has been stolen or has gone missing;

(ii) in the event of a failure of the waste storage facilities and when special measures are required for repair work for said failure, and this has interrupted the processing or management of radioactive waste;

(iii) when a failure of the waste storage facilities has interrupted or might interrupt the processing or management of radioactive waste by losing the ability to confine nuclear fuel materials in a limited area, to prevent radiation hazards from external sources or prevent a fire or explosion at the facility;

(iv) when a failure or other unexpected event has caused an abnormality in discharging gaseous radioactive waste through the exhaust facilities or discharging radioactive liquid waste through the drainage facilities;

(v) where gaseous radioactive waste has been discharged through the exhaust facilities, and when the concentration of radioactive material in the air outside the peripheral monitoring area has exceeded the concentration limit set forth in Article 33, item (iv);

(vi) where radioactive liquid waste has been discharged through the drainage facilities, and when the concentration of radioactive material in the water at the boundary outside the peripheral monitoring area has exceeded the concentration limit set forth in Article 33, item (vi);

(vii) when any nuclear fuel material has leaked outside the radiation controlled area;

(viii) when a failure or other unexpected event in the waste storage facilities has caused a leak of nuclear fuel material within the radiation controlled area. However, cases falling under any of the following are excluded--with the exception where new measures have been taken to limit access or secure the location where the leak occurred or the case where the leaked material has spread to outside the radiation controlled area:

(a) when leaked liquid nuclear fuel material, has not spread outside the weir to prevent the spread of any leak that had been installed around the equipment where the leak occurred;

(b) where gaseous nuclear fuel material has leaked, but when the ventilators at the leak location continue functioning properly;

(c) when the amount of leaked nuclear radiation material, is small or when the leak is otherwise minor;

(ix) when the nuclear fuel material has reached or may possibly reach criticality;

(x) when a failure or other unexpected event in the waste storage facilities has caused persons in the radiation controlled area to be exposed, and when effective doses due to said exposure have exceeded or may possibly exceed 5mSv with regard to radiation workers or 0.5mSv with regard to non-radiation personnel;

(xi) when any radiation worker has been exposed to radiation that exceeds or may possibly exceed the dose limit set forth in Article 28, paragraph (1), item (i);

(xii) in addition to what are set forth in the preceding items, when any hazard (excluding those that do not require hospital treatment) has occurred or may possibly occur to people in relation to the waste storage facilities.

(Emergency Measures)

Article 36 Pursuant to the provisions of Article 64, paragraph (1) of the Act, a licensee of a waste storage

facility shall take the following emergency measures:

(i) where a fire has occurred or there is a risk of a fire spreading, extinguishing said fire or preventing its spread and at the same time reporting the situation to fire authorities;

(ii) moving nuclear fuel material whenever possible to a safer place and prohibiting access with ropes and signs and the employment of guards to unauthorized personnel;

(iii) warning people within or near a waste storage facility to evacuate when appropriate;

(iv) preventing the spread of contaminated nuclear fuel material and removing said contamination:

(v) taking emergency precautions including possible evacuation where persons have been or may be exposed to radiation hazards;

(vi) taking other measures necessary to prevent radiation hazards.

Table H3-1 Ordinance on Standards for the Location, Structure, and Equipment of Waste Interim Storage/treatment Facilities (Excerpt)

(Shielding)

Article 2:

(1) Waste storage facilities shall be designed to include such measures as shielding to significantly reduce doses around the place of business due to direct and sky-shine radiation from said waste storage facilities.

(2) The design should include shielding measures to reduce doses in the radiation controlled area or other places within the place of business where personnel are present.

(Function for Confining Radioactive Waste)

Article 3: Waste storage facilities shall be able to confine radioactive waste in a limited area.

(Prevention of Fire Damage)

Article 4: Waste storage facilities shall be designed to include the following safety measures to prevent or limit damage due to fire or explosion:

(i) preventing the occurrence of a fire and explosion;

(ii) detecting a fire and explosion at an early stage and extinguishing the fallout;

(iii) reducing the impact of a fire and explosion.

(Ground for Constructing Waste Storage Facilities)

Article 5:

(1) Waste storage facilities shall be constructed on ground solid enough to support said facilities even in the event of a seismic incident calculated under paragraph (2) of the following Article (with regard to significant facilities for maintaining safety, including the seismic force set forth in paragraph (3) of said Article).

(2) Major facilities with a high degree of built-in safety measures shall be constructed on solid where there

is unlikely to be any major impact on the facilities even in the event of ground where there is negligible possibility of a loss of their safety functions even in the event of earth problems.

(3) Major facilities with a high degree of built-in safety measures shall be constructed on ground where there is negligible possibility of displacement.

(Prevention of Damage due to Earthquakes)

Article 6

(1) Waste storage facilities shall be designed to fully sustain a major seismic force.

(2) The seismic force set forth in the preceding paragraph shall be calculated in accordance with degrees of radiation effects to the public resulting from a loss of safety functions of the waste storage facilities that may possibly be caused by an earthquake.

(3) Major facilities shall be designed to maintain their operational safety functions even against the impact of a major seismic force possibly triggered by an earthquake.,

(4) Major facilities shall be designed to protect their safety functions against a potential slope failure caused by earthquake activity.

