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NUCLEAR LEGISLATION IN OECD COUNTRIES

Regulatory and Institutional Framework for Nuclear Activities

Korea

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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.

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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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KOREA

This chapter was last revised in 1999 and is correct as of that date.

The NEA Secretariat is currently revising this chapter in close consultation with the national authorities and plans to issue a new version in the near future.

KOREA

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I. GENERAL REGULATORY REGIME

1. Introduction

Korea's principal nuclear energy legislation [Framework Act No. 483 of 11 March 1958 on Atomic Energy] dates back to 1958 but has been amended many times. In 1982, a significant revision of the original Act, with a view to consolidating all existing legislation in the nuclear field, was adopted by the Korean Parliament [Act No. 3549 of 1 April 1982]. In 1986, another amendment was made [Act No. 3850 of 12 May 1986], whose main aim was to provide the legal basis for the establishment of a Nuclear Waste Management Fund. In 1995, Act No. 483 was again amended [Act No. 4940 of 5 January 1995], in particular to promote the establishment of an Integrated Nuclear Promotion Plan.* This Plan, to be adopted every five years, defines the future orientations of the utilisation of nuclear energy, including measures in the field of safety [Section 8(2) bis].

A further amendment [Act No. 5233] was made on 30 December 1996. The main provisions of the amendment are as follows:

- the establishment of the Atomic Energy Safety Commission [Section 5];
- the establishment of the Atomic Energy Fund for Research & Development [Section 3(2)];
- the opening of the Public Hearing Procedures [Section 104(5)].

Another amendment [Act No. 5820] introduced on 8 February 1999 provides that the Prime Minister is to assume the role of Chairperson of the Atomic Energy Commission. It also states that technical standards are to be prescribed by ministerial ordinance, and provides for the simplification of certain licensing procedures.

The 1982 amendment laid the foundation for all of Korea's subsequent nuclear legislation, and particularly:

- Presidential Decree No. 10927 of 30 September 1982, as amended in 1989 [Decree No. 12729 of 16 June 1989], which consolidated eleven previous decrees covering all aspects of the peaceful use of nuclear energy; and

* The 16 nuclear power plants currently installed in the Republic of Korea ("Korea") provide 27.7% of the country's total electricity production, or about 12 016 MWe. In addition, Korea has scheduled a major nuclear infrastructure programme to be implemented over the next 15 years: 16 new nuclear units will be built by 2015.

- Ordinance No. 275 of 13 April 1983 of the Prime Minister, also revised [Ordinance No. 356 of 4 January 1990], which implemented the basic 1982 Act and the aforementioned Presidential Decree.

There are also instructions issued by the Minister of Science and Technology, which concern technical standards and operational procedures to be followed by nuclear operators.

The purpose of the 1982 Act, as stated in Section 1, is to help improve the people's welfare and standard of living and to ensure the protection and safety of the public against radiation hazards, by encouraging scientific progress and industrial development of activities related to the production and use of nuclear energy.

From an institutional standpoint, the Minister of Science and Technology is responsible for nuclear safety and regulation. The Minister of Trade, Industry and Energy is in charge of construction and operation of nuclear power plants and nuclear waste disposal facilities.

Also of significance is the Atomic Energy Commission, which was created by the 1958 Act. Its powers and structure have been substantially changed over the years, reflecting the many amendments to the 1958 Framework Act since its adoption. On a general basis, the Commission advises the government on nuclear issues and sets broad guidelines for the peaceful use of nuclear energy in Korea. However, through the amendment introduced by the Act of 30 December 1996, the Commission was divided into two sub-commissions: the Atomic Energy Commission and the Atomic Energy Safety Commission.

Lastly, a large number of specialised bodies contribute actively to the smooth operation of nuclear activities. In this context, the roles of the Korean Atomic Energy Research Institute (KAERI), the Korean Institute of Nuclear Safety (KINS) and the Korean Electric Power Company (KEPCO) are particularly important.

2. Mining Regime

Originally, the 1958 Atomic Energy Act contained a specific provision [Section 17] regarding the mining regime. It stipulated that the regime for mining radioactive ores had to be defined by a separate Act. In 1982, a general Mining Act covering all ores was adopted; in particular Section 3 deals with mining activities related to uranium and thorium. As a consequence, the 1958 Atomic Energy Act as revised contains no provisions dealing with prospecting and mining activities.

3. Radioactive Substances, Nuclear Fuel and Equipment

Procedures for the possession and use of nuclear materials and radioisotopes are set out within the framework of Act No. 3549 of 1 April 1982, as amended in 1995, 1996 and 1999. Additional provisions are contained in Presidential Decree No. 10927 of 30 September 1982 (as amended in 1989 and 1995) and in Ordinance No. 275 of 13 April 1983 (as amended in 1990).

