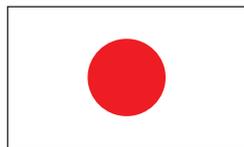


# **N**uclear Legislation in **OECD and NEA Countries**

Regulatory and Institutional  
Framework for Nuclear Activities



**Japan**



# Japan

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## I. General Regulatory Regime

### 1. Introduction

As of the January 2017, Japan has 51 nuclear reactors (27 BWRs and 24 PWRs) (including 3 reactors under construction) in total. Following the Fukushima Daiichi nuclear power plant (NPP) accident, operators decided not to resume operation of 6 reactors among the 48 reactors.<sup>1</sup> In addition, 3 reactors are under decommissioning and 6 reactors (all the units at Fukushima Daiichi NPP) are in permanent shut down for decommissioning. Japan has 1 prototype fast breeder reactor in long-term shutdown, 1 advanced thermal reactor under decommissioning and 14 research reactors in operation while 8 research reactors are under decommissioning. Japan also has 2 spent fuel reprocessing facilities (1 under construction), 7 nuclear fuel fabrication and enrichment facilities, 1 spent fuel interim storage facility (under construction), 2 waste disposal facilities and 2 storage facilities of radioactive waste.

The starting point of Japan's nuclear legislation is the Atomic Energy Basic Act.<sup>2</sup> The Basic Act 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 Act created the Nuclear Regulation Authority (NRA) (Chapter 1-2) and the Atomic Energy Commission (AEC) (Chapter 2). 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 development of nuclear source materials (Chapter 9). These provisions, in effect, 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 Act for the Establishment of the Nuclear Regulation Authority;<sup>3</sup>
- the Act on the Regulation of Nuclear Source Material, Nuclear Fuel Material and Reactors;<sup>4</sup>
- the Act on Prevention of Hazards due to Radioisotopes etc.;<sup>5</sup>
- the Act on Special Measures Concerning Nuclear Emergency Preparedness;<sup>6</sup> and
- the Act on Compensation for Nuclear Damage.<sup>7</sup>

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1. Those reactors are Tsuruga 1, Mihama 1 and 2, Shimane 1, Genkai 1 and Ikata 1.

2. Atomic Energy Basic Act, No. 186, 19 December 1955, as amended (Basic Act).

3. Act for the Establishment of the Nuclear Regulation Authority, No. 47, 27 June 2012, as amended (NRA Establishment Act).

4. Act on the Regulation of Nuclear Source Material, Nuclear Fuel Material and Reactors, No. 166, 10 June 1957, as amended (Reactor Regulation Act).

5. Act on Prevention of Hazards due to Radioisotopes etc., No. 167, 10 June 1957, as amended (Radiation Hazards Prevention Act).

6. Act on Special Measures Concerning Nuclear Emergency Preparedness, No. 156, 17 December 1999, as amended (Nuclear Emergency Act).

The NRA Establishment Act came into effect on 19 September 2012. It establishes the NRA as the nuclear regulator and provides details on its competencies and responsibilities. This Act stresses the importance of independently exercising regulatory authority with a neutral and fair attitude, in an integrated manner. The Act also stipulates the NRA's organisational structure; appointment procedure for the Chairman and Commissioners; reporting responsibility to the Diet (Japanese Parliament); rules for the disclosure of information; procedure for the formulation of regulations; and other functions and responsibilities necessary for accomplishing the NRA's missions.

The Compensation Act was promulgated on 17 June 1961. The purpose of this Act is to protect persons suffering from nuclear damage and to contribute to the sound development of the nuclear industry. This Act provides for the strict, exclusive and unlimited liability of the operator of a nuclear installation and prohibits the operation of the installation if the required financial security is not in place. In addition, this Act also provides the government support when the amount of compensation to be paid for nuclear damage exceeds the amount of the operator's financial security.

## **2. Mining regime**

The Basic Act states that special provisions dealing with the mining of nuclear source material may be established by subsequent laws (Article 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 (Articles 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 and equipment**

Activities involving radioactive substances are governed by the Radiation Hazards Prevention Act.

The principal focus of the Radiation Hazards Prevention Act is radiological protection and to this end it regulates the use, sale, lease, waste management, 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 NRA (Article 3). The application must contain information about the intended use, location, radiation safety measures to be observed, etc. The NRA may attach conditions to the licence (Article 8) and may suspend or cancel it if there is non-compliance with the Act or any condition thereof. The sale of radioisotopes is subject to licensing conditions similar to those regarding their use (Article 4). The use of radioactive sources containing radioisotopes below the prescribed level of radioactivity or radioactive concentration consistent with the International Atomic Energy Agency (IAEA) Basic Safety Standard (BSS) exemption level is not subject to regulation (Article 3). The

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7. Act on Compensation for Nuclear Damage, No. 147, 17 June 1961, as amended (Compensation Act).