(Prevention of Tsunami Damage)

Article 7: Waste storage facilities shall be designed to protect their safety while in operation against the effects of even major tsunami activity..

(Prevention of Damage due to Impacts from the Other External Events)

Article 8:

(1) Waste storage facilities shall be designed to maintain their safety measures even in the event of a catastrophic natural event other than earthquakes and tsunamis.

(2) Waste storage facilities shall be designed to maintain their safety measures against human-induced events (excluding intentional events) within the place of business vicinity..

(Prevention of Illegal Entry into Waste Storage Facilities)

Article 9: The place of business shall institute measures to prevent illegal entry into the waste storage facilities or the introduction of explosives, flammable or other items which may harm personnel or the facilities themselves. Other measures will prevent unauthorized computer access (as prescribed in Article 2, paragraph (4) of the Act on the Prohibition of Unauthorized Computer Access (Act No. 128 of 1999)).

(Prevention of Criticality of Nuclear Fuel Material)

Article 10: Where there is a risk that nuclear fuel material may possibly reach criticality, waste storage facilities shall take measures to prevent such an occurrence.

(Facilities with Safety Functions)

Article 11:

(1) Facilities with safety functions shall secure such functions.

(2) When sharing safety functions with other nuclear facilities or sharing the equipment of facilities with safety functions measures will be taken to ensure that said safety functions at all facilities are not damanged.

(3) An inspection can be conducted at facilities with safety functions to ensure the safety of their operations and the maintenance and repair of such functions.

(4) Major safety facilities shall have automatic redundancy if it is necessary to maintain their function and ensure the safety of waste storage facilities.

(Prevention of Radiation Hazards in the Event of a Postulated Accident that May Cause the Highest Dose)

Article 12: Waste storage facilities shall be designed to prevent public radiation hazards around the place of business in the event of a postulated accident that may cause the highest dose.

(Waste Treatment Facilities)

Article 13: Waste storage facilities shall have facilities to perform the functions prescribed in Article 32, item (ii) of the Order for Enforcement of the Act on the Regulation of Nuclear Source Material, Nuclear Fuel Material and Reactors (Cabinet Order No. 324 of 1957), prescribed as follows:

(i) a facility can treat the radioactive waste it accepts;

(ii) when discharging radioactive waste generated by such treatment, installing an exhaust vent connected to disposal facilities or taking other necessary measures so that the concentration of airborne radioactive material outside the peripheral monitoring area or material in the water at the boundary of the peripheral monitoring area can be significantly reduced.

(Management Facilities)

Article 14: Waste storage facilities shall manage radioactive waste as follows:

(i) the facilities shall have the capacity to manage radioactive waste;

(ii) facilities will use an appropriate method to store radioactive waste, taking into consideration the properties of said waste.

(iii) for facilities that could overheat by decay heat and radiations from radioactive waste, necessary cooling measures will be put in place.

(Instrumentation and Control Facilities)

Article 15:

(1) Waste storage facilities shall have instrumentation and control facilities to properly monitor and confirm the restriction of radioactive waste to a limited area and other similar functions.

(2) Waste storage facilities shall be equipped to detect situations—and raise the alarm--where an accident may threaten the safety of a facilitywhere the concentration of radioactive material or radiation doses as set forth in item (ii) of the following Article have risen significantly, or where there is a risk that a significant amount of radioactive waste leaks from the disposal facilities.

(Radiation Control Facilities)

Article 16: The place of business shall have radiation control facilities, as prescribed as follows:

(i) equipment for monitoring and managing doses in order to protect radiation workers;

(ii) equipment to monitor and measure radioactive material concentrations and radiation doses within the place of business and surrounding area;

(iii) equipment to indicate necessary information at an appropriate place to protect the public and radiation workers from radiation.

(Disposal Facilities)

Article 17:

(1) Waste storage facilities shall have disposal facilities able to treat locally generated radioactive waste and significantly reduce the concentration of radioactive material in the air outside the peripheral monitoring area and in water at the border of the peripheral monitoring area.

(2) Waste storage facilities shall have the capacity to store radioactive waste for disposal.

(Standby Power)

Article 18: Waste storage facilities shall secure standby power to ensure the continued operation of monitoring and other necessary equipment in the event of loss of electric power supply from an off-site power grid.

(Communications Equipment)

Article 19:

(1) The place of business shall have a warning device and communications equipment to issue instructions to local personnel in the event of an accident..

(2) The place of business shall have equipment to communicate with exterior locations in the event of an accident.

(3) Waste storage facilities shall have the ability to evacuate personnel from within the place of business.

Table H3-2 Ordinance on Standards for the Location, Structure, and Equipment of Category 2 Waste Disposal Facilities (Excerpt)

(Ground for Constructing Waste Disposal Facilities)

Article 3:

(1) Waste disposal facilities shall be constructed on terrain firm enough to support said facilities even in

the event of a seismic force calculated under paragraph (2) of the following Article.

(2) A waste disposal site shall be constructed on terrain where there is negligible threat to its safety even in the event of ground movement.

(3) A waste disposal site shall be constructed on ground where there is negligible possibility of displacement.