Chapter VI [Section 2] of the amended 1982 Act deals with the use of nuclear materials. According to Section 2 of the Act, the term "nuclear materials" encompasses both nuclear fuel materials and source materials. Two parallel, but separate, procedures are established, depending on the nature of the nuclear materials in question. Thus, the use or possession of nuclear fuel materials

requires a licence [1982 Act, Section 57], whereas source materials need only be reported [Section 64].

Any person intending to possess or use nuclear fuel materials must therefore obtain a licence from the Minister of Science and Technology [Section 57] in accordance with the provisions of the Presidential Decree. Before issuing such a licence, however, the Minister is required to ensure that [Section 58]:

- there shall be no impediments to implementation of the utilisation of nuclear energy;
- the applicant has the technical capability to use and to possess nuclear fuel materials;
- nothing about the site, infrastructure or equipment of the installation concerned or the storage and disposal facilities for nuclear fuels shall preclude preventive measures being taken in the event of a risk of radioactive contamination; and
- the proposed activities do not constitute a danger to human health, property and the environment.

The Minister of Science and Technology may, at any time, revoke a licence or take similar action (such as suspension of the licence, or repair of the installation) if he considers that the requirements of the permit as provided for in Section 58 have not been met, these activities are likely to jeopardise public safety or that they are not in line with the existing technical standards [1982 Act, as amended, Section 62].

Any person planning to use source materials must submit the notification thereof to the Minister of Science and Technology. Plans for their use must satisfy the technical standards set by Presidential Decree No. 10927 of 1982, as amended in 1989 [Act of 1982, as revised, Section 64(1)], and must be approved. If the proposed methods are deemed inappropriate, the above-mentioned Minister may order that they be corrected or that additional measures be taken [Act of 1982, Section 64(3)].

In addition, Decree No. 10927 exempts certain cases:

- Section 172 lists the fuels which, because of their type or quantity, do not require a licence;
- Section 179 exempts from the notification procedure source materials whose radioactivity is less than 0.002 $\mu\text{Ci/g}$ and uranium or thorium used in quantities below 900 grams.

Licensing applications and official notifications must contain detailed information on the applicant's identity and address, the nature and quantity of the substances used or possessed, the purpose and methods for their use, and technical details regarding the location, structure and equipment of the facilities where the substances are to be used. In the case of nuclear fuels, additional information is required on methods of storing or reprocessing spent fuels [Ordinance of the Prime Minister No. 275 of 13 April 1983, as amended in 1990, Section 68 and 75].

The use or sale of radioactive isotopes or radiation-generating devices generally requires a licence from the Minister of Science and Technology [1982 Act, Section 65], which is granted on three conditions [Section 66]:

- that the location and structure of the installation complies with the technical standards established by the 1982 Presidential Decree, as amended in 1989;
- that neither the radioisotopes, the contaminated materials nor the ionising radiation-generating devices pose a threat of radioactive contamination;
- that non-destructive testing by radioisotopes or radiation-generating devices conform not only to the above-mentioned two conditions, but also to the technical standards established by the Presidential Decree.

In addition, the 1982 Act stipulates the grounds for the revocation or suspension of licences [Section 68], its safety conditions [Section 70], the mandatory technical standards [Article 71], etc. The details of these procedures are set out in the 1982 Presidential Decree and the Prime Minister's 1983 Ordinance, both as amended.

With regard to sealed radioisotopic sources or ionising radiation-generating devices, the 1982 Act stipulates that if the quantities or capacities involved are below the limits set by the Prime Minister's Ordinance, their use need only be reported [Section 65].

4. Nuclear Installations

a) Licensing and inspection, including nuclear safety

i) Construction and operation

Chapter IV of Act No. 4940 of 1995, as amended, deals with the regime for the construction and operation of nuclear reactors and related facilities. According to Section 9 of Presidential Decree No. 14797, "related facilities" means:

- nuclear reactor coolant system facilities;
- instrumentation and control system facilities;
- processing and storage facilities for nuclear fuel materials;
- radioactive waste disposal facilities;
- radiation control facilities;
- nuclear reactor containment facilities;
- nuclear reactor safety system facilities;
- other facilities which are concerned with the safety of nuclear reactors as specified by the Minister of Science and Technology.

The construction of a reactor and related facilities requires prior licensing by the Minister of Science and Technology [Section 11]. Applications for construction permits must supply information on the applicant's identity, the chosen site and the intended purposes of the reactor or the installation, as well as technical construction specifications, etc. [Ordinance No. 567 of 1996, Section 2].

Technical files are examined by the Korean Institute for Nuclear Safety (KINS), which in turn submits an evaluation of the construction project to the Minister of Science and Technology. The KINS report must be approved by the Atomic Energy Commission before the Minister of Science and Technology may issue a construction permit [Decree No. 14797 of 1995, Section 22].