Radiation Hazards Prevention Act also contains criminal sanctions (fines and imprisonment) for non-compliance with its provisions (Chapter VII).

#### 4. Nuclear installations

##### a) Reactor Regulation

The Reactor Regulation Act, promulgated in 1957, provides comprehensive regulations for the use of nuclear energy. In response to the accident at the Fukushima Daiichi NPP, the Reactor Regulation Act was revised by the Supplementary Provisions of the Act for Establishment of the Nuclear Regulation Authority (June 2012) to introduce new regulations based on “lessons learnt” and the availability of the latest technical knowledge, as well as international regulatory trends, including regulatory requirements specified by international organisations such as the International Atomic Energy Agency (IAEA). The main points of the revision include: (1) strengthening countermeasures against severe accidents, (2) adoption of the latest technical knowledge and introduction of the backfit system under which previously authorised nuclear facilities are also required to conform to new regulatory requirements, (3) introduction of an approval system for the extension of operational periods and (4) integration of all safety regulations on power reactors into the Reactor Regulation Act.

This Act provides necessary regulations on refining activities, fabricating and enrichment activities, interim storage activities, reprocessing activities and waste disposal, use of nuclear fuel materials, etc. as well as on the installation and operation, etc. of reactors.

Through these regulations, this Act ensures that the uses of nuclear source material, nuclear fuel material and reactors are limited to peaceful ones; prevents hazards caused by nuclear source material, nuclear fuel material and reactors, such as a severe accident at a nuclear facility resulting in a discharge of an abnormal level of radioactive materials outside the facility or place of activity where said nuclear facility is installed; protects nuclear fuel material; and implements international agreements, thereby contributing to protecting people’s lives, health, and property, preserving the environment and ensuring national security.

The Reactor Regulation Act consists of the following chapters:

1. General Provisions
2. Regulations Concerning Refining Activities
3. Regulations Concerning Fabricating and Enrichment Activities
4. Regulations Concerning the Installation, Operation, etc. of Reactors
  - Regulations Concerning the Installation, Operation, etc. of Research and Test Reactors
  - Regulations Concerning the Installation, Operation, etc. of Power Reactors
- 4-2. Regulations Concerning Interim Storage Activities
5. Regulations Concerning Reprocessing Activity
  - 5-2. Regulations Concerning the Activities of Radioactive Waste Disposal and Storage
  - 5-3. Regulations Concerning the Use, etc. of Nuclear Fuel Material, etc.

- 5-4. Responsibility of Licensees of Nuclear Energy Activity, etc.
6. Regulations, etc. Concerning Licensees of Nuclear Energy Activity, etc.
  - 6-2. Regulations, etc. Concerning the Use, etc. of Internationally Controlled Material
7. Miscellaneous Provision
8. Penal Provision
9. Release, etc. of Foreign Vessels Subject to Security Money, etc.

The Reactor Regulation Act requires, *inter alia*, that any person who intends to carry out refining activities shall obtain an authorisation from the NRA (Article 3). Applications for an authorisation must contain information on the planned design, proposed safety measures and the intended construction and refining methods for the facility. Licensees are required to keep records of their operations as prescribed by order of the NRA (Article 11).

For regulations related to specific facilities and activities, this Act provides requirements for each step of the development process. For example, with regard to power reactors, authorisations are required for the following steps: installation (permission for construction), plan for construction work, pre-service inspections, periodic facility inspection and the operational safety programme.

The Act also establishes a whistleblower system for the employees of the licensee, etc., (excluding operators of a foreign, civilian nuclear vessel). It is stipulated that the licensee shall not dismiss an employee or give an employee other disparate treatment due to the employee having made an allegation.

At the international level, Japan accepted the Convention on Nuclear Safety<sup>8</sup> on 12 May 1995.

### ***b) Emergency response***

The objectives of the Nuclear Emergency Act are to prevent loss of life and personal injury and to protect personal property from nuclear disaster by strengthening response measures for nuclear emergencies. To this end, this Act stipulates the responsibility of nuclear operators, procedure of declaring a nuclear emergency, establishment of the Nuclear Emergency Response Headquarters and implementation of emergency response or other measures related to addressing a nuclear emergency. This Act stipulates that nuclear operators are responsible for implementing all possible measures for preventing nuclear emergencies and for implementing measures necessary for preventing the progression and mitigation of nuclear emergencies.