(Prevention of Earthquake Damage)

Article 4:

(1) Waste disposal facilities shall be designed to fully sustain a seismic force.

(2) A seismic force as set forth in the preceding paragraph shall be calculated in accordance with degrees of radiation effects on the public should the safety functions of a facility be lost because of the effects of an earthquake.

(Prevention of Tsunami Damage)

Article 5: Waste disposal facilities shall be designed to protect their safety functions despite a large-scale impact by a tsunami.

(Prevention of Damage due to Impacts from the Other External Events)

Article 6:

(1) Waste disposal facilities shall be designed to retain their safety features even following a natural phenomena excluding earthquakes and tsunamis.

(2) Waste disposal facilities shall be designed to retain their safety features against postulated human-induced events (excluding intentional events) within the place of business or the neighboring area.

(Prevention of Fire Damage)

Article 7: Waste disposal facilities shall be designed with a combination of measures to protect its safety in the event of fire and explosion:

(i) preventing a fire and explosion;

(ii) early detection of a fire and explosion and extinguishing said fire.

(iii) reducing the impact of a fire and explosion

(Shielding)

Article 8:

(1) Waste disposal facilities shall incorporate measures such as shielding to significantly reduce doses around the place of business from direct and sky-shine radiation.

(2) Where there is a need to prevent radiation hazards, waste disposal facilities shall incorporate measures such as shielding to reduce doses in the radiation controlled area or other populated places

within the place of business.

(3) Waste disposal facilities shall incorporate measures to prevent the scattering of radioactive material.

(Prevention of Radiation Hazards at Abnormal Times)

Article 9: Waste disposal facilities shall satisfy the following requirements:

(i) the facilities do not cause radiation hazards to the public in the vicinity of the place of business even when an abnormality occurs in the waste disposal facilities during the entirety of the facility's operational life;

(ii) during the above mentioned period, the facilities are expected to shift to a situation where there is no need to take any measures for the maintenance of the waste disposal site.

(Waste Disposal Site)

Article 10:

(1) A waste disposal site shall be able to prevent any abnormal leak of radioactive material outside the waste disposal site.

(2) During a pit disposal, a waste site will be able to confine radioactive material in a limited area at least during the period up to the completion of the operation by installing an engineered barrier structure or by another method.

(3) The safety of a waste disposal site will not be damaged by any chemical material contained in the disposed radioactive waste or any other chemical material.

(Radiation Control Facilities)

Article 11: The place of business shall have the following radiation control facilities:

(i) equipment for monitoring and managing doses in order to protect radiation workers from radiation;

(ii) equipment for monitoring and measuring the concentration of radioactive material and radiation doses within the place of business and the nearby area;

(iii) equipment to relay necessary information at an appropriate place to inform and protect the public and workers from radiation.

(Disposal Facilities)

Article 12:

(1) Waste disposal facilities shall have the capability to treat radioactive waste generated in said facilities and thereby significantly reduce radioactive material concentrations in the air outside the peripheral monitoring area and in water at the border of the peripheral monitoring area.

(2) Waste disposal facilities shall have sufficient capacity to store radioactive waste for disposal.

(Monitoring Equipment for Groundwater Levels)

Article 13: Waste disposal facilities shall have equipment (excluding equipment prescribed in Article 11, item (i) and item (ii)) for monitoring and measuring groundwater levels and other situations on the waste disposal site and in the nearby vicinity.

(Standby Power)

Article 14: Waste disposal facilities shall secure standby power for monitoring and other necessary equipment in the event of loss of electric power supply from an off-site power grid.

(Communications Equipment)

Article 15:

(1) The place of business shall have a warning device and communications equipment to provide instructions to personnel when any abnormality occurs in the waste disposal facilities.

(2) The place of business shall have equipment to communicate with external locations when any abnormality occurs in the waste disposal facilities.

(3) Waste disposal facilities shall have facilities for the evacuation of people within the place of business.

Table H4-1 Ordinance on Technical Standards for the Design and Construction Methods for Specified Waste Disposal Facilities or Specified Waste Interim Storage/Treatment Facilities (Excerpt)

(Prevention of Fire Damage)

Article 3:

(1) If there is a significant risk from fire or explosion to the safety of specified waste disposal facilities or waste storage facility fire extinguishing and alarm equipment (limited to equipment that automatically detects a fire and set off an alarm, such as automatic fire-alarm box and electric fire alarm system) shall be installed as necessary.

(2) The fire extinguishing and alarm equipment described in the preceding paragraph shall be such that their failure, damage or malfunction is unlikely to significantly impair the safety of the specified waste disposal fand storage facilities.

(3) With regard to facilities with safety functions that may be damaged by a fire or explosion, noncombustible or nonflammable materials shall be used to the extent possible, while preparing proper protection measures such as the installation of fire walls, as necessary.

(4) Equipment for handling or managing radioactive waste that may generate hydrogen shall be structured to prevent the retention of generated hydrogen.

(5) Cells and rooms containing equipment for handling or managing radioactive waste that may generate hydrogen (excluding equipment free from any risk of explosion) shall be built to prevent the retention of hydrogen even in the case where hydrogen leaks from said equipment and other appropriate measures for preventing an explosion shall be taken therefor.