Accordingly, construction on any given site may commence only with the Minister's written approval [1995 Act, Section 12]. Furthermore, the Minister is required to ensure that:

- the applicant possesses the technical and professional capability needed to complete the job without danger;
- the chosen site and the installation's structure and equipment comply with the technical standards laid down in Presidential Decree No. 14797 of 1995 so as not to impair the protection of persons and property against ionising radiation;
- the proposed construction involves no danger of environmental pollution; applicants are also required to provide ministerial authorities with an environmental impact study [see Section 4, (b) "Protection of the environment against radiation effects", *infra*].

Lastly, before construction may get underway, the prospective builder must also notify the Minister of Science and Technology of the intended plans and construction methods [1995 Act, Section 14]. Section 8 of the 1996 Ordinance stipulates the minimum requirements.

Grounds for the revocation of a building permit are set out in Section 17 of the 1995 Act. Among them are the discovery of illegalities in the preliminary stages of the application process, unjustified failure to carry out construction work during a period exceeding that established by Presidential Decree No. 14797 of 1995 and, more generally, the violation of standards prescribed by the Framework Act.

The procedure for obtaining an operating licence for a nuclear reactor and related facilities is quite similar to the above-mentioned procedure for the pre-construction phase. While certain conditions – including those relating to the operator's technical and professional capability and to environmental protection – are the same, the prospective operator must supply additional information on the reactor's operating capacity and its compliance with the technical standards specified by Presidential Decree [1995 Act, Section 22].

Any nuclear power plant owner must appoint a person who holds an operator's licence to supervise the reactor's operation [Section 26]. Persons eligible to perform this function must possess an operator's licence attesting to their past experience in another installation and/or a technical training degree. Operators' licences are issued directly by the Ministry of Science and Technology.

The choice of operator is left to the owner's discretion. Notwithstanding, the Minister of Science and Technology may order an operator's removal if it turns out that the person has not fulfilled his duties in an appropriate manner [Section 28(1)]. In such cases, the owner must dismiss the said person and appoint another within 30 days [Section 28(2)].

Inspections must be carried out, both during the pre-operational phase [1995 Decree, Section 27] and after operations have begun [Section 42]. The purpose of such inspections, which are performed by specialised officers of the Ministry of Science and Technology, is to make sure that the operation of a reactor, as well as the safety measures, comply with the technical standards set by current regulations.

The grounds for revoking an operating licence are very similar to the ones for revoking a construction permit [1995 Act, Section 24]. Once an operating licence has been revoked, the reactor owner must surrender any nuclear fuel, ensure that the radioactive contamination caused by the materials used is as low as possible, and dispose of the spent fuel generated during operations [Decree No. 14797 of 1995, Section 40].

Lastly, Ordinance No. 567 of 1996 also deals with situations that require the competent authorities to be notified. These include notification of replacement of the licensee [Section 15], notification of discontinuance of operations [Section 22], notification of decommissioning of reactor [Section 23], etc.

ii) Decommissioning

The 1995 amendment to the Atomic Energy Act contains provisions concerning the safety of decommissioning operations for power reactors and other fuel cycle facilities. Their owners must, in particular, submit in advance a decommissioning plan for approval by the competent authorities.

b) Protection of the environment against radiation effects

The concept of an environmental impact study appears for the first time in the 1982 amendment of the Atomic Energy Framework Act. While Section 11 considers the impact study an essential component of the material to be submitted by applicants for construction permits, full details of such studies are defined by Ordinance No. 567 of 1996.

In the pre-operational phase, detailed information on the installation and the state of its surrounding environment (natural, social and economic) is required [1983 Ordinance, Section 3]. This information includes:

- an evaluation of the environmental impact of the construction and operation of the proposed installation;
- the type of measures to be taken in order to minimise environmental impact, and ecological monitoring systems;
- an estimate of the consequences of an accident on the surrounding area.

Thereafter, operators are required to protect the environment from any dangers that their installations may represent. Accordingly, studies on the state of the environment must be carried out periodically and the results are submitted to the Minister of Science and Technology if there is a real risk of radioactive contamination of the environment. In such a situation, the Minister orders the operator to take all necessary steps to preserve the environment [Decree No. 10927 of 1982, Section 111].

c) Emergency response

Section 98 of the 1995 Act provides the basis for emergency procedures. Accordingly, the operator is required to take the appropriate safety measures without delay in the case of:

- a major risk of a nuclear accident due to an earthquake, fire or any other type of catastrophe;
- failure of nuclear related facilities; or
- a danger of radioactive contamination.

Section 301 of the 1995 Decree suggests the most appropriate emergency measures, depending on the nature of the danger.