This Act also stipulates that the state has the responsibility to implement the necessary actions for emergency response and the necessary actions for emergency preparedness, as well as the measures for restoration after nuclear emergencies.

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8. Convention on Nuclear Safety (1994), IAEA Doc. INFCIRC/449, 1963 UNTS 293, entered into force 24 October 1996 (CNS).

On 19 September 2012, this Act was revised on the basis of the lessons learnt from the accident at the Fukushima Daiichi NPP to strengthen nuclear emergency preparedness, the function of the Nuclear Emergency Response Headquarters during a nuclear emergency and the NRA Emergency Preparedness and Response Guide.

When nuclear operators notify the NRA of events that correspond to a site area emergency, the NRA confirms the situation and immediately provides the Prime Minister with information on the status of the events, a proposed announcement on what needs to be communicated to residents in the areas, and proposed instructions on emergency response actions, such as evacuation and sheltering-in-place. Then state and local governments set up emergency response system.

If a nuclear emergency situation is declared, the Nuclear Emergency Response Headquarters will be set up. The Prime Minister will serve as the chief of the Headquarters. The Nuclear Emergency Response Headquarters will develop a policy for the implementation of emergency responses actions and the post-nuclear emergency actions.

At the international level, Japan became a party to both the Convention on Early Notification of a Nuclear Accident<sup>9</sup> and the Convention on Assistance in the Case of a Nuclear Accident or Radiological Emergency<sup>10</sup> on 9 June 1987.

## 5. Trade in nuclear materials and equipment

While Japan imports nuclear fuels, materials and technology, it also has a domestic nuclear industry that supplies numerous nuclear and nuclear-related services and equipment.

Japan has a clearly defined nuclear export policy based on the assurance of peaceful uses and non-proliferation, which includes 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 Act (Article 2).

The Reactor Regulation Act provides for the control of nuclear material and equipment while the Radiation Hazards Prevention Act regulates the sale of radioisotopes.

The Reactor Regulation Act restricts the transfer, import and export of nuclear fuel to licensees for: refining, fabricating or enrichment, or reprocessing such material; construction of nuclear reactors; and the use of nuclear fuel material (Article 61). These

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9. Convention on Early Notification of a Nuclear Accident (1986), IAEA Doc. INFCIRC/335, 1439 UNTS 276, entered into force 27 October 1986 (Early Notification Convention).

10. Convention on Assistance in the Case of a Nuclear Accident or Radiological Emergency (1986), IAEA Doc. INFCIRC/336, 1457 UNTS 134, entered into force 26 February 1987 (Assistance Convention).

restrictions do not apply where the government receives or transfers nuclear fuel at the national level or in accordance with international arrangements.

The manufacturing, distribution and import of radioactive drugs are regulated by the Act on Securing Quality, Efficacy and Safety of Products including Pharmaceuticals and Medical Devices<sup>11</sup> and are subject to licensing requirements.

The import and export of nuclear materials and equipment are also subject to the provisions of general trade acts, namely the Foreign Exchange and Foreign Trade Act<sup>12</sup> and its implementing orders and regulations that describe the procedures for obtaining import and export licences and approvals. The Ministry of Economy, Trade and Industry (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 import. The Import Trade Control Order<sup>13</sup> and the Export Trade Control Order<sup>14</sup> 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<sup>15</sup> and the Export Trade Control Regulations.<sup>16</sup>

## 6. Radiological protection

The Radiation Hazards Prevention Act governs radiological protection issues.

The aim of the Radiation Hazards Prevention Act is to regulate the use, sale, lease, waste management or any other handling of radioisotopes and ionising radiation-generating equipment in order to prevent ionising radiation hazards and to secure public safety (Article 1). Pursuant to this Act, applications must be submitted to the NRA 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's Office<sup>17</sup> and whether potential hazards from ionising radiation have been dealt with satisfactorily (Articles 6, 7 and 7-2). The Radiation Hazards Prevention Act also sets out dose limits for exposure to ionising radiation. The limit is 50 mSv per year for workers whose work involves radiation activities<sup>18</sup> and 1 mSv per year for members of the public. In 1980, the Radiation Hazards Prevention Act was amended to introduce a system of inspection and approval of radioisotopic equipment and to prescribe compulsory training courses for radiological protection supervisors. The amendments also established a training institution to conduct these courses. In 1995, further amendments established a system

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11. No. 145, 1960, as amended.

