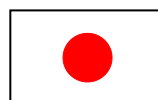


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Nuclear Legislation in OECD Countries

Regulatory and
Institutional Framework
for Nuclear Activities

Japan



Japan

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I. General Regulatory Regime

1. Introduction

Japan possesses a developed nuclear programme. Its 54 operational nuclear reactors had a total installed capacity of 48.847 GWe in 2010. These reactors supplied 280 TWh of electricity, which amounted to 29% of the total electricity generated in Japan. There are 9 operational research reactors in Japan.

The starting point of Japan's nuclear legislation is the Atomic Energy Basic Law (the Basic Law, No. 186, 19 December 1955). The Basic Law states that its objectives are to secure energy resources for the future and to promote the research, development and use of nuclear energy for peaceful purposes (Chapter 1). It goes on to establish a framework for the regulation of nuclear activities, specific aspects of which are to be dealt with in subsequent, separate acts. The Basic Law in Chapter 2 created the Atomic Energy Commission (AEC) and the Nuclear Safety Commission (NSC). Its provisions also deal in very broad terms with the mining of nuclear source materials (Chapter 4), control over nuclear fuel materials (Chapter 5), control over nuclear reactors (Chapter 6), protection from radiation hazards (Chapter 8) and compensation for damage caused by nuclear activities (Chapter 9). These provisions, in effect, do only demonstrate the state's intention to exercise regulatory powers in these areas by means of subsequent legislation. The most important of these later acts are:

- the Law for the Regulation of Nuclear Source Material, Nuclear Fuel Material and Reactors (Regulation Law, No. 166, 10 June 1957, as amended);
- the Law concerning Prevention from Radiation Hazards due to Radioisotopes etc. (Prevention Law, No. 167, 10 June 1957, as amended); and
- the Law on Compensation for Nuclear Damage (No. 147, 17 June 1961, as amended).

Pursuant to the Government Reorganisation Basic Law (No. 103, 12 June 1998) and various laws related to the administrative reform of the central government, adopted in July 1999, the Japanese Government was re-organised on 1 January 2001. Before the re-organisation, responsibilities for the regulation of nuclear activities were with both the Science and Technology Agency (STA) and the Ministry of International Trade and Industry (MITI) depending on the type of activity involved. Following the re-organisation, the STA, which previously reported directly to the former Prime Minister's Office (now the Cabinet Office), merged with the Ministry of Education and became the Ministry of Education, Culture, Sports, Science and Technology (MEXT), while MITI became the Ministry of Economy, Trade and Industry (METI).

The Law on Final Disposal of High-Level Radioactive Waste (No. 117, 7 June 2000), provides a legislative framework governing the underground disposal of high-level radioactive waste in Japan. It contains provisions governing the definition and implementation of policy and the final disposal plan, the funds to finance such disposal activities, the entity responsible for carrying them out, and procedures to be used for site selection. The Nuclear Waste Management Organisation was established in October 2000, as a private law company, with no funds provided by the government. This organisation was set up by the private sector and approved by the Minister of Economy, Trade and Industry. It is responsible for the implementation of final geological disposal of high-level radioactive waste and for the collection of fees necessary to fund its disposal activities.

2. Mining regime

The Basic Law states that special provisions dealing with the mining of nuclear source material may be established by subsequent laws (Section 8). It also states that legislation may provide that the government may acquire all nuclear source material, control all dealings with nuclear source material and encourage the development of nuclear source material by means of subsidies and other financial incentives (Sections 9-11). The Power Reactor and Nuclear Fuel Development Corporation (PNC) withdrew from activities related to prospecting for nuclear source material in 1998 when it was reorganised as the Japan Nuclear Cycle Development Institute (JNC). Later, the JNC merged with the Japan Atomic Energy Research Institute (JAERI) to create the Japan Atomic Energy Agency (JAEA) (see Part II, Chapter 3 “public and semi-public agencies”).

3. Radioactive substances, nuclear fuel and equipment

Activities involving radioactive substances are governed by the Prevention Law while activities connected with the nuclear fuel cycle come within the scope of the Regulation Law.

The principal purpose of the Prevention Law is radiation protection and to this end it regulates the use, sale, lease, disposal etc. of radioisotopes and ionising radiation-generating equipment. In general, any person that wishes to use radioisotopes or ionising radiation-generating equipment must obtain a licence to do so from the Minister of Education, Culture, Sports, Science and Technology (Section 3). The application must contain information about intended use, location, radiation safety measures to be observed, etc. The Minister may attach conditions to the licence (Section 8) and may suspend or cancel it if there is non-compliance with the law or any condition thereof. The sale of radioisotopes is subject to licensing conditions similar to those regarding their use (Section 4). The use of sealed sources containing radioisotopes below a prescribed quantity is exempt from licensing requirements, but advance notification to the same Minister is necessary (Section 3). The Prevention Law also contains criminal sanctions (fines and imprisonment) for non-compliance with its provisions (Chapter VII).

The purpose of the Regulation Law is to ensure the peaceful use of nuclear source material, nuclear fuel and nuclear reactors. It provides for a comprehensive licensing regime covering the following nuclear activities: refining nuclear source material, manufacture and use of nuclear fuel, construction, operation and decommissioning of reactors, storage and reprocessing of spent nuclear fuel, disposal of radioactive waste, and any other use of internationally controlled material (that is, material subject to internationally agreed safeguards).

The Regulation Law requires that a person (other than an entity controlled by the government) that wishes to carry out a refining activity must obtain the authorisation of the Minister of Economy, Trade and Industry (Section 3). Applications for a licence must contain information on the planned design, proposed safety measures and the intended construction and refining methods for the facility. The advice of the Atomic Energy Commission and the Nuclear Safety Commission must be obtained by METI before the licence is granted (Section 4). Licensees are required to keep records of their operations as prescribed by order of METI (Section 11).