Furthermore, in an emergency, the exposure of workers to ionising radiation must be kept to a minimum by reducing the duration of such exposure; exposure thresholds are set by the Minister of Science and Technology. In addition, operators must promptly notify the Minister of Science and Technology of the nature of the accident as well as the safety measures that have been taken. In turn, the Minister may order a suspension of use of certain nuclear equipment, the disposal of radioactive materials, adoption of measures to reduce the effects of contamination or any other preventive measures he considers necessary [1995 Act, Section 98].

Each reactor must be equipped with a series of alarms and monitoring mechanisms, including, *inter alia*, a warning system for operating problems [Decree No. 10927 of 1982, Section 80], an emergency cut-off system and various systems to monitor the chain reaction [Sections 81 and 82].

Emergency measures are also contained in Notice No. 92(18) of 1 December 1992 of the Minister of Science and Technology.

Furthermore, at the international level, Korea acceded to the 1986 Conventions on Early Notification of a Nuclear Accident and on Assistance in the Case of a Nuclear Accident or Radiological Emergency respectively on 8 June 1990.

5. Trade in Nuclear Materials and Equipment

Import and export procedures for nuclear reactors and related facilities, nuclear fuel materials and radioisotopes must be determined by the Minister of Science and Technology, in agreement with the Minister of Trade, Industry and Energy [1982 Act, Section 106]. In accordance with Section 106 of the 1982 Act, detailed procedures for custom clearance of nuclear materials and radioisotopes are provided for in the “Unified Public Notice” issued by the Ministry of Trade, Industry and Energy.

The legal basis of export and import control of nuclear materials and equipment for the prevention of nuclear proliferation is the Foreign Trade Act [Act. No. 3895 of 1986]. The Ministry of Trade, Industry and Energy is responsible for the implementation of this Act. Chapter IV, Section 21 of the Act sets forth the regulations related to export control of strategic goods, including nuclear materials and equipment. The “Public Notice for the export and import of strategic goods”, under the Foreign Trade Act, provides the control list, control area, licensing procedures and government agencies which are responsible for the licensing of specific items.

The Technology Development and Promotion Act [Act No. 2399 of 1972] is also used to control the export of nuclear-related technology. The Act is implemented by the Ministry of Science and Technology.

The Korean Government revised the Public Notice under the Foreign Trade Act to adhere to the guidelines of the Nuclear Suppliers Group (NSG) (London Club). The new Public Notice came into force on 1 October 1995, before Korea joined the NSG and the Zangger Committee.

The export and re-export of nuclear items are subject to the approval of the relevant governmental agency. Nuclear items on the control list of NSG Part I and related technology are subject to the approval for the Ministry of Science and Technology before their export or import. In the case of dual use items, the Ministry of Trade, Industry and Energy gives the approval of export and import. In approving the export and import of nuclear-related technology, the Ministry of Science and Technology must consult with the Ministry of Trade, Industry and Energy.

Any person who has obtained export approval in a false or unlawful manner and any person who has exported nuclear materials and equipment without permission is liable to punishment by imprisonment for not more than five years or to a fine ranging up to three times the price of the goods concerned [Foreign Trade Act, Section 54]. This Section also applies in the case of export which has taken place without prior licensing.

6. Radiation Protection

The Atomic Energy Act of 1982, as amended in 1986, lays the foundations for the radiation protection regime [Section 97]. It requires nuclear operators to take the necessary action to prevent and control the effects of radioactivity on human health. New provisions were incorporated in the Framework Act in 1995 concerning in particular a radiation dosimetry system, intended to ensure greater reliability in the management of radiation exposure of workers [Section 90(4)]. Also, the ALARA (As Low As Reasonably Achievable) principle was incorporated in the Act in 1995. This principle has been used in implementing radiation safety programmes.

The radiation protection regime is described in greater detail in Presidential Decree No. 10927 of 1982 [Chapter VI], as amended, and Ordinance No. 275 of 1983 [Chapter V], as amended.

a) Protection of workers

The 1982 Decree stipulates that, following the use of radioactive materials, a nuclear operator must assess exposure to radiation and the level of contamination within the installation and the area under surveillance [Section 298]. Since the purpose of this monitoring is to avoid jeopardising the health of workers and of other people with access to the areas at risk, regular monitoring is necessary, especially in the radiation areas; these areas are listed in a table inserted into Section 107 of the 1983 Ordinance.