12. No. 228, 1 December 1949, as amended.

13. Cabinet Order No. 414, 29 December 1949, as amended.

14. Cabinet Order No. 378, 1 December 1949, as amended.

15. Ministry of International Trade and Industry (MITI) Ordinance No. 77, 29 December 1949, as amended.

16. MITI Ordinance No. 64, 1 December 1949, as amended.

17. No. 56, 30 September 1960, as amended

18. 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.

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 in 2004. In addition, the Regulations on the Prevention of Ionising Radiation Hazards<sup>19</sup> are established for the purpose of radiological protection for radiation workers.

## 7. Radioactive waste management

The legislation applicable to the management of radioactive waste resulting from nuclear reactor operations is the Reactor Regulation Act. In relation to waste resulting from the use of radioisotopes and ionising radiation-emitting equipment, the Radiation Hazards Prevention Act is applicable. Furthermore, the Act on Final Disposal of High-Level Radioactive Waste<sup>20</sup> governs the geological disposal of such waste.

Pursuant to Chapter V-2 of the Reactor Regulation Act, an application may be submitted to the NRA for a licence to engage in nuclear waste disposal activities (Article 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 radioactive waste and its properties, the location, structure and equipment of the proposed storage or disposal facilities and construction 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. Once the licence has been granted, the operator of the waste management facility is subject to supervision and inspection by the NRA at regular intervals (Articles 51-6 and 51-8 to 51-10).

Regarding high-level radioactive waste, the Nuclear Waste Management Organisation (NUMO) was established as a private law company pursuant to the Act on Final Disposal of High-Level Radioactive Waste (Article 40). 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 high-level 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 METI, to this Organisation every year.

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 (Article 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 (Article 7). Finally, the Organisation shall select a site where the final disposal facilities are to be constructed (Article 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 the local government where the site is located.

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19. Ordinance of the Ministry of Labour, No. 41, 30 September 1972, as amended.

20. No. 117, 31 May 2000, as amended.

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

The Radiation Hazards Prevention Act has a series of provisions dealing with the obligations of those responsible for the waste management of radioisotopes and material contaminated by radioisotopes (Article 19). Measures to prevent ionising radiation hazards must be taken, in accordance with the technical standards stipulated in the NRA ordinances. Failure to comply with these standards may result in the NRA ordering the suspension of the waste management activities. Records must be kept of waste management activities and of the results of monitoring radiation levels at waste management and disposal facilities. Further provisions require that all waste management operators develop their own internal programmes for the prevention of radiation hazards, that these rules be notified to the NRA, and that training and medical examinations be made available to all employees entering waste storage, predisposal 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<sup>21</sup> since 15 October 1980. Although the Convention permitted the dumping at sea of certain low-level radioactive wastes, the dumping of such wastes at sea has been prohibited in Japan since the adoption of the resolutions at the meetings of the contracting parties in the early 1980s calling for the suspension of dumping of radioactive wastes. The amendment to the Annex of the Convention to ban any dumping of radioactive materials at sea for 25 years came into effect for Japan in early 1994 and the 1996 Protocol to the Convention<sup>22</sup> came into effect for Japan in November 2007.

At the international level, Japan became a party to the Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management<sup>23</sup> on 26 August 2003.

## 8. Nuclear safeguards and nuclear security

Provisions regarding the peaceful use of nuclear materials are established in the Basic Act and the Reactor Regulation Act. The Basic Act states that research, development and utilisation of nuclear energy shall be limited to peaceful purposes (Article 2) and provides, *inter alia*, that the import, export, possession, etc. of nuclear fuel material shall be subject to regulations for control purposes (Article 12). The Reactor Regulation Act lays down detailed regulations for the different types of nuclear activities, including provisions for accounting for and control of international controlled material (Chapter VI-2). The Reactor Regulation Act 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 Safeguards Agreement

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21. Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter (1972), 1046 UNTS 120, entered into force 30 August 1975 (London Convention).

22. 1996 Protocol to the Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter, 1972 (1996), entered into force 24 March 2006 (London Protocol).

23. Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management (1997), IAEA Doc. INFCIRC/546, 2153 UNTS 357, entered into force 18 June 2001 (Joint Convention).

concluded with the IAEA and other agreements concluded with foreign governments or international organisations, except for the Additional Protocol to the Safeguards Agreement, in relation to research, development and use of nuclear energy (Article 2).