Licensing requirements similar to those for refining activities apply to nuclear activities covered by the Regulation Law. The licensing authority differs depending on the nuclear activities involved. METI is responsible for the licensing of reactors used for electricity generation, including those at the research and development stage, and for uranium milling, refining of nuclear source material, the manufacture of nuclear fuel, reprocessing and storage of spent nuclear fuel, and disposal of radioactive waste, while MEXT is responsible for the licensing of research reactors, reactors not used for electricity generation, including those at the research and development stage, and facilities using nuclear fuel.

Until 1980, reprocessing of spent fuel could be carried out only by the Power Reactor and Nuclear Fuel Development Corporation (PNC) and the Japan Atomic Energy Research Institute (JAERI), both of which have been merged into a single entity named Japan Atomic Energy Agency

(JAEA). However, an amendment to the Regulation Law, adopted on 20 June 1979, enabled the Prime Minister to authorise private companies to carry out such activities. Since the re-organisation of the government in 2001, METI has been assigned the power to grant such authorisations. The Regulation Law specifies certain conditions which must be met by such companies and provides for government supervision and inspection during the construction, operation and decommissioning of the reprocessing facility (Sections 44-51).

4. Nuclear installations

a) Licensing and inspection, including nuclear safety

The Regulation Law governs the siting, construction and operation of nuclear facilities. Two Cabinet ordinances establish the details of a comprehensive licensing system: the Ordinance implementing the Regulation Law (Cabinet Order No. 324, 21 November 1957) and the Ordinance for the Definition of Nuclear Fuel Material, Nuclear Source Material, Reactors and Radiation (Cabinet Order No. 325, 21 November 1957). The Prevention Law is also relevant in relation to the safety aspects of nuclear facilities.

Responsibility for the establishment, operation and decommissioning of a nuclear facility depends on the type of facility involved. METI is responsible for reactors used for electricity generation, including those at the research and development stage, and nuclear fuel fabrication facilities, spent fuel storage facilities, spent fuel reprocessing facilities and waste disposal facilities. The Minister of Education, Culture, Sports, Science and Technology is responsible for granting approval for the construction, operation and decommissioning of research reactors, reactors not used for electricity generation, including those at the research and development stage, and for the use of nuclear fuel material for activities not covered by other licences. The Minister of Land, Infrastructure and Transport is responsible for nuclear powered ships. Except for the licence of the use of nuclear fuel material, both the Atomic Energy Commission and the Nuclear Safety Commission are involved in advising the appropriate licensing authority.

The Environmental Impact Assessment Law (No. 81, 9 June 1997) establishes a general procedure for the environmental impact assessment of large scale projects which could have a significant impact on the environment, including the construction of a power plant.

The licensing procedure of reactors is divided into three main stages: approval of a particular site, the granting of a construction licence and, finally, approval to operate the installation. A construction licence for a reactor can only be granted if the minister responsible is satisfied that the reactor will be used only for peaceful purposes, the construction is consistent with the national "framework for nuclear energy policy", the applicant has the necessary technical and financial resources, and the location, structure and equipment of the reactor all comply with safety requirements (Regulation Law, Section 24). Before granting a licence, the minister in charge must seek the views of both the AEC and the NSC on the proposal (Section 24-2). Once the construction licence has been granted, no change is allowed unless approval has been sought and obtained for the change from the minister (Section 26). Before the reactor can begin to operate, an inspection must be carried out to the satisfaction of the minister that the construction conforms to the approved design and methods and to all the relevant technical standards (Section 28). The operator must also have an approved set of safety rules and procedures in place before operations may commence (Section 37). The operator is subject to an annual inspection of the facility by the relevant ministry (Section 29) and must also provide an operating plan which conforms to the requirements set out for such plans in orders issued by the ministry (Section 30).

A licence may be revoked if the operator has failed to comply with the obligations pursuant to the Regulation Law, any applicable orders made under the Regulation Law or any licence condition (Section 33).

Several regulations made under the Regulation Law deal in detail with the various categories of reactor. The Regulations concerning the Installation, Operation, etc. of Commercial Nuclear Power Reactors (MITI Ordinance No. 77, 28 December 1978, as amended) cover application

procedures for commercial reactor design construction and alteration of facilities, limits on access to controlled areas, storage of nuclear materials and waste and security measures. The construction and operation of research reactors are dealt with under the Regulations concerning Installation, Operation etc. of Nuclear Reactors in Use for Testing and Research Purposes (Prime Ministerial Ordinance No. 83, 1957).

The Regulation Law also contains penalties for various activities subject to the Law (Chapter VIII).

In relation to nuclear safety, the Regulation Law was amended in order to strengthen the nuclear safety requirements within nuclear facilities (Law No. 157, 13 December 1999). In this respect, periodic inspections of processing facilities, compulsory notification of their dismantling, and regular checks on the management and operational procedures of nuclear energy facilities are required to ensure compliance with safety regulations. The law furthermore provides for the appointment of inspectors for safety management of nuclear installations under MEXT and METI in order to carry out such inspections. Nuclear operators are also required to organise safety training for radiation workers.

Japan accepted the 1994 Convention on Nuclear Safety on 12 May 1995.

Finally, it should be noted that Section 6 of the Law on Compensation for Nuclear Damage (No. 147, 17 June 1961) prohibits the operation of a nuclear installation if the financial security for damage required by the law is not in place in respect of that installation.

b) Emergency response

The Special Law on Emergency Preparedness for Nuclear Disaster (hereinafter referred to as "the Special Law", No. 156, 17 December 1999) aims to enforce countermeasures in the event of a nuclear emergency. In this respect it modifies and complements the countermeasures against natural disasters described in the Basic Law on Emergency Preparedness (No. 223, 15 November 1961).

Under the Special Law, the nuclear operator must take measures to prevent nuclear emergencies, prepare an Emergency Plan, in consultation with mayors and prefectural governors, and establish a Nuclear Disaster Prevention Organisation. This organisation is responsible for taking necessary measures to prevent or mitigate nuclear emergencies.

The nuclear operator shall also appoint a manager for nuclear disaster prevention who will be responsible for supervising the activities of this organisation. The manager shall inform the competent ministers, mayors and governors of municipalities and prefectures promptly after such an event has taken place and, upon the request of governors or mayors, the competent ministers shall dispatch their appropriate personnel.