The same Decree also provides that workers and all other persons having access to areas at risk shall undergo periodic compulsory medical examinations [Section 299]. These examinations shall consist of consultations with specialists (to describe working conditions and the symptoms experienced) as well as a series of strictly medical examinations [1983 Ordinance, Section 109]. The results of these examinations must be noted and kept permanently in each worker's file. On the other

hand, the medical files of former employees must be submitted to the Minister of Science and Technology or handed over to specialised institutions designated by the aforementioned Minister [Section 122].

b) Protection of the public

General information on the protection of the public can be found in Section 96 of the 1982 Act. This provision calls for the establishment of an exclusion area around a reactor, related facilities or a nuclear fuel cycle facility. The purpose is to protect human health, property and the general public from the hazards of ionising radiation. A presidential decree may order and determine restrictions of access or residence of the public in the exclusion area [Section 96(2) and (3)].

More specific provisions on radiation safety control for the public are dealt with in Notice No. 94(7) of the Minister of Science and Technology [Notice of 29 February 1984, revised on 9 September 1996]. This Notice establishes the maximum permissible concentration of radiation in air and water and radiation exposure dose limits for the human body.

7. Radioactive Waste Management

In 1996, the Korean Government decided to change the administrative system for radioactive waste management. The Korean Electric Power Corporation (KEPCO) is now in charge of radioactive waste management, which was previously under the competence of the Korean Atomic Energy Research Institute (KAERI).

Radioactive waste management operations consist of the following:

- treatment and disposal of radioactive waste;
- transport and disposal of radioactive waste resulting from the shutdown or decommissioning of nuclear installations;
- packaging, transport and interim storage of spent fuel;
- site selection, purchase, construction and operation of permanent disposal facilities or interim storage facilities for radioactive waste and spent fuel; and
- research, development and analysis related to radioactive waste management.

Korea is a Party to the 1972 London Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter.

8. Non-Proliferation and Physical Protection

Korea ratified the 1968 Treaty on the Non-Proliferation of Nuclear Weapons (NPT) on 23 April 1975, the 1979 Convention on the Physical Protection of Nuclear Materials on 7 April 1982, and the 1996 Comprehensive Nuclear Test Ban Treaty on 24 September 1999. In connection with the NPT, the Safeguards Agreement between Korea and the IAEA has been in force since

14 November 1975, and the government established a state system for the accounting and control of nuclear materials (SSAC) at the Ministry of Science and Technology, immediately after the Safeguards Agreement entered into force.

In Korea, safeguards and physical protection of nuclear materials are provided for in the Atomic Energy Act together with subsidiary legislation. The latest amendment to the Atomic Energy Act concerning safeguards and physical protection matters was adopted in December 1994 and entered into force on 5 January 1995. The amendment provides the legal basis for state inspections by the Minister of Science and Technology. The state inspection system has unique features. Under the Atomic Energy Act, each nuclear facility must prepare an “Accounting and Control and Physical Protection Procedure” and submit it to the government for approval. The purpose of the state inspection is to determine whether or not the nuclear facility is being operated according to the approved Procedures. On safeguards and physical protection matters, all detailed regulations are to be provided for in Notices of the Minister of Science and Technology. Four Notices related to safeguards and physical protection entered into force on 23 July 1996.

In addition to the international framework referred to in the opening paragraph of this section, the Republic of Korea and the Democratic People’s Republic of Korea concluded an agreement in which both countries pledge to refrain from producing, possessing or using nuclear weapons (31 December 1991). This bilateral agreement and the resulting sectoral non-proliferation pact call for the creation of a Commission to participate in the inspection of both countries’ nuclear installations in order to verify the absence of weapons of any sort. To date, this Commission has not yet been established and the implementation of mutual inspections under the bilateral agreement has not taken place.

9. Transport

Regulations relating to the transport of radioactive materials are set forth in Sections 86 *et seq.* of the 1982 Atomic Energy Act, as amended.

Any nuclear operator planning to transport radioactive materials, etc. outside the workplace must notify the Minister of Science and Technology accordingly [Section 86]. The notification must include a series of documents listed in Section 99(2) of the 1983 Ordinance. The Minister, after examining an application, may request that any information he deems unclear or inadequate be corrected or supplemented [1982 Decree, Section 235(2)]. In addition, operators must submit the radioactive materials to be transported for inspection by officers of the Ministry of Science and Technology, in order to verify whether a transport licence may in fact be issued [1982 Decree, Section 237].

Under the 1994 amendment of the 1982 Act, packages for the transport of radioactive materials are to be inspected and certified by officers of the Ministry of Science and Technology, in order to ensure a higher level of safety in the transport of radioactive materials [Sections 90(2) and (3)].

Transport by rail, road, sea or air, as well as the packaging of transported materials, must comply with the technical standards established by ministerial decree [Act of 1982, Section 87]. The packaging conditions are laid down in the 1982 Decree, as amended in 1989 [Sections 239 and 240]:

- radioactive materials must be sealed within a container labelled to indicate the nature and quantity of the contents;

- handling must be simple and safe;
- steps must be taken to ensure that changes in temperature or pressure do not cause a container to break;
- preventive measures must be taken against any leakage or chemical or electrical reaction arising from contact between packaging and the radioactive materials contained therein, etc.