The NRA is responsible for the regulations implementing safeguards based on international commitments and other regulations for ensuring the peaceful uses of nuclear energy. The Safeguards Office within the Radiation Protection Department is in charge of safeguards. Safeguards inspections are carried out by the NRA as well as the organisation implementing safeguards inspections designated by the NRA, in accordance with the Reactor Regulation Act. The NRA and the NRA-designated organisation have access to the offices, facilities and places where international controlled material is located to carry out safeguards inspections. If premises contain international controlled material, persons appointed by the IAEA or the supplier state also have inspection powers. Japan accepted to apply IAEA safeguards to nuclear material in conformity with its obligations under the Nuclear Non-proliferation Treaty.<sup>24</sup> On 16 June 1999, new provisions were added to the Reactor Regulation Act to incorporate the requirements of the Additional Protocol to the Safeguards Agreement, which Japan signed within the IAEA framework in 1998.

The NRA issues ordinances laying down a framework for physical protection in relation to all nuclear facilities, and the Ministry of Land, Infrastructure, Transport and Tourism (MLIT) is responsible for nuclear transport. The Reactor Regulation Act provides that operators of any of the nuclear activities to which it applies (refining, fabricating and enrichment, interim storage, reactor operation and installation, storage of spent fuel, reprocessing, waste disposal and use of nuclear fuel material) are responsible for establishing security plans for the physical protection of specified nuclear materials in their establishments. These security plans must conform to the requirements specified in various NRA ordinances.

The security plan established by an operator of nuclear installations can only be modified with the approval of the NRA (which also has the power to order that certain modifications be made). Implementation of the security plan is checked periodically by NRA inspectors. The operator must appoint a physical protection manager to ensure compliance with the plan.

The NRA has been strengthening the regulatory framework on physical protection by amending relevant ordinances from time to time. Such amendments were made in order to reflect the lessons learnt from the Fukushima Daiichi accident in 2011, as well as measures recommended in the IAEA Nuclear Security Series No. 13, also known as INFCIRC/225/Rev.5.<sup>25</sup> The latest amendment was made in September 2016 to introduce measures against insider threats, including a trustworthiness check system.

The Act on Punishment of Acts to Endanger Human Lives by Generating Radiation<sup>26</sup> establishes criminal offences for acts that threaten human lives, etc. by generating

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24. Treaty on the Non-Proliferation of Nuclear Weapons (1968), IAEA Doc. INFCIRC/140, 729 UNTS 169, entered into force 5 March 1970 (NPT).

25. IAEA (2011), "Nuclear Security Recommendations on Physical Protection of Nuclear Material and Nuclear Facilities", IAEA Doc. INFCIRC/225/Revision 5, IAEA Nuclear Security Series No. 13.

26. No. 38, 11 May 2007, as amended.

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,<sup>27</sup> which Japan accepted on 3 August 2007. In addition, in April 2014, the Act was amended in order to ensure the national implementation of the Amendment to the Convention on the Physical Protection of Nuclear Material.<sup>28</sup>

Japan is a party to the Convention on the Physical Protection of Nuclear Material since 28 October 1988<sup>29</sup> and it has accepted the ACPPNM on 24 June 2014.

## 9. Transport

The administrative requirements and safety standards applicable to the transport of radioactive materials in Japan are set out in ordinances by the NRA and the MLIT, which incorporate the 2012 edition of the IAEA Regulations for the Safe Transport of Radioactive Material 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 the NRA and MLIT pursuant to the Reactor Regulation Act (for nuclear materials) and the Radiation Hazards Prevention Act (for radioisotopes). Such transport operations are supervised by the NRA and MLIT to ensure that technical standards are met. The procedure is as follows:

- 1) The NRA 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.
- 2) If the NRA 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 a packaging approval certificate.
- 3) Prior to each transport operation, the applicant also applies to the NRA and MLIT to have the packages approved. Having confirmed that they are in conformity with steps (1) and (2) above and that they meet standards regarding the appearance of the packages, surface contamination, dose equivalent rate and leakage, the certificate of confirmation is issued.

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27. International Convention for the Suppression of Acts of Nuclear Terrorism (2005), 2445 UNTS 137, entered into force 7 July 2007 (Nuclear Terrorism Convention).

28. Amendment to the Convention on the Physical Protection of Nuclear Material (2005), IAEA Doc. INFIRC/274/Rev.1/Mod.1, entered into force 8 May 2016 (ACPPNM).

29. Convention on the Physical Protection of Nuclear Material, (1980), IAEA Doc. INFIRC/274 Rev. 1, 1456 UNTS 125, entered into force 8 February 1987 (CPPNM).