(Ground for Constructing Specified Waste Disposal Facilities or Specified Waste Storage Facilities)

Article 4: Specified waste disposal or waste storage facilities shall be constructed terrain that can support such structures even if they are subject to seismic forces described in paragraph (1) of the following Article has acted.

(Prevention of Earthquake Damage)

Article 4-2: Specified waste disposal or waste storage facilities shall be designed to prevent radiation hazards to the public even if damaged by a seismic force. Such force is calculated by the radiation impact on the public resulting from a loss of a facility's safety functions possibly caused by an earthquake

(2) Major safety facilities shall be designed to protect operating safety functions despite any major impact from a seismic fore caused by an earthquake.

(3) Protective measures will be taken to ensure that the safety functions of key facilities will not be threatened because of slope failure resulting from an earthquake.

(Prevention of Tsunami Damage)

Article 4-3: In order to ensure that the safety of specified operating waste disposal and waste storage facilities will not be impaired by a major tsunami protective and other key measures shall be taken.

(Prevention of Damage due to Impacts from the Other External Forces)

Article 4-4:

(1) In the case where there is a risk that postulated natural phenomena other than earthquakes or tsunamis may threaten the safety of specified waste disposal or waste storage facilities, protection measures, measures to strengthen ground foundations and other measures shall be taken.

(2) If there are places of business, railways, roads, or human concentrations adjacent to waste disposal or waste storage facilities, protection and other relevant measures will be taken to ensure said facilities will not suffer from 'spillover' effects from those adjacent areas because of fires, eplosions, accidents involving vehicles, ships or aircraft carrying hazardous materials or other human-induced events.

(Prevention of Illegal Entry into Specified Waste Disposal and Waste Storage Facilities)

Article 4-5: The place of business where specified waste disposal or waste storagefacilities or are installed (shall prepare security measures to prevent illegal entry or the introduction of explosive, flammable or other items that may harm personnel and the failities themselves. Other measures will prevent unauthorized computer access as prescribed in Article 2, paragraph (4) of the Act on the Prohibition of Unauthorized Computer Access (Act No. 128 of 1999))

(Prevention of Criticality of Nuclear Fuel Material)

Article 4-6: Where there is a risk that nuclear fuel material may reach criticality, specified waste disposal facilities and waste storage facilities shall take the necessary preventive measures.

(Materials and Structures)

Article 5:

(1) Materials and structures of vessels and pipes at specified waste disposal and waste storage and supporting structures, which are necessary for ensuring the safety of the facilities, should be of sufficient strength and corrosion resistance to meet the stated design standards of such vessels.

(2) Vessels and pipes of specified waste disposal and waste storage facilities which are necessary to ensure the safety of the facilities should be able to withstand any appropriate pressure test or leakage test without significant leakage.

(Function for Confining Radioactive Waste)

Article 6: Specified waste disposal or waste storage facilities shall be designed to maintain the function for confining radioactive waste in a limited area as prescribed as follows:

(i) when connecting a pipe delivering non-radioactive fluid waste to a vessel or pipe containing fluid radioactive waste, the system shall be such that there is no risk that the radioactive waste will 'flow back' into the pipes delivering non-contaminated waste.

(ii) the hood handling non-sealed radioactive waste shall be such that it can properly maintain theair flow speed at the opening;

(iii) a room where contamination by radioactive waste may occur shall be such that it can maintain a negative inner pressure, if necessary;

(iv) facilities where equipment handling radioactive liquid waste is installed (limited to the part of a facility where there is a risk that a leak of radioactive liquid waste may expand) are to be constructed as follows:

(a) the composition of the floor and wall surfaces inside a structure hinders the leakage of radioactive liquid waste;

(b) an embankment to prevent a leak of radioactive liquid waste outside the facilities is installed in the vicinity of equipment handling the waste, at the entrance to the facility and the surrounding area; This will not apply where the floor surface inside the facility is lower than the floor surface of neighboring buildings or the ground surface and there is negligible possibility of a leak outside the facilities;

(c) the facilities are constructed so that inside floor surfaces are not above drainage canals discharging effluent outside the place of business (excluding drainage canals for spring water which have no openings within radiation controlled area and are not subject to radioactive waste contamination). This does not apply where said drainage canals have a system that safely disposes of the effluent contaminated by radioactive waste and equipment for measuring the matters set forth in Article 15, paragraph (1), item (iii).

(Shielding)

Article 7:

(1) Specified waste disposal and waste storage facilities shall be designed to maintain doses around the place of business due to direct and sky-shine radiation from said facilities far below the dose limits specified by the Nuclear Regulation Authority.

(2) Shielding equipment with the capability to prevent radiation hazards shall be installed in sensitive araeas the place of business. In this case, measures to prevent a radiation leak shall be taken where shielding equipment has openings, pipes, or other potentially vulnerablepenetration points.

(Ventilation)

Article 8: At places where there is a need to prevent radiation hazards due to air contaminated by radioactive waste within the specified waste disposal or waste storage facilities, ventilators shall be installed as follows:

(i) ventilators with the capacity to prevent radiation hazards;

(ii) ventilators are designed to prevent air contaminated by radioactive waste from flowing back;

(iii) newly installed filters can be properly maintained, easily replaced and has a structure to the easy removal of contamination by radioactive waste;

(iv) the air inlet is installed in such a way it will not easily take in air contaminated by radioactive waste.