These requirements do not apply to the transport of low-level materials listed in Section 101 of the 1983 Ordinance.

The 1982 Decree supplemented these procedural rules with a separate regime for each possible mode of transport [Sections 241 *et seq.*: Vehicles; Sections 256 *et seq.*: Ships; Sections 267 *et seq.*: Aircraft].

The regime described above applies to the transport of radioactive materials only; there is a separate transport procedure for source materials, and yet another for radioisotopes. Nevertheless, an analysis of these provisions reveals a clear similarity among the various modes of transport.

Source materials must be placed in appropriate containers that provide total insulation. Each container must be labelled to indicate the nature and quantity of its contents. In addition, source materials must be packaged in such a way as to absorb and neutralise the radiation they emit. The radiation given off at the surface of the container must not exceed 200 millirems per hour [1982 Decree, Section 189].

The procedure for transporting radioisotopes and materials contaminated by radioisotopes is established in Section 218 of the 1982 Decree. As above, transport must be carried out in special containers, except for cases in which:

- measures to prevent the leakage and dispersion of radiation are taken prior to transport; or
- preventive action to reduce the danger of radiation has been formally approved by the Minister of Science and Technology.

Ionising radiation levels at the surface of containers must not exceed the thresholds imposed by the Minister of Science and Technology, and the weight of substances transported must not compromise minimal safety measures. Further information on precautions to be taken prior to and during transport is also set out in Section 218.

10. Nuclear Third Party Liability

Korean legislation on nuclear third party liability is to be found in Act No. 2094 of 24 January 1969 on compensation for nuclear damage, as amended by Act No. 2765 of 7 April 1975, Act No. 3549 of 1 April 1982 and Act No. 3849 of 12 May 1986. Additional, more detailed provisions regarding this legislation were introduced by Presidential Decree No. 5396 of 3 December 1970, which was in turn amended by Presidential Decrees No. 6701 of 25 May 1973, No. 7756 of 22 August 1975 and No. 12092 of 19 March 1987. This legislation is supplemented by Act No. 2764 of 7 April 1975 on indemnification agreements for the compensation of nuclear damage. Presidential

Decree No. 7755 of 22 August 1975, as amended by Presidential Decree No. 12093 of 19 March 1987, further specifies the conditions of the regime.

Act No. 2094 on Compensation for Nuclear Damage covers the nuclear damage caused by the operation of reactors, processing and reprocessing activities, and the use of nuclear fuels, as well as the transport, storage and disposal of nuclear fuels or of items contaminated therefrom [Section 2].

This Act holds operators liable for nuclear damage caused by the carrying out of an activity listed in Section 2. This liability is strict and exclusive. In the event nuclear materials are transported between operators, the consignor is liable for any damage, unless the operators involved have agreed otherwise [Section 3]. The Act nevertheless provides for exemptions from liability under special circumstances such as earthquakes, war, natural disasters or other similar events.

The Act contains no express provision limiting an operator's liability. The operator is required to take out insurance or some other form of financial security of an amount that varies according to the category and power of the installation involved [Section 5]. Unless an operator has constituted a deposit to cover his obligation to provide compensation for nuclear damage, he must, in addition to his insurance policy, have concluded an indemnification agreement with the government to provide for such compensation. Under such agreements, the government agrees to bear the cost of all compensation due under the Act, up to the maximum financial security an operator is required to maintain, in so far as this security is not covered by the operator's insurance [Section 9(1)].

In addition, the indemnification agreement also makes the government responsible for compensating nuclear damage caused by tidal waves, floods, storms or lightning, or if unavoidable circumstances prevent a claim from being filed within the dates between which the relevant insurance contract is valid [Act No. 2764 of 7 April 1975, Section 4(2); and Decree No. 7755 of 22 August 1975, Section 2(2)].

As regards international aspects, it should be pointed out that Korea is not currently a party to any of the conventions on nuclear third party liability.

II. INSTITUTIONAL FRAMEWORK

Korean legislation has been extensively revised since the Framework Act was adopted in 1958, bringing about a gradual but significant administrative re-structuring. As a result, most nuclear-related bodies have been substantially transformed, in both their form and their powers. One example is the former Atomic Energy Office, which was established on 21 January 1959 under the Framework Act, dissolved in 1973 and re-convened as the "Nuclear Energy Bureau", under the auspices of the Ministry of Science and Technology, with significantly reduced responsibilities.

In Korea, nuclear-related activities are organised and supervised by the Atomic Energy Commission, the Ministry of Science and Technology or the Ministry of Trade, Industry and Energy, as the case may be. Sometimes joint action is required.