- 4) Prior to each transport operation, the applicant again applies to the 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 MLIT 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, in general, the same procedure applicable to transport by rail and road is followed, except that the competent bodies are the MLIT and the Japan Coast Guard. The applicable legislation is the Ship Safety Act,<sup>30</sup> 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 Organization's (IMO) International Convention for the Safety of Life at Sea (SOLAS)<sup>31</sup> concerning the structure and equipment of the ship. In the case of combined land and maritime transport, packages are approved by the NRA and MLIT on the basis of the Reactor Regulation Act (or the Radiation Hazards Prevention Act, for radioisotopes). This approval procedure is sufficient to satisfy the conditions of the Ship Safety Act. 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 the MLIT. The applicable legislation is the Civil Aeronautic Act.<sup>32</sup> In the case of combined land and air transport, packages are approved by the NRA or MLIT on the basis of the Reactor Regulation Act (or the Radiation Hazards Prevention Act, for radioisotopes), which is sufficient to satisfy the conditions of the Civil Aeronautic Act.

## 10. Nuclear third party liability<sup>33</sup>

Japan concluded the Convention on Supplementary Compensation for Nuclear Damage (CSC)<sup>34</sup> in January 2015. As a result of Japan's conclusion, the CSC entered into force on 15 April 2015. Japan has established a national regime dealing with compensation for nuclear damage that incorporates a number of the principles embodied in the CSC and other international third party liability regimes. The four major legislative instruments to be considered in this context are the:

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30. No. 11, 15 March 1933, as amended.

31. International Convention for the Safety of Life at Sea (1974), 1184 UNTS 2, entered into force 25 May 1980.

32. No. 231, 15 July 1952, as amended.

33. This section will not address Japan's implementation of the national nuclear third party liability regime following the Fukushima Daiichi NPP accident. More information on this subject can be found in NEA (2012), *Japan's Compensation System for Nuclear Damage: As Related to the TEPCO Fukushima Daiichi Nuclear Accident*, NEA, Paris.

34. Convention on Supplementary Compensation for Nuclear Damage (1997), IAEA Doc. INFCIRC/567, 36 ILM 1473, entered into force 15 April 2015 (CSC).

- Compensation Act;
- Order for the Execution of the Act on Compensation for Nuclear Damage;<sup>35</sup>
- Act on Indemnity Agreements for Compensation for Nuclear Damage;<sup>36</sup> and
- Order for the Execution of the Act on Indemnity Agreements for Compensation for Nuclear Damage.<sup>37</sup>

The Compensation Act provides for the strict, exclusive and unlimited liability of the operator of a nuclear installation (Articles 3 and 4) for any nuclear damage resulting from the operation of its installation (Article 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 (Article 2). The Compensation Act requires each installation to be insured for a prescribed amount (JPY 120 billion per site for nuclear reactors) (Article 7) and prohibits the operation of the installation if the required financial security is not in place (Article 6).

In addition to the funds available from the operator's insurance, the Indemnity Agreements Act 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 nuclear damage not covered 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 agreement.

Finally, the Compensation Act also provides for the possibility of government support, under certain conditions, where the cost of nuclear damage exceeds the amount of the operator's financial security (Article 16(1)).

According to Article 3 of the Compensation Act, the operator is exonerated from liability for damage caused by a "grave natural disaster of an exceptional character or by an insurrection". The Act therefore distinguishes between grave natural disasters of an exceptional character (exonerated) and those that are not of an exceptional character. Where the exoneration in Article 3 applies, Article 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 Article 724 of the Civil Code,<sup>38</sup> 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.

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35. Cabinet Order No. 44, 6 March 1962, as amended.

36. No. 148, 17 June 1961, as amended (Indemnity Agreements Act).

37. Cabinet Order No. 45, 6 March 1962, as amended.

38. No. 89, 27 April 1896, as amended.

The Compensation Act provides for the possibility of referring a claim to a Dispute Reconciliation Committee for Nuclear Damage Compensation in the event of accidents, which shall be in charge of the mediation of disputes concerning compensation and prepare general instructions to help the operator reach a voluntary settlement of such disputes (Article 18).

Pursuant to a 1994 amendment of the Compensation Act, nuclear damage that occurs due to the operation of a nuclear installation (including fuel fabrication and enrichment facilities, spent fuel reprocessing plants, etc.) is outside the scope of the Product Liability Act.<sup>39</sup> This distinction was required because the Compensation Act provides for the exclusive liability of the nuclear operator, whereas within the meaning of the Product Liability Act, not only the nuclear operator but also a supplier of a nuclear reactor or nuclear fuel material could be liable as a “producer etc”.

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39. No. 85, 1 July 1994, as amended.