(Prevention of Contamination by Radioactive Waste)

Article 9: Within buildings in specified waste disposal or waste storage facilities frequented by many people,,radioactive waste contamination can be easily removed from the surface of walls, floors and other areas with which people may come into contact with.

(Facilities for Accepting or Managing Radioactive Waste)

Article 10:

(1) Specified waste disposal facilities for accepting waste that could be overheated by decay heat and radiations from radioactive waste shall be constructed so that necessary cooling measures can be taken.

(2) Specified waste storage facilities shall be constructed as prescribed as follows:

(i) have the required capacity to manage radioactive waste;

(ii) facilities use an appropriate method for storing radioactive waste based on its particular properties;

(iii) for facilities that could by affected by decay heat and radiations from radioactive waste, necessary measures are to be put in place for cooling.

(Waste Treatment and Disposal Facilities)

Article 11: Equipment for disposing of radioactive waste shall be installed as prescribed as follows:

(i) said equipment can dispose of radioactive waste generated in the specified waste disposal or waste

storage facilities so that the concentration of radioactive material in the air outside the peripheral monitoring area and in water at the border of the peripheral monitoring area will be reduced below their respective concentration limits specified by the Nuclear Regulation Authority;

(ii) the equipment is installed separately from equipment for disposing of waste other than radioactive waste; this does not apply where non radioactive fluid waste is fed into equipment handling fluid radioactive waste, but where there is little possibility that that radioactive waste will flow back into the system handling non radioactive waste.

(iii) the equipment for disposing gaseous radioactive waste does not discharge this waste at points other than the exhaust vent;

(iv) filters for equipment for disposing of gaseous radioactive waste must be easy to maintain and replace and be so structured as to ensure the easy removal of contamination by radioactive waste;

(v) the equipment for disposing of radioactive liquid waste discharges said waste only at the discharge port.

(2) Equipment for treating radioactive waste shall have the capability of treating all the radioactive waste it accepts.

(Facilities with Safety Functions)

Article 12:

(1) When sharing of equipment or other items between facilities with safety functions, specified waste disposal and waste storage facilities will be designed to prevent any damage to their safety functions.

(2) Facilities with safety functions shall be designed to ensure that an inspection or testing of the safety functions of said facilities and the integrity of their maintenance or repair can be conducted.

(3) In addition to what are prescribed in the preceding paragraph, facilities with safety functions or systems to which said facilities belong shall have automatic redundancy if it is necessary to maintain their safety functions.

(Equipment for Transporting)

Article 13: Equipment to transport radioactive waste (excluding equipment free from any risk of significantly impairing human safety) shall be installed as follows:

(i) said equipment has the capability to move radioactive waste that ordinarily needs to be transported;

(ii) such equipment can safely retain radioactive waste in the event of the suspension of the power supply for transporting said radioactive waste.

(Instrumentation and Control Facilities)

Article 14:

(1) Specified waste disposal or waste storage facilities shall have equipment to detect and raise an immediate alarm to any safety risks endangering said facilities through damage or malfunction of

equipment. Other include where a concentration of radioactive material set forth in paragraph (1), item (ii) of the following Article or the dose equivalent prescribed in item (iv) of said paragraph has risen significantly, or where there arises a risk that a significant amount of radioactive material in a liquid state leaks from the disposal facilities of radioactive liquid waste,.

(2) Specified waste disposal or storage facilities shall have circuits to ensure that radioactive waste can continue to confined in a limited area even in the event of equipment damanage or malfunction. There will also be equipment to promptly and automatically respond to a fire or explosion.

(Radiation Control Facilities)

Article 15:

(1) The place of business shall have radiation control facilities for measuring, both directly and indirectly,

(i) dose equivalent rates specified by the Nuclear Regulation Authority displayed prominently at the side wall of a radiation shielding structure of the body of the waste management equipment and facilities for accepting radioactive waste;

(ii) concentration of radioactive material in exhaust gases at or near the appropriate exhaust vent;

(iii) concentration of effluent radioactive material at or near the discharge port of radioactive liquid waste:

(iv) dose equivalent and concentration of airborne radioactive material, as well as the density of radioactive material on a contaminated surface as specified by the Nuclear Regulation Authority;

(v) dose equivalent specified by the NRA of external radiation in the peripheral monitoring area.

(2) Radiation control facilities shall indicate necessary information at an appropriate place from of the matters set forth in the preceding paragraph.

(Standby Power)

Article 16: Specified waste disposal or waste storage facilities shall secure standby power to be used for monitoring and other necessary equipment in the event of loss of electric power supply from off-site power grid.

(Communications Equipment)

Article 17:

(1) The place of business shall have a warning device and communications equipment so that necessary instructions can be issued to people within the place of business in the event of an accident.

(2) The place of business shall have equipment to communicate with external sources in the event of an accident.

(3) Specified waste disposal or waste storage facilities shall have equipment to help the evacuation of people from within the place of business.