The two Ministries are made up of specialised departments and technical bodies of a public or semi-public nature, which deal with topical issues. In the area of research, the Korean Atomic Energy Research Institute (KAERI) plays a predominant role.

1. Regulatory and Supervisory Authorities

a) Minister of Science and Technology, including the Nuclear Energy Bureau

Generally speaking, the Minister of Science and Technology ensures the enforcement of nuclear legislation, as embodied in the Framework Act of 1982, save where jurisdiction is expressly conferred on the Minister of Trade, Industry and Energy or the Atomic Energy Commission. However, some functions require joint action.

The Minister of Science and Technology is invested with extensive powers. The Minister is in charge of:

- establishing basic policies for the promotion of science and technology programmes;
- co-ordinating the ministers responsible for establishing policies related to nuclear technology;
- establishing training programmes for highly qualified scientists and engineers;
- financially supporting national research centres and subsidiary scientific institutes within the government; and
- promoting international technical co-operation and securing a desirable environment for scientific and technical progress.

In performing his tasks, the Minister receives technical support from several bodies, including the Korean Atomic Energy Research Institute (KAERI) and the Korean Institute for Nuclear Safety (KINS) (see below Section 2 “Advisory Bodies”).

Nuclear Energy Bureau

i) Legal status

The origins of the Nuclear Energy Bureau date back to Korea’s first law relating to atomic energy, in the late 1950s. Until 1973, the Bureau was continuously involved in the nuclear decision-making process, but its role was re-defined by Act No. 2437 of 15 January 1973. Today, the Nuclear Energy Bureau is part of the Minister of Science and Technology.

ii) *Responsibilities*

The Nuclear Energy Bureau consists of four divisions and their functions are described below. Also, the Nuclear Safety Officer assists and advises the Director-General of the Nuclear Energy Bureau on nuclear safety and radiation activities.

The *Nuclear Policy Division* is responsible for:

- definition of basic policy for the use and development of nuclear energy as well as its short and long-term objectives;
- collection and dissemination of information on nuclear energy;
- provision of staff support for the Atomic Energy Commission;
- drafting and amendment of the Atomic Energy Act and its related decrees;
- establishment of a system for promotion of nuclear activities;
- operating the national and international safeguards system;
- performing export and import control of nuclear items on the trigger list; and
- checking and inspecting the physical protection of nuclear materials.

The *Atomic Energy International Co-operation Division* is responsible for:

- establishment and management of the international co-operation policy;
- operation of bilateral nuclear joint committees;
- implementation of bilateral and international nuclear energy co-operation agreements;
- co-operation with the International Atomic Energy Agency and the OECD Nuclear Energy Agency; and
- preparing mutual inspections between North Korea and South Korea in the framework of the Joint Declaration on the Denuclearisation of the Korean Peninsula.

The *Nuclear Safety Division* is responsible for:

- licensing the production, construction, ownership, control, management and operation of nuclear reactors and installations;
- licensing the acquisition, production, import and export, possession, control and management of nuclear material and nuclear fuel cycle facilities;
- management of nuclear safety regulatory affairs;
- regulatory review of design and construction methods;

- verification and inspection of nuclear installations, nuclear reactor performance tests, including pre-operational tests, start-up tests and nuclear reactor operation; and
- analysis and assessment of operational safety-related events.

The *Radiation Safety Division* is responsible for:

- licensing and supervision of the use of radioisotopes and industrial X-ray apparatus;
- control of the transport and disposal of radioactive materials;
- assessment of the effects of nuclear activities on the natural habitat near the installations;
- licensing of holders of radioactive materials; and
- establishment and co-ordination of radiological emergency measures and of physical protection of nuclear facilities.

b) *Minister of Trade, Industry and Energy*

The task of the Minister of Trade, Industry and Energy is to propose general policy with regard to energy production and the utilisation of resources, in accordance with the recommendations of the Atomic Energy Commission. This action takes the form of a series of activities intended chiefly to conserve resources and ensure that energy is used rationally. More specifically, he defines basic policy with respect to programmes for the development of nuclear energy and supervises the electricity generation of nuclear power plants.

Special attention must be given to the Electric Power Office, which includes a Nuclear Power Division. The functions of this Division include the following:

- establishment of basic policies for nuclear power plant development;
- supervisory control of nuclear power plant construction and operation;
- control of supply and demand of nuclear fuel; and
- co-ordination of matters related to radioactive waste and spent fuel treatment.

In addition, the Ministry exercises control over a large number of energy-related bodies, including the Korean Gas Company, the Korean Electric Power Corporation and the Korean Oil Company, as well as the Institute of Energy Economics and the Institute of Energy and Resources.