## II. Institutional Framework

### 1. Regulatory and supervisory authorities

Before the Fukushima Daiichi accident, the Nuclear and Industrial Safety Agency (NISA), which regulated nuclear facilities and activities, had been a subordinate organisation of the Ministry of Economy, Trade and Industry (METI), which promotes the utilisation of nuclear energy. After the Fukushima Daiichi accident, the lack of independence of the regulatory authority was cited as one of the causes of the accident. For this reason, combined with other lessons learnt, the government separated the safety regulation department from METI. It established the Nuclear Regulation Authority (NRA) as a new regulatory body and incorporated the regulations on the use of nuclear energy and radiation administered by other ministries to the NRA. The NRA Establishment Act clearly states that the NRA independently performs its duties from a neutral and fair standpoint based on its expertise. The following are the main bodies relating to the use of nuclear energy and radiation.

#### a) Cabinet Office

The Basic Act 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 (Article 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, see *infra* under Section 2 "Advisory bodies"). The NSC was abolished following the establishment of the NRA in 2012.

Within the Cabinet Office, the Nuclear Emergency Preparedness Council (NEPC) has been set up as the permanent organisation promoting nuclear emergency preparedness and response measures, even in normal circumstances. One of its principal roles is to approve, under the responsibility of the national government, the local emergency preparedness and response plans, as well as the effectiveness of the plan's commitment by relevant central and local governments. The Prime Minister is assigned as the Chairperson, while the Chief Cabinet Secretary, Minister of the Environment, Minister of State for Nuclear Emergency Preparedness and the NRA Chairman are assigned as Vice-Chairmen. All of the other Ministers and the Deputy Chief Cabinet Secretary for Crisis Management (including related Vice Ministers, Parliamentary Secretaries, etc., if specifically assigned by the Prime Minister) are assigned as Commissioners.

#### b) Nuclear Regulation Authority (NRA)

The NRA is responsible for:

- nuclear safety regulations and safeguards on the use of nuclear energy in accordance with the Reactor Regulation Act;
- safety regulations on the use of radiation in accordance with the Radiation Hazards Prevention Act; and
- nuclear emergency preparedness in accordance with the Nuclear Emergency Act.

The NRA is also responsible for nuclear and radiation security.

The NRA is 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.

***c) Ministry of Economy, Trade and Industry (METI)***

In January 2001, the former Ministry of International Trade and Industry (MITI) was reorganised and METI was established pursuant to the Act for the Establishment of the Ministry of Economy, Trade and Industry.<sup>40</sup> 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 also promotes nuclear energy utilisation, namely milling and refining, nuclear fuel fabrication and enrichment, nuclear power generation, reprocessing and storage of spent nuclear fuel, and disposal of radioactive waste.

***d) The Agency for Natural Resources and Energy (ANRE)***

The Agency for 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, the Nuclear Fuel Cycle Industry Division and Radioactive Waste Management Policy Division. The Nuclear Energy Policy Planning Division administers nuclear energy policy and nuclear energy technology development. 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 Radioactive Waste Management Policy Division is in charge of development, improvement and co-ordination of nuclear radioactive waste management.

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

***e) Ministry of Land, Infrastructure, Transport and Tourism (MLIT)***

The Ministry of Land, Infrastructure, Transport and Tourism (MLIT) is responsible for all forms of transport of radioactive materials. In relation to transport by rail or road, the Reactor Regulation Act and the Radiation Hazards Prevention Act provide that this responsibility is shared with the NRA. Both the Ship Safety Act regulating the transport of radioactive materials by sea and the Civil Aeronautics Act regulating the transport of radioactive materials by air, are administered by MLIT.

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

In January 2001, the Science and Technology Agency (STA) merged with the Ministry of Education, Science and Culture to become the Ministry of Education, Culture, Sports,

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40. No. 99, 16 July 1999, as amended.

Science and Technology (MEXT) pursuant to the Act for the Establishment of the Ministry of Education, Culture, Sports, Science and Technology.<sup>41</sup>

MEXT promotes nuclear energy research and development (R&D) in such areas as fast breeder reactor and nuclear fuel cycle, high-temperature gas-cooled reactors, waste management and decommissioning. MEXT is also promoting measures to help revive communities affected by the Fukushima Daiichi disaster, including compensation for nuclear damage caused by the nuclear accident.

The Nuclear Liability Division within MEXT is in charge of nuclear third party liability. The Atomic Energy Division within MEXT is in charge of promoting R&D in nuclear energy.