The nuclear operator is also required to install and maintain equipment for measuring radiation doses and to provide special radiation protection clothes, emergency communication equipment, etc.

Relevant ministers are to establish Off Site Centres, which shall take necessary measures in the event of an emergency situation, in each prefecture where a nuclear installation is located.

In the event of an emergency situation, the Prime Minister issues a Notification Nuclear Emergency Situation, notifies the public in the area where urgent countermeasures must be adopted and gives evacuation instructions to the mayors and governors of relevant municipalities and prefectures.

The Special Law further provides that, in the event of an emergency situation, several structures will be established:

- Within the Cabinet Office, Nuclear Disaster Countermeasures Headquarters shall be created, and in emergency situations the Prime Minister, as the superintendent of the headquarters, may request the Defence Minister to dispatch the Self Defence Force. He may also request technical advice regarding the implementation of urgent countermeasures from the Nuclear Safety Commission.
- A Joint Council of Nuclear Disaster Countermeasures shall be set up within the off-site centre in order to facilitate exchange of information and cooperation among the various organisations concerned.

The government, local authorities, relevant organisations and operators shall take urgent measures such as notifying information, evacuation, collecting information including radiation dose rate, rescuing victims, controlling emergency transportation, measuring exposure dose rate of residents, etc., within their respective fields of competence.

Lastly, in order to inform nuclear operators about emergency prevention measures and to collect information in the event of an emergency, MEXT and METI appoint specialists in nuclear emergency preparedness at each nuclear installation.

At the international level, Japan is party to the 1986 Conventions on Early Notification of a Nuclear Accident and the Convention on Assistance in the Case of a Nuclear Accident or Radiological Emergency, both on 9 June 1987.

5. Trade in nuclear materials and equipment

While Japan imports nuclear fuels, materials and technology, it also has a highly developed nuclear industry and the corresponding potential to supply numerous nuclear and nuclear related services and equipment.

Japan has a clearly defined nuclear export policy based on assurance of peaceful uses and non-proliferation, including compliance with the guidelines for nuclear export, elaborated by the Nuclear Suppliers Group.

In 1962, the Atomic Energy Commission issued a policy statement to the effect that nuclear materials, reactor cores and units for the reprocessing of special nuclear materials, exported from Japan, be used solely for peaceful purposes, thus setting a fundamental principle for nuclear exports control, consistent with the principles of the Basic Law (Section 2).

The Regulation Law provides for control of nuclear material and equipment while the Prevention Law regulates the sale of radioactive materials and radiation-emitting equipment.

The Regulation Law restricts the transfer, import and export of nuclear fuel to licensees for refining, manufacturing, or reprocessing such material, construction of nuclear reactors and the use of nuclear fuel material (Section 61). These restrictions do not apply where the government receives or transfers nuclear fuel at the national level or in accordance with international arrangements.

The sale and import of radioisotopes for medical purposes are governed by the Medical Supplies Act (No. 145, 1960) and are subject to licensing requirements. Trade in medical X-ray apparatus is regulated by an Ordinance of the Ministry of Health, Labour and Welfare and is subject to notification, but not licensing, requirements.

The import and export of nuclear materials and equipment are also subject to the provisions of general trade law, namely the Foreign Exchange and Foreign Trade Act (No. 228, 1 December

1949, as amended) and its implementing orders and regulations which describe the procedures for obtaining import and export licences and approvals. METI is responsible for this act and its implementing legislation. Nuclear material and equipment are classified as “exceptional items” which means that prior approval must be obtained for their export and importation. The Import Trade Control Ordinance (Cabinet Ordinance No. 414, 29 December 1949) and the Export Trade Control Order (Cabinet Ordinance No. 378, 1 December 1949) contain the basic rules for import and export activities, while the procedures to be followed to obtain the necessary licence are set out in the Import Trade Control Regulations (MITI Ordinance No. 77, 1949) and the Export Trade Control Regulations (MITI Ordinance No. 64, 1 December 1949).

6. Radiation protection

Both the 1957 Law concerning Prevention from Radiation Hazards (Prevention Law) as amended and the 1957 Law on the Regulation of Nuclear Source Material, Nuclear Fuel Material and Reactors (Regulation Law) as amended govern radiation protection issues.

The aim of the Prevention Law is to regulate the use, sale, lease, disposal or any other handling of radioisotopes and ionising radiation-generating equipment in order to prevent ionising radiation hazards and to secure public safety (Section 1). Pursuant to this law, applications must be submitted to the Minister of Education, Culture, Sports, Science and Technology for any activity connected with radioisotopes or ionising radiation-generating equipment. Granting of the licence depends on whether the site, structure and equipment proposed conform to the standards laid down by the Ordinance of the Prime Minister (No. 56, 30 September 1960), and whether potential hazards from ionising radiation have been dealt with satisfactorily (Sections 6, 7 and 7-2). The Prevention Law also sets out dose limits for exposure to ionising radiation. The limit is 50 mSv per year for workers whose work involves radiation activities,¹ and 1 mSv per year for members of the public. In 1980, the Prevention Law was amended to introduce a system of inspection and approval of radioisotopic equipment and to prescribe compulsory training courses for radiation protection supervisors. The amendments also established a training institution to conduct these courses. In 1995, further amendments established a system for leasing radioisotopes and simplified the licensing system for the use of radioisotopes with a lower risk of radiation hazard. The simplification of the licensing system has been strengthened by an amendment of 2004. In addition, there are also the Regulations on the Prevention of Ionising Radiation Hazards (Ordinance of the Ministry of Labour, No. 41, 30 September 1972).

The Nuclear Safety Commission, which has a significant advisory role in the licensing process for nuclear installations, was established in 1978 to take over responsibility for safety issues formerly dealt with by the Atomic Energy Commission. It is responsible *inter alia* for protection against hazards resulting from the use of nuclear energy and radioactive fallout.