F

Table H6-1 Technical Standards

1. Technical Standards for Waste Disposal Facilities

(Technical Standards under Article 6 of the Ordinance on Activity of Category 2 Waste Disposal of Nuclear Fuel Material or Material Contaminated by Nuclear Fuel Material)

(i) the total amount of radioactivity for each type of radioactive material contained in a radioactive waste landfill shall not exceed the total amount of radioactivity for each type of radioactive material stated in the application form for permission set forth in Article 51-2, paragraph (1) of the Act or Article 51-5, paragraph (1) of the Act and in the document that contains the conditions attached when the permission was granted under Article 62-2, paragraph (1) of the Act (hereinafter referred to as the "application form, etc." in this Article, Article 6-3, and Article 8);

(ii) before starting landfilling, standing water shall be removed and measures taken to prevent the infiltration of fresh rainwater at the waste disposal site. (when the site is demarcated with internal partition equipment as set forth in item (iii) of the following paragraph, the demarcated area for landfilling; hereinafter the same applies in this item

(iii) when landfilling solidified concrete waste and where there is a risk that radioactive material may scatter outside the waste disposal site, measures to prevent scattering shall be taken);

(iv) the waste disposal site shall be filled with earth and sand after completing the landfill so that there will nohole will be left;

(v) explosive, corrosive and other hazardous materials shall not be landfilled at the waste disposal site;

(vi) after landfill completion the surface of the waste disposal site shall be covered with earth and sand so that landfilled material and equipment are not easily exposed;

(vii) the waste disposal facilities shall have the structure and equipment stated in the application form in addition to satisfying the preceding items.

In the case of conducting a pit disposal with an engineered barrier structure installed

In addition details in the preceding paragraph, technical standards for waste disposal facilities are as follows:

(i) the facilities shall be constructed by the method specified by the Nuclear Regulation Authority for the prevention of radiation hazards;

(ii) the engineered barrier structure shall satisfy the following requirements:

(a) structurally it is resistant to its own weight,, earth pressure or seismic force;

(b) measures are taken to prevent corrosion from surface or underground water and the soil;

(iii) a waste disposal site with an opening whose area exceeds 50 square meters or has a capacity exceeding 250 cubic meters shall satisfy the requirements set forth in the preceding item and shall be demarcated by internal partition equipment, which is installed by the method specified by the Nuclear Regulation Authority for the prevention of radiation hazards, into areas whose respective areas do not exceed around 50 square meters or into areas whose respective capacities does not exceed around 250 cubic meters;

(iv) while landfill is ongoing, the barrier structure and internal partition equipment detailed in item (iii) shall be inspected as necessary, and where a risk of damage to such equipment or a leak of radioactive material is found, required measures shall be taken;

(v) at the waste disposal site where landfilling is completed, or where the site is demarcated by internal partition equipment set forth in item (iii), at the demarcated area where landfilling is completed, a cover that satisfies the requirements set forth in item (ii) shall be installed promptly by the method specified by the Nuclear Regulation Authority for the prevention of radiation hazards, before covering the site or the area with earth and sand.

In the case of conducting a pit disposal without installing an engineered barrier structure

In addition to what are provided for paragraph (1), technical standards for waste disposal facilities are to be as follows:

(i) the facilities shall be constructed by the method specified by the Nuclear Regulation Authority for the prevention of radiation hazards;

(ii) the facilities solidifying radioactive waste integrally shall satisfy the requirements set forth in item

(iii) of the preceding paragraph and its volume shall not exceed around 500 cubic meters.

2. Technical Standards for Radioactive Waste to be Disposed of

(Technical Standards under Article 8 of the Ordinance on Activity of Category 2 Waste Disposal of Nuclear Fuel Material or Material Contaminated by Nuclear Fuel Material)

(i) in the case of Intermediate Depth Disposal

(a) radioactive waste to be disposed of shall be generated at the factory or place of business where a fuel facility (limited to a facility solely conducting the fabrication and enrichment of fuel assemblies that contain mixed uranium and plutonium oxide), research and test reactor facility, power reactor facility or reprocessing facility is installed;

(b) radioactive waste to be disposed of shall be a waste package;

(c) said waste package shall be as specified in the following paragraph:

(ii) in the case of pit disposal:

(a) radioactive waste to be disposed of shall be generated at the factory or place of business where a research and test reactor facility or power reactor facility is installed;

(b) radioactive waste to be disposed of shall be solidified concrete waste or a waste package;

(c) said waste package or solidified concrete waste shall be as specified in the following paragraph or paragraph (3);

(iii) in the case of trench disposal:

(a) radioactive waste to be disposed of shall be generated at the factory or place of business where a research and test reactor facility or power reactor facility is installed;

(b) radioactive waste to be disposed of shall be solidified concrete waste;

(c) said solidified concrete waste shall be as specified in paragraph (3).