## **2. Advisory bodies**

### ***a) Atomic Energy Commission (AEC)***

The AEC was established by the Basic Act, with a view to developing policies on all matters related to the research, development and utilisation of atomic energy (Article 5). The AEC operates under the terms of its own legislation, the Act for the Establishment of the Atomic Energy Commission.<sup>42</sup>

Although its functions are advisory, it is a powerful body that 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 in light of ensuring peaceful use of nuclear energy.

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; and
- collection of data 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 two 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.

### ***b) Reactor Safety Examination Committee***

The Reactor Safety Examination Committee was established based on the NRA Establishment Act (Article 13) and is responsible for matters relating to the safety of nuclear reactors.

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41. No. 96, 16 July 1999, as amended.

42. No. 188, 19 December 1955, as amended (AEC Establishment Act).

### ***c) Nuclear Fuel Safety Examination Committee***

The Nuclear Fuel Safety Examination Committee was established based on the NRA Establishment Act (Article 13) and is responsible for matters relating to the safety of nuclear fuel and associated facilities.

### ***d) Radiation Council***

The Radiation Council was established based on the Act on Technical Standards for Radiation Hazards Prevention<sup>43</sup> and is responsible for matters related to radiation hazards prevention, including the harmonisation of these technical standards through the ministries. The other ministries may consult with this Council if necessary.

### ***e) Other advisory bodies***

In addition to the above advisory bodies, the NRA establishes Study Teams or other committees consisting of NRA Commissioner(s) or staff and external experts to have a broad range of views and expertise in making regulatory criteria or other decisions.

## **3. Public and semi-public agencies**

### ***a) Japan Atomic Energy Agency (JAEA)***

The Japan Atomic Energy Agency (JAEA) Act<sup>44</sup> establishes the title, mission and tasks of the JAEA. The JAEA operates as a national R&D agency.

The main responsibilities of the JAEA are:

- 6) the activity for environmental remediation in Fukushima, and R&D for accelerating the decommissioning of the Fukushima Daiichi NPP with Tokyo Electric Power Company (TEPCO);
- 7) R&D for the establishment of a fast breeder reactor and nuclear fuel cycle for clean and stable energy;
- 8) basic research for using nuclear energy;
- 9) R&D for the treatment and disposal of radioactive waste;
- 10) promotion of international co-operation; and
- 11) promotion of information disclosure and dissemination of R&D results to the public and to contribute to the development of human resources in the field of nuclear energy.

MEXT and/or METI have jurisdiction to supervise the above activities by the JAEA.

The JAEA, as a technical support organisation (TSO), conducts safety research and provides input to regulations. The NRA has jurisdiction to supervise the designated divisions for supporting the NRA activities within the JAEA.

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43. No. 162, 21 May 1958, as amended.

44. No. 155, 3 December 2004, as amended.

### ***b) National Institutes for Quantum and Radiological Science and Technology (QST)***

In April 2016, the National Institute of Radiological Science (NIRS) merged with a part of the JAEA to become the National Institutes for Quantum and Radiological Science and Technology (QST), pursuant to the Act for the National Institutes for Quantum and Radiological Science and Technology.<sup>45</sup> The QST operates as a national R&D agency.

The main responsibilities of the QST are the R&D for: (1) radiology, (2) nuclear fusion for nuclear energy system and (3) quantum beam technology.

The QST, as a TSO, conducts studies and research to support NRA activities. MEXT and the NRA have jurisdiction to supervise the QST.

### ***c) Nuclear Damage Compensation and Decommissioning Facilitation Corporation (NDF)***

The Nuclear Damage Compensation Facilitation Corporation was established in September 2011 so as to ensure that compensation payouts are promptly and appropriately provided, and secure a stable supply of electricity through the granting of compensation funds required by nuclear facility operators, etc., in the event they are faced with a large-scale nuclear damage scenario.

In August 2014, the Nuclear Damage Compensation Facilitation Corporation was reorganised and renamed the Nuclear Damage Compensation and Decommissioning Facilitation Corporation (NDF) to include actions such as support for the decommissioning of the reactors that had caused the accident within the scope of its activities.

The tasks of the NDF are as follows:

- Nuclear Damage Compensation Office: 1) consultation Service, 2) financial assistance and 3) receipt of contributions
- Decommissioning Office: 1) providing technical assistance to deal with key decommissioning challenges, 2) R&D project management and 3) dissemination of information

### ***d) Nuclear Waste Management Organisation (NUMO)***

In accordance with the Act 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 METI. NUMO is responsible for implementation of final geological disposal of HLW and for collection of the fees necessary to fund its disposal activities.

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45. No. 51, 8 July 2015, as amended.