7. Radioactive waste management

The legislation applicable to the management of waste resulting from nuclear reactor operations is the Regulation Law. In relation to waste resulting from the use of radioisotopes and ionising radiation-emitting equipment, the Prevention Law is applicable. Furthermore, a Law on Final Disposal of High Level Radioactive Waste (No. 117, 31 May 2000) governs the geological disposal of such waste.

Waste management policy is determined by the Atomic Energy Commission (basic policy) and the Nuclear Safety Commission (safety aspects), and that policy is implemented through the licensing system for nuclear activities. Pursuant to Chapter V-II of the Regulation Law, the

1. However the limit for exposure to ionising radiation is 100 mSv for a period of 5 years; i.e. if a worker has been exposed to radiation of 50 mSv for 2 years, then he cannot be exposed to ionising radiation for the following 3 years.

application may be submitted to METI for a licence to engage in nuclear waste disposal activities (Section 51-2). The licence may authorise either the storage of waste or (in the case of low-level waste) its final disposal by underground burial.

The application for a licence must include information about the type of waste and its properties, the location of the proposed storage or disposal facilities, a safety plan, an engineering plan and a management plan. The application must also establish that the project has adequate technical and financial resources. The site must conform to standards specified in the relevant ordinances from the former Prime Minister's Office (now the Cabinet Office) and METI ordinances. Once the licence has been granted, the operator of the waste management facility is subject to supervision and inspection by METI at regular intervals (Sections 51-8 to 51-10).

Regarding high-level radioactive waste, a Nuclear Waste Management Organisation² was established as a private law company pursuant to the Law on Final Disposal of High-level Radioactive Waste (Section 40 of Law No. 117 of 2000). This Organisation, which is supervised by METI, is entrusted with the task of implementing the final disposal of high-level radioactive waste. It is responsible for all steps involved in the disposal of radioactive waste, from the selection of the site and preliminary investigations to post-closure management of disposal facilities. The operators of nuclear power plants shall pay a specific fee, determined by the Ministry, to this Organisation every year. High-level waste originating from research and experimental reactors is not subject to an annual fee, but may be accepted by the Organisation for final disposal if this does not disrupt normal business activity.

In selecting the final disposal site, the Organisation shall follow a three-step procedure. First, it shall select a preliminary survey site, following the results of a survey on geological disturbances caused by earthquakes or other natural phenomena (Section 6). At that site, tests shall be carried out to determine the stability of the geological stratum, resulting in the choice of a specific survey site (Section 7). Finally, the Organisation shall select a site where the final disposal facilities are to be constructed (Section 8). METI is to review the final disposal plan upon selection of the final disposal site by the Organisation, taking into account the opinions of the heads of local government where the site is located.

Should the Organisation encounter difficulties in continuing operations, METI shall take over its responsibility until appropriate measures, such as the transfer of its operations, shall be established by legislation.

The Prevention Law has a series of provisions dealing with the obligations of those responsible for the disposal of radioisotopes and material contaminated by radioisotopes (Sections 19-26). Measures to prevent ionising radiation hazards must be taken, in accordance with the technical standards laid down by ordinances of the Prime Minister's Office and MEXT. Failure to comply with these standards may result in the minister ordering the suspension of the disposal activities. Records must be kept of disposal activities and of the results of monitoring radiation levels at waste storage and disposal facilities. Further provisions require that all waste disposal operators develop their own internal rules for the prevention of radiation hazards, that these rules be approved by MEXT, and that training and medical examinations be made available to all employees entering waste storage and disposal facilities.

As far as the dumping of radioactive waste at sea is concerned, Japan has been a party to the 1972 London Convention on Prevention of Marine Pollution by the Dumping of Waste and Other Matters since 15 October 1980. Up until early 1994, the convention permitted the dumping at sea of certain low-level radioactive waste. However, in 1993, Japan's Atomic Energy Commission decided to discontinue dumping at sea as a means of disposal and, since 20 February 1994, all parties to the convention have become bound by a 25-year ban on the dumping at sea of any radioactive waste.

2. www.numo.or.jp/english/index.html.

8. Nuclear security

Provisions regarding the peaceful use of nuclear materials are established in the Basic Law and the Regulation Law. The Basic Law states that research into, development and use of nuclear energy shall be limited to peaceful purposes and provides, inter alia, that import, export, possession etc. of nuclear fuel shall be subject to regulations for control purposes (Section 12). The Regulation Law lays down detailed regulations for the different types of nuclear activities, including provisions for control of the use of internationally controlled material (Chapter VI-II). The Regulation Law defines such material as nuclear source material, nuclear fuel material, reactors and other material or equipment to which safeguards and other regulations are applied pursuant to the Safeguard Agreement concluded with the International Atomic Energy Agency (IAEA) and other agreements concluded with foreign governments or international organisations, except for the Additional Protocol to the Safeguard Agreement, in relation to research, development and use of nuclear energy (Section 2).

The Ministry of Education, Culture, Sports, Science and Technology (MEXT) bears responsibility for the peaceful uses of nuclear energy. The Nuclear Safety Division within the Science and Technology Policy Bureau is in charge of safeguards. Chapter VII of the Regulation Law provides that inspectors appointed by METI, MEXT and the Ministry of Land, Infrastructure and Transport (MLIT) are to have access to the offices, facilities or places where nuclear fuel is located in order to carry out controls as required by this Law. If premises contain internationally-controlled material, persons appointed by the supplier state or IAEA inspectors also have inspection powers. Japan accepted to apply IAEA safeguards to nuclear material in conformity with its obligations under the Nuclear Non-Proliferation Treaty (Section 68). On 16 June 1999, new provisions were added to the Regulation Law to incorporate the requirements of the Additional Protocol to the Safeguard Agreement, which Japan signed within the framework of the IAEA in 1998.

The Regulation Law provides that people engaged in any of the nuclear activities to which it applies (refining, manufacture, reactor operation, storage of spent fuel, reprocessing, waste disposal and use of nuclear fuel material) are responsible for establishing rules for the physical protection of specified nuclear materials in their establishments. These rules must conform to requirements specified in various ministerial orders. The orders are issued by different ministers, depending on the type of nuclear activity addressed. MEXT issues orders laying down a framework for physical protection in relation to research reactors which are not used for power generation and use of nuclear materials, while METI has a similar responsibility in relation to power reactors, refining, manufacture, reprocessing and waste disposal, and MLIT is responsible for nuclear ships.