Technical standards for a waste package are as follows:

(i) for the prevention of radiation hazards, radioactive waste shall be encapsulated in a vessel or solidified with a vessel by the method specified by the Nuclear Regulation Authority;

(ii) the radioactivity concentration shall not exceed the maximum radioactivity concentration stated in the application for.;

(iii) the surface density of radioactive material shall not exceed 10% of the surface density limit as set forth in Article 14, item (i), (c);

(iv) any material that may damage the integrity of the waste package shall not be included;

(v) ithe waste package shall have enough strength to bear the potential load that may be applied when landfilled;

(vi) there shall be no significant damage;

(vii) a radioactive waste sign shall be attached in a prominent place on the surface of the waste package so that it cannot be easily dislodged, and a serial number for cross checking said waste package with the details stated in the application form set forth in the preceding Article shall also be indicated.

Technical standards for solidified concrete waste are to be as follows:

(i) explosive materials shall not be included;

(ii) measures for cross checking said solidified concrete waste with the matters stated in the application form set forth in the preceding Article shall be taken.

Table H6-2 Matters to be specified in the Operational Safety Programs

(Article 34, Paragraph (1) of the Ordinance on Activity of Waste Storage of Nuclear Fuel Material or Material Contaminated by Nuclear Fuel Material)

(i) MATTERS concerning the system for complying with relevant laws and regulations, as well as the operational safety programs (including senior management involvement);

(ii) the system for developing a culture of safety (including senior management involvement);

(iii) quality assurance of the waste storage facilities (including matters concerning the method and system for conducting root cause analysis and positioning of the procedural manuals in the operational safety programs);

(iv) the duties of personnel engaged in the operation and management of waste storage facilities and their organization (excluding what is set forth in the following item);

(v) the duties and authority of chief engineers of radioactive waste,in supervising operational safety, and their positions in the organization;

(vi) education on operational safety for radiation workers at waste storage facilities:

(a) policies for providing education on operational safety (including the drawing up of an implementation plan);

(b) the details of education on operational safety:

1. compliance with the related laws and regulations, as well as operational safety programs;
2. the structure, functions, and operation of the waste storage facilities;
3. radiation control;
4. the handling of nuclear fuel material and material contaminated by nuclear fuel material;
5. actions to be taken in an emergency;

(c) education on operational safety pertaining the waste storage facilities;

(vii) the operation of sensitive equipment for operational safety;

(viii) the specification of radiation controlled areas and peripheral monitoring areas, as well as the access control to these areas;

(ix) exhaust monitoring equipment and effluent monitoring equipment;

(x) monitoring of doses, dose equivalents, concentration of radioactive material, and density of radioactive material on the surface of material contaminated by radioactive material, as well as the removal of contamination;

(xi) the management of radiation detectors and measurement methods;

(xii) the policing and checking of the waste storage facilities and accompanying actions;

(xiii) the periodic self-inspection of waste storage facilities;

(xiv) the reception, shipment, disposal and other handling of radioactive waste;

(xv) actions to be taken in an emergency;

(xvi) maintaining proper records and reports on operational safety at waste storage facilities (including the status of compliance with the operational safety programs). Such reports include ones made to senior management covering accidents and failures set forth in Article 35-16, or other incident equivalent thereto);

(xvii) periodic evaluation of the waste storage facilities;

(xviii) the sharing with other licensees of waste storage activity technical information on operational safety from the business operators conducting a maintenance checks;

(xix) information disclosure on non-compliance if any;

(xx) other matters necessary for operational safety pertaining to the waste storage facilities.

(Article 20, Paragraph (1) of the Ordinance on Activity of Category 2 Waste Disposal of Nuclear Fuel Material or Material Contaminated by Nuclear Fuel Material)

(i) MATTERS concerning the system for complying with relevant laws and regulations, as well as operational safety programs (including senior management involvement);

(ii) the system for developing a culture of safety (including senior management involvement);

(iii) quality assurance of the waste disposal facilities (including matters concerning the method and system for conducting root cause analysis and positioning of the procedural manuals in the operational safety programs);

(iv) the duties of those engaged in the operation and management of the waste disposal facilities and

their organization (excluding details set forth in the following item);

(v) the duties and authority of chief engineers of radioactive waste in supervising operational safety, and their positions in the organization;

(vi) education on operational safety for radiation workers working at waste disposal facilities:

(a) policies for providing education on operational safety (including the drawing up of an implementation plan);

(b) the details of education policies on operational safety:

1 compliance with relevant laws and regulations, as well as the Operational Safety Programs;

2. the structure, functions, and operation of the waste disposal facilities;

3. radiation control;

4. handling nuclear fuel material and material contaminated by nuclear fuel material;

5. actions to be taken in an emergency;

(c) education on operational safety at waste disposal facilities;

(vii) measures to be taken for the operational safety of Category 2 waste disposal in accordance with the attenuation of radioactivity;

(viii) the specification of the radiation controlled areas, peripheral monitoring areas and protection areas for disposal, as well as the access control to these areas;

(ix) exhaust monitoring equipment and effluent monitoring equipment;

(x) monitoring of doses, dose equivalents, concentration of radioactive material, and density of radioactive material on the surface of material contaminated by radioactive material, as well as the removal of contamination;

(xi) the monitoring of of the waste disposal sites and their immediate vicinity (excluding the monitoring set forth in item (x)) for the purpose of obtaining information necessary for the periodic evaluation of the waste disposal facilities under Article 19-2;

(xii) the management of radiation detectors and measurement methods;

(xiii) policing of waste disposal facilities and accompanying actions;

(xiv) the matters concerning the reception, transport, disposal and other handling of radioactive waste;

(xv) actions to be taken in an emergency;

(xvi) maintaining proper records and reports on operational safety at waste disposal facilities (including the status of compliance with the operational safety programs). Such reports include ones made to senior management in the event of accidents and failures, set forth in Article 22-17;

(xvii) periodic evaluation of waste disposal facilities;

(xviii) sharing with licensees of Category 1 waste disposal activity and licensees of Category 2 waste disposal activity of technical information on operational safety obtained from operators performing maintenance checks;

(xix) information disclosure on non-compliance if any;

(xx) other matters necessary for operational safety pertaining to the waste disposal facilities.