2. Advisory Bodies

a) *Atomic Energy Commission*

Created by Act No. 483 of 11 March 1958 [Section 4(2)], the Atomic Energy Commission was initially responsible directly to the President of the Republic of Korea. When the Ministry of Science and Technology was created in 1967, the Commission's chairpersonship was awarded to the new minister, then to the vice-prime minister. From 1994 until 1999, this function was assured by the Deputy Prime Minister of Finance and Economic Planning [Section 5]. Since 1999, this function has been assured by the Prime Minister.

Over the years, there has been some shifting of responsibilities and a number of changes. An important change into the structure of the Commission was introduced by Act No. 5233 of 30 December 1996. The Commission was divided into two separate commissions. One is the Atomic Energy Commission whose functions were reduced; the other is the Atomic Energy Safety Commission which took responsibility for those functions which are no longer to be performed by the Atomic Energy Commission. The Atomic Energy Commission is required to deliberate and decide upon a series of important issues concerning government policies pertaining to the peaceful use of nuclear energy. Its main activities include the following:

- planning general policy on the peaceful uses of atomic energy;
- co-ordination of the competent administrative bodies;
- estimation and allocation of expenditures of bodies competent in the field of nuclear energy;
- promotion of research activities in the use of nuclear energy;
- training of researchers and engineers;
- measures concerning radioactive waste management;
- planning of protective measures against the dangers of radioactive fallout; and
- other matters that are deemed important and suggested to the Commission by its chairperson.

The Atomic Energy Commission is responsible to the Prime Minister and has seven to nine members including its chairperson, who is the prime minister. The remaining members of the Commission are the Minister of Science and Technology, the Minister of Trade, Industry and Energy, and other members recommended by the chairperson, in particular from industry, universities, and research institutes.

In addition, the Atomic Energy Commission established a special committee, the Atomic Energy Utilisation and Development Committee.

b) Atomic Energy Safety Commission

The Atomic Energy Safety Commission is established under the Minister of Science and Technology in order to make important decisions on the safety of nuclear energy. Its main activities include the following:

- co-ordination of nuclear energy safety management;
- regulation of nuclear materials and reactors;
- training of researchers and engineers in the field of nuclear energy safety management;
- management of radioactive waste; and preventive measures against radioactive risks.

The Atomic Energy Safety Commission is composed of five to seven members including its chairperson, who is the deputy prime minister.

3. Public and Semi-Public Agencies

a) Korean Atomic Energy Research Institute (KAERI)

i) Legal status

The Korean Atomic Energy Research Institute (KAERI) is a government-funded corporate body responsible for research and development of the peaceful applications of nuclear energy.

This Institute was originally established in 1959, as an affiliated organisation of the Office of Atomic Energy (OAE). OAE was established in 1959 by the Atomic Energy Act of 1958. Under OAE, there were three affiliated research institutes, namely the Atomic Energy Research Institute, the Radiological Research Institute (RRI) and Radiation Research Institute in Agriculture (RRIA).

In 1967, the administrative functions of OAE were transferred to the Atomic Energy Bureau which was newly established within the Ministry of Science of Technology (MOST).

In 1973, AERI, RRI and RRIA were merged into one and became the present KAERI, a corporate body, according to the KAERI Establishment Act [Act No. 2443 of 15 January 1973].

ii) Responsibilities

KAERI is the national nuclear research, development and training institute established to promote the peaceful uses of nuclear energy, to advise the Minister of Science and Technology with the aim of contributing to national economic development and the enhancement of public welfare, and to carry out integrated research and development activities in the nuclear field. It is also involved in developing nuclear technology and improving systems for safety and protection against ionising radiation.

In 1994, the Technology Center for Nuclear Control (TCNC) was established within KAERI in order to deal with national inspections for accounting and control of nuclear materials in all facilities covered by IAEA safeguards. This Centre plays a key role in demonstrating Korea's nuclear transparency in the world nuclear community.

iii) Structure

KAERI is operated by the Board of Trustees whose members are from, *inter alia*, the government, nuclear-related industries and academic circles.

The president is responsible for the management of the Institute. Amongst those who report to the president are the vice-presidents for basic research, advanced reactor development, nuclear fuel cycle research and development, and the Directors for the HANARO Centre (a research reactor used for training, research and isotope production), the Technology Centre for Nuclear Control (TCNC) and the Nuclear Training Centre.

In addition, KAERI operates the Korean Cancer Centre Hospital (KCCH) in Seoul as an affiliated organisation.

b) Korean Institute for Nuclear Safety (KINS)

i) Legal status

Act No. 4195 of 14 February 1990 provides for the Korean Institute of Nuclear Safety's autonomy from KAERI, to which it was previously attached. At present, the Institute is directly responsible to the Minister of Science and Technology.

ii) Responsibilities

The Institute is responsible for assisting the government in its licensing and regulating activities with particular attention to protection of public health and the environment.

It is generally responsible for the following activities related to nuclear safety:

- safety review and evaluation of