The physical protection rules established by an operator of nuclear installations can only be modified with the approval of the minister responsible (who also has the power to order that certain modifications be made). The operator must appoint a physical protection supervisor to ensure compliance with the rules. In 2005, the Regulation Law was amended to introduce a periodical inspection system, according to the revision of IAEA's guidelines for physical protection.

The Criminal Radiation Emission Act establishes criminal offences for acts that threaten human lives, etc. by releasing radiation. The act entered into force on 2 September 2007 and incorporates the provisions of the International Convention for the Suppression of Acts of Nuclear Terrorism which was adopted on 13 April 2005 and entered into force on 7 July 2007 and which Japan accepted on 3 August 2007.

Japan has been a party to the 1968 Treaty on the Non-Proliferation of Nuclear Weapons since 8 June 1976 and to the 1979 Convention on the Physical Protection of Nuclear Material since 28 October 1988. It also ratified the 1996 Comprehensive Nuclear-Test-Ban Treaty on 8 July 1997.

9. Transport

The administrative requirements and safety standards applicable to the transport of radioactive materials in Japan are set out in ordinances by the Ministry of Economy, Trade and Industry

(METI), the Ministry of Education, Culture, Sports, Science and Technology (MEXT) and the Ministry of Land, Infrastructure and Transport (MLIT), which incorporate the 1996 Edition of the IAEA Regulations for the Safe Transport of Radioactive Material (as amended in 2005) into domestic law.

In order to prevent exposure to radiation and, in the case of fissile materials, to prevent criticality casualties, during the transport of radioactive materials, different governmental agencies are responsible for the application of laws and ordinances for the different modes of transport, with classification of packages into different categories according to the specific radioactivity, form, characteristics and total radioactivity of the contained radioactive materials and the dose equivalent rate from the packages.

Transport by rail and road is governed by various regulations adopted by MEXT, METI and MLIT pursuant to the Regulation Law (for nuclear materials) and the Prevention Law (for radioisotopes). Such transport operations are supervised by MEXT, METI and MLIT to ensure that technical standards are met. The procedure is as follows:

1. MEXT, METI and MLIT issue a certificate of package design approval after examination of the package's safety in terms of structure, material, manufacture, handling, maintenance control etc. MEXT issues orders laying down a framework for transport in relation to research reactors and use of nuclear materials, while METI has a similar responsibility in relation to commercial power reactors, refining, fabrication, reprocessing and waste disposal, and MLIT is responsible for reactors in operation on nuclear ships.
2. If MEXT, METI and MLIT are satisfied that it has been manufactured in accordance with the approved design, and in light of inspections and tests in relation to material, dimensions, welding, pressure, heat conditions, shielding, etc., they assign registration numbers to the individual packages and issue the applicant with a packaging approval certificate.
3. Prior to each transport operation, the applicant also applies to MEXT, METI and MLIT to have the packages approved. Having confirmed that they are in conformity with (1) and (2) above and that they meet standards regarding the appearance of the packages, surface dose equivalent rate and leakage, the certificate of confirmation is issued.
4. Prior to each transport operation, the applicant furthermore applies to MLIT for approval of the method of transport. Upon confirmation that the mode of transport (method of loading of the packages on the vehicles, marking and labelling, loading limits, etc.) are in conformity with the technical standards, the Ministry issues a certificate of approval.
5. Prior to each shipment, the applicant must formally notify the prefectural Public Safety Committee (PSC) of the specific transport plans. The PSC then gives guidance and instruction on safety issues, if necessary, and issues a permit for the transport operation.

With regard to maritime transport, basically the same procedure as applies to transport by rail and road is followed, except that the competent bodies are MLIT and the Japan Coast Guard. The applicable legislation is the Ship Safety Law (No. 11, 15 March 1933), which has incorporated the provisions of the IAEA Regulations for the Safe Transport of Radioactive Materials concerning packages and the provisions of the International Maritime Organisation's (IMO) 1974 International Convention for the Safety of Life at Sea (SOLAS) concerning the structure and facilities of the ship. In the case of combined land and maritime transport, packages are approved by MEXT, METI and MLIT on the basis of the Regulation Law (or the Prevention Law for radioisotopes). This approval procedure is sufficient to satisfy the conditions of the Ship Safety Law. Prior notification in the case of maritime transport is provided to the Head of the Regional Maritime Safety Headquarters of the Japan Coast Guard with jurisdiction over the port of departure of the ship.

In relation to air transport, the procedure outlined above with regard to land transport is also followed; in this particular field the competent body is MLIT. The applicable legislation is the Civil Aeronautic Law (No. 231, 15 July 1952). In the case of combined land and air transport, packages are approved by MEXT, METI or MLIT on the basis of the Regulation Law (or the Prevention Law for radioisotopes), which is sufficient to satisfy the conditions of the Civil Aeronautic Law.

10. Nuclear third party liability

Japan is not a party to any international convention on civil liability for nuclear damage. However, it has established a national regime dealing with compensation for nuclear damage which incorporates a number of the principles embodied in the international third party liability regimes. The four major legislative instruments to be considered in this context are the:

- Law on Compensation for Nuclear Damage (No. 147, 17 June 1961, as amended),
- Ordinance implementing the Law on Compensation for Nuclear Damage (Cabinet Ordinance No. 44, 6 March 1962, as amended),
- Law on Indemnity Agreements for Compensation for Nuclear Damage (No. 148, 17 June 1961, as amended) and
- the Ordinance implementing the Law on Indemnity Agreements for Compensation for Nuclear Damage (Cabinet Ordinance No. 45, 6 March 1962, as amended).