Table H6-3 Examples of Methods of Disposing of Radioactive Waste in the Place of Business where Nuclear Facilities are Installed

1. Gaseous radioactive waste

(1) Discharging such waste through exhaust facilities

The concentration of radioactive material in the exhaust should be reduced to the extent possible by filtration, radioactivity decay over time, dilution with a large amount of air, at the exhaust facilities. In this case, the concentration of radioactive material at the exhaust vent or exhaust monitoring equipment should be monitored to ensure that the concentration of radioactive material in the air outside the peripheral monitoring area will not exceed limit specified by the Nuclear Regulation Authority.

(2) Storing such waste for disposal in tanks that can prevent radiation hazards

2. Radioactive liquid waste

(1) Discharging such waste through the drainage facilities

The concentration of radioactive material in the effluent should be reduced at the drainage facilities by filtration, evaporation, adsorption using the ion-exchange resin method, radioactivity decay over time, and dilution with a large amount of water. The concentration of radioactive material in the effluent at the discharge port or effluent monitoring equipment should be monitored to ensure that the concentration of radioactive material in the water at the boundary outside the peripheral monitoring area will not exceed limits specified by the NRA.

(2) Storing such waste for disposal in drain tanks that can prevent radiation hazards

(3) Encasingwaste in a vessel or solidifying such waste with a vessel and storing said waste for disposal at storage disposal facilities that can prevent radiation hazards

a. When encasing radioactive waste in a container, said vessel shall conform to the following standards:

- The container has a structure that is resistant to corrosion,less permeable and prevents leaks of radioactive waste;
- The container is not subject to cracks or damage;
- The container lid is difficult to remove;

b. When solidifying radioactive waste with a container such a structure, can prevent a scatter or leak of radioactive waste.

c. When storing radioactive waste for disposal at a storage disposal facility the following procedures should be followed:

- When encapsulating the radioactive waste in a container and storing it for disposal, taking measures necessary to prevent the spread of contamination in the event of any cracks or damage to said container, such as by covering it with materials that can absorb radioactive waste or by installing a tray that can receive said radioactive waste;

・Attaching a radioactive waste sign to a container in which the radioactive waste is encapsulated or which is solidified with the radioactive waste, and indicating a serial number for cross checking said radioactive waste with recorded details based on the provisions of Article 44;

・Posting precautions for management in a prominent place at said storage disposal facilities;

(4) Incinerating waste in the incinerator to prevent radiation hazards

(5) Solidifying waste in solidification equipment that can prevent radiation hazards

(6) Landfilling waste in a disposal site in accordance with the technical standards for waste disposal facilities and the radioactive waste to be disposed of

The concentration of radioactive material in underground water in the peripheral monitoring area should be monitored the requiste underground equipment to ensure that the concentration of radioactive material at the boundary outside the peripheral monitoring area does not exceed limits specified by the Nuclear Regulation Authority.

3. Solid radioactive waste

(1) Incinerating waste to prevent radiation hazards

(2) Encasing waste in a container or solidifying such waste with a vessel and storing said waste for disposal at the storage disposal facilities:

a. When encapsulating radioactive waste in a vessel, said vessel shall conform to the following standards:

・The container is less permeable, resistant to corrosion and prevents radioactive leaks;

・The container is resistant to cracks or damage;

・The container lid is hard to remove;

b. When solidifying radioactive waste with a container such container integrally solidified with shall be capable of preventing a scatter or leak of radioactive waste.

c. When storing radioactive waste for disposal at a storage disposal facility to prevent radiation hazards, the following procedures are to be followed:

・Attaching a radioactive waste sign to a container in which the waste is encapsulated or which is solidified with the radioactive waste, and indicating a serial number for cross checking said radioactive waste with details recorded under the provisions of Article 44;

・Posting precautions for management in a prominent place at said storage facilities;

(3) With regard to cumbersme radioactive waste such as large machinery which is extremely difficult to dispose of under the method set forth in 2) above, or radioactive waste that requires radioactivity decay, storing such waste for disposal at storage facilities that can prevent radiation hazards

Precautions for wastemanagement should be posted in a prominent place at said storage disposal facilities.

(4) Landfilling such waste in a disposal site in accordance with the technical standards for the waste disposal facilities and radioactive waste to be disposed of

The concentration of radioactive material in underground water in the peripheral monitoring area

should be monitored by underground equipment, to ensure the concentration of radioactive material in the water at the boundary outside the peripheral monitoring area will not exceed limits specified by the Nuclear Regulation Authority.