The Compensation Law provides for the strict, exclusive and unlimited liability of the operator of a nuclear installation (Sections 3 and 4) in respect of nuclear damage resulting from the operation of his installation [Section 3(1)]. "Nuclear damage" is defined as any damage caused by the effects of the fission process of nuclear fuel, or of the radiation from nuclear fuel etc., or of the toxic nature of such materials (Section 2). The Compensation Law requires each installation to be insured for a prescribed amount (pursuant to the amendment of 17 April 2009 to the Compensation Law, JPY 120 billion for the operation of nuclear reactors) (Section 7) and prohibits the operation of the installation if the required financial security is not in place (Section 6).

In addition to the funds available from the operator's insurance, the Law on Indemnity Agreements provides that the government may conclude an agreement with the operator according to which it will indemnify the operator for the amount paid in compensation for the damage uncovered by the operator's private insurance. This indemnity is of particular importance in the event of nuclear damage resulting from earthquakes or volcanic eruptions as this type of damage is not covered by private liability insurance. The maximum amount that can be provided under the indemnity agreement is equal to the prescribed amount of the operator's private insurance. The operator is required to pay an annual fee to the government in order to benefit from this indemnity arrangement.

Finally, the Compensation Law also provides for the possibility of government aid, under certain conditions, where the cost of nuclear damage exceeds the amount of the operator's financial capacity [Section 16(1)].

According to Section 3 the operator is exonerated from liability for damage caused by a "grave natural disaster of an exceptional character or by an insurrection". The acts distinguish thus between natural disasters of a grave exceptional character (exonerated) and those which are not of an exceptional character (subject to indemnity agreements). Where the exoneration in Section 3 applies, Section 17 stipulates that the government "shall take the necessary measures to relieve victims and to prevent the damage from spreading".

Jurisdiction to hear a claim for compensation for nuclear damage is determined by the ordinary rules of civil litigation. Under Section 724 of the Civil Code, the right to compensation for damage shall be extinguished if an action is not brought to Court within three years from the date

on which the person suffering damage had knowledge both of the damage and of the person liable for such damage. The right to compensation shall also be fully extinguished 20 years after the date on which a tort occurs.

The Compensation Law provides for the possibility of referring a claim to a Dispute Reconciliation Committee for Nuclear Damage Compensation in the event of accidents, whose function would be to mediate in respect of disputes concerning compensation (Section 18). Since 1999, the Committee met to settle on compensation for the damage caused by the Tokai-Mura criticality accident.

Pursuant to a 1994 amendment of the Compensation Law (No. 85), nuclear damage which occurs due to the operation of a nuclear reactor (including fuel manufacture, spent fuel reprocessing, etc.) is outside the scope of the Product Liability Law. This distinction was required because the Compensation Law provides for the exclusive liability of the nuclear operator, whereas within the meaning of the Product Liability Law, not only the nuclear operator but also a supplier of a nuclear reactor or nuclear fuel material could be liable as a "producer etc".

II. Institutional Framework

1. Regulatory and supervisory authorities

Responsibility for the regulation of nuclear activities is vested in the Minister of Economy, Trade and Industry (METI), the Minister of Education, Culture, Sports, Science and Technology (MEXT) and the Minister of Land, Infrastructure and Transport (MLIT) according to the type of activity involved.

a) Cabinet Office

The Basic Law initially provided for the establishment of an Atomic Energy Commission (AEC), within the former Prime Minister's Office (now the Cabinet Office), for the purpose of developing national policies on the research, development and use of nuclear energy (Section 4). In 1978, the AEC's responsibilities were divided and a Nuclear Safety Commission (NSC) was created, also within the former Prime Minister's Office, to take over responsibility for the safety aspects of nuclear activities (for more details on the AEC and the NSC see infra under Section 2 "Advisory bodies").

b) Minister of Economy, Trade and Industry (METI)

In January 2001, the former Ministry of International Trade and Industry (MITI) was reorganised and the Ministry of Economy, Trade and Industry (METI) was established pursuant to the Law for the Establishment of this Ministry (No. 99, 16 July 1999). METI is responsible for securing a stable and efficient energy supply, and for the uses of nuclear energy, including policy making in this field and the development of nuclear technology. METI is also empowered to govern safety regulation and licensing of nuclear energy utilisation, namely milling and refining, nuclear fuel fabrication, nuclear power generation, reprocessing and storage of spent nuclear fuel, and disposal of radioactive waste.

i) The Agency for Natural Resources and Energy (ANRE)

The Agency of Natural Resources and Energy (ANRE) is established within METI. Its tasks are to ensure a stable and efficient supply of energy (including from mineral resources), to promote appropriate uses of energy and to ensure industrial safety. It is headed by a director general and is divided into the Director-General's Secretariat, the Energy Conservation and Renewable Energy

Department, the Natural Resources and Fuel Department and the Electricity and Gas Industry Department. The Electricity and Gas Industry Department is divided into six divisions, including the Nuclear Energy Policy Planning Division and the Nuclear Fuel Cycle Industry Division. The Nuclear Energy Policy Planning Division administers nuclear energy policy, nuclear energy technology development, and development, improvement and co-ordination of nuclear radioactive waste management. It also oversees the work of the Japan Atomic Energy Agency (JAEA). The Nuclear Fuel Cycle Industry Division is responsible for ensuring a stable and efficient supply of nuclear materials, technology development for nuclear fuel materials, and nuclear facility siting.

The ANRE is assisted in its work by the Advisory Committee for Energy and the Electricity Utility Industry Council.

ii) The Nuclear and Industrial Safety Agency (NISA)

During the reorganisation of the government in January 2001, a Nuclear and Industrial Safety Agency (NISA) was established as a special organisation within the ANRE. It is responsible for regulating both nuclear and industrial safety. The drafting of safety regulations and the licensing of milling and refining, nuclear power reactors, nuclear fuel fabrication, reprocessing and storage of spent nuclear fuel, and disposal of radioactive waste are now carried out by NISA.

NISA is assisted in its work by the Nuclear and Industrial Safety Sub-Committee and by the Advisory Committee for Natural Resources and Energy.

iii) Nuclear Waste Management Organisation (NUMO)

In accordance with the 2000 Law on Final Disposal of High-level Radioactive Waste, the Nuclear Waste Management Organisation of Japan (NUMO) was established in 2000 as the organisation responsible for implementing high-level radioactive waste (HLW) disposal. It was set up by the METI. NUMO is responsible for implementation of final geological disposal of HLW and for collection of the fees necessary to fund its disposal activities.

c) Minister of Land, Infrastructure and Transport (MLIT)

During the reorganisation of the government in 2001, the Ministry of Transport, the Ministry of Construction, the Hokkaido Development Agency and the National Land Agency merged to become the Ministry of Land, Infrastructure and Transport (MLIT). It is responsible for all forms of transport of radioactive materials. In relation to transport by rail or road, the Regulation Law and the Prevention Law provide that this responsibility is shared with MEXT. Both the Ship Safety Law (No. 11, 15 March 1933) regulating the transport of radioactive materials by sea and the Civil Aeronautics Law, 1952, regulating the transport of radioactive materials by air are administered by MLIT.

d) Minister of Education, Culture, Sports, Science and Technology (MEXT)

In January 2001, the Science and Technology Agency (STA) merged with the Ministry of Education to become the Ministry of Education, Culture, Sports, Science and Technology (MEXT) pursuant to the Law for the Establishment of this Ministry (No. 96, 16 July 1999). This Ministry is responsible for the science and technology aspects of nuclear energy, including policy making in this field, development of nuclear technologies, safety regulations governing research reactors, protection against radiation hazards, the use and transportation of nuclear materials, except those originating in nuclear fuel cycle facilities and nuclear power plants, the use, storage and transportation of radioisotopes and the peaceful uses of nuclear energy (safeguards). The Ministry is also responsible for nuclear third party liability.

The Ministry comprises a Secretariat, seven Bureaux and a Director General for International Affairs. Nuclear regulations are administered by the Science and Technology Policy Bureau.

The Science and Technology Policy Bureau is divided into six divisions: policy, research and co-ordination, infrastructure policy, nuclear safety, planning and evaluation, and international

science and technology affairs. The policy division co-ordinates all the work of the Bureau and is responsible for the planning and co-ordination of science and technology policy. The research and co-ordination division co-ordinates the budget for the promotion of science and technology and deals with collection, research and analysis of science and technology information inside and outside Japan. The infrastructure policy division plans and co-ordinates the overall policy for the promotion of science and technology and deals with the education and training of nuclear researchers and technical experts. The nuclear safety division is responsible for nuclear safety, including disaster prevention, radiation safety, monitoring of environmental radioactivity, safeguards and safety regulations governing the use of nuclear materials, research reactors and reactors not used for electricity generation at the research and development stage. The nuclear safety division also provides administrative support to the Radiation Council. The Director General for International Affairs is in charge of policy planning of international co-operation in the field of science and technology.

The Research Promotion Bureau is divided into seven divisions, including the Office for Quantum Radiation Research which is responsible for the infrastructure supporting nuclear technology development, radiation use and the use of radioisotopes. It is also responsible for the high energy accelerator.

The Research and Development Bureau consists of seven divisions, including the research and development policy division, which co-ordinates all the work of the Bureau and deals with natural disaster prevention technology and nuclear facility siting. The atomic energy division is responsible for the nuclear research policy and programmes including their budget. It is also responsible for policy related to nuclear third party liability, international co-operation in the field of nuclear energy, peaceful uses of nuclear energy and the development of nuclear fusion science. The atomic energy research and development division oversees the work of JAEA.

2. Advisory bodies

a) Atomic Energy Commission (AEC)

The AEC was established by the Atomic Energy Basic Law, with a view to developing policies on all matters related to the research, development and utilisation of atomic energy (Section 5). The AEC operates under the terms of its own legislation, the Law for the Establishment of the Atomic Energy Commission (the "Establishment Law", No. 188, 19 December 1955).

Although its functions are advisory, it is a powerful body which can make recommendations on its own initiative, through the Prime Minister or to other ministries and agencies involved in regulating the use of nuclear energy. These ministries and agencies are also obliged to consult with the AEC in the course of carrying out their own licensing and other regulatory activities.

The main task of the AEC is to consider and make recommendations on the following matters:

- policies on the utilisation of atomic energy;
- co-ordination between different government agencies involved in regulating nuclear activities;
- the content of regulations dealing with nuclear fuel and nuclear reactors (apart from safety issues);
- promotion of nuclear energy research;
- policies on training of professional and technical staff working in the field of nuclear energy; and

- collection of data, preparation of statistics and research on the use of nuclear energy.

The AEC, which was placed under the auspices of the Cabinet Office during the reorganisation of the government in 2001, consists of a chairperson and four commissioners, who are appointed by the Prime Minister for a period of three years. A commissioner's appointment may be renewed following approval by the Diet (Japanese Parliament).

b) Nuclear Safety Commission (NSC)

The NSC came into existence in 1978 as a result of a decision that nuclear safety issues should no longer be dealt with by the AEC (which was also responsible for the promotion of nuclear energy), but by an independent body, so as to institute a clear separation of responsibility between the development and use of nuclear energy and nuclear safety and health protection. This separation was carried out by an amendment to the Atomic Energy Basic Law (No. 186, 19 December 1955) and the Law for the Establishment of the Atomic Energy Commission (No. 188, 19 December 1955).

In the wake of the Tokai-mura criticality accident in 1999, the Secretariat of the NSC was transferred on 1 April 2000 from the Science and Technology Agency (STA) to the Prime Minister's Office (now the Cabinet Office), following a governmental decision stating that the NSC should strengthen its independence, enhance the secretariat and recruit experts on nuclear safety. Its functions are:

- to define regulatory policies for the safe utilisation of nuclear energy;
- to issue guidelines for the safety of nuclear fuel, source material and nuclear reactors;
- to issue guidelines on the prevention of ionising radiation hazards resulting from the use of nuclear energy and radioactive fallout; and
- to make recommendations on any other aspects of radiation safety as it considers appropriate.

Licensing authorities are obliged to consult the NSC on safety and radiation protection issues in the course of their licensing procedures. The NSC must confirm subsequent regulation performed by the administrative authorities.

The NSC consists of a chairperson and four commissioners, appointed by the Prime Minister with the approval of the Diet for a period of three years. A commissioner's term of office may be renewed following approval by the Diet.

A number of advisory committees are attached to the NSC to provide expert assistance to the Commission, the most important of these being the Committee on Examination of Reactor Safety and the Committee on Examination of Nuclear Fuel Safety. Other committees include the Special Committees on Nuclear Safety Standards, Nuclear Safety Research, Comprehensive Nuclear Safety, on Basic Prevention against Radiation Hazards, Investigation of Nuclear Accidents and Failures, and Nuclear Disasters.

c) Radiation Council

The Radiation Council is a specialised body placed under the authority of MEXT which is governed by the Law concerning Technical Standards of Radiation Protection (No. 162, 21 May 1958).

The principal function of the Council is to establish technical standards for radiation protection and measurement of radioactivity levels (Section 5).

The Council has a maximum of 20 members, appointed by MEXT. Members are appointed on the basis of relevant specialist knowledge, and may be either from within or outside government

agencies. They hold office on a part-time basis for a period of two years unless they belong to government agencies (Section 7).

The Nuclear Safety Division of MEXT provides administrative support to the Council.

d) Special Committee on Energy Policy

This Committee of the House of Counsellors was set up by the Diet in 1979 to study Japan's long-term energy policy and to submit proposals and draft legislation giving effect to these proposals to the government. The Committee is assisted in this task by specialists in the field.

The Committee is made up of 21 members of the Diet, appointed for a period of 6 years.

e) Other advisory bodies

METI consults several committees for advice in the course of the process of licensing commercial nuclear power reactors. In particular, it seeks the advice of the Advisory Committee on Environmental Matters and some of the members of the Nuclear and Industrial Safety Subcommittee under the Advisory Committee for Natural Resources and Energy. METI also consults the Electric Power Development Committee of the Advisory Committee for Natural Resources and Energy, whose approval must be obtained before any application to build and operate a commercial reactor is granted.

3. Public and Semi-Public Agencies

a) Japan Atomic Energy Agency (JAEA)

The Japan Atomic Energy Agency was created through the merger of the two major national nuclear R&D organisations, Japan Atomic Energy Research Institute (JAERI) and Japan Nuclear Cycle Development Institute (JNC). All the rights and obligations of both JNC and JAERI have been taken over by the JAEA, except for a portion of JAERI's activities which have been taken over by RIKEN (a research institute in the field of science and technology) and specific activities of JAERI – not deemed necessary for the fulfilment of the objectives of the JAEA – which have been transferred to the government.

i) Legal Status

The 2004 Japan Atomic Energy Agency Law establishes the title, mission, and tasks of the JAEA.

The JAEA operates as an independent administrative institution, i.e. a public organisation with a certain level of autonomous decision making authority. The JAEA is therefore subject to the general law establishing the principles applicable to all independent administrative institutions as well as to the Japan Atomic Energy Agency Law.

The medium-term objective of the JAEA is adopted by the Minister of Education, Culture, Sports, Science and Technology (MEXT) and the Minister of Economy, Trade and Industry (METI). In accordance with this objective, the JAEA shall establish its medium-term plan and submit it to the Ministers – MEXT and METI – for approval along with its annual programme of work. The JAEA is subject to strict evaluation by a committee set up within MEXT for this purpose.

ii) Responsibilities

The main responsibilities of the JAEA are:

- basic research on nuclear energy;
- activities necessary to ensure the technical feasibility of nuclear fuel cycle activities (development of the fast breeder reactor and related research, development of nuclear

fuel materials for the fast breeder reactor and related research, development of technology for reprocessing of nuclear fuel materials and related research and development of technology for the treatment and the disposal of high-level radioactive waste);

- dissemination of information acquired from the above activities and the promotion of its utilisation;
- encouraging the use of its facilities and equipment by those involved in the development and utilisation of nuclear energy and, more broadly, those who undertake research and development on science and technology;
- contribution to human development in the nuclear field and to improving expertise amongst nuclear scientists and engineers; and
- collection, categorisation and dissemination of information concerning nuclear energy.

iii) Structure

The President of the JAEA is appointed by the Minister of Education, Culture, Sports, Science and Technology in consultation with the Atomic Energy Commission. One vice-president and up to seven executive directors may be appointed to support the president in the completion of his tasks.

iv) Financing

The JAEA is financed for a large part by the government (about 80% of the JAEA's annual budget) and, to a minor extent, by the private sector.

ORGANISATION FOR ECONOMIC CO-OPERATION AND DEVELOPMENT

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NUCLEAR ENERGY AGENCY

The OECD Nuclear Energy Agency (NEA) was established on 1st February 1958 under the name of the OEEC European Nuclear Energy Agency. It received its present designation on 20th April 1972, when Japan became its first non-European full member. NEA membership today consists of 29 OECD member countries: Australia, Austria, Belgium, Canada, the Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Japan, Luxembourg, Mexico, the Netherlands, Norway, Poland, Portugal, Republic of Korea, the Slovak Republic, Spain, Sweden, Switzerland, Turkey, the United Kingdom and the United States. The Commission takes part in the work of the Agency.

The mission of the NEA is:

- to assist its member countries in maintaining and further developing, through international co-operation, the scientific, technological and legal bases required for a safe, environmentally friendly and economical use of nuclear energy for peaceful purposes, as well as
- to provide authoritative assessments and to forge common understandings on key issues, as input to government decisions on nuclear energy policy and to broader OECD policy analyses in areas such as energy and sustainable development.

Specific areas of competence of the NEA include safety and regulation of nuclear activities, radioactive waste management, radiological protection, nuclear science, economic and technical analyses of the nuclear fuel cycle, nuclear law and liability, and public information.

The NEA Data Bank provides nuclear data and computer programme services for participating countries. In these and related tasks, the NEA works in close collaboration with the International Atomic Energy Agency in Vienna, with which it has a Co-operation Agreement, as well as with other international organisations in the nuclear field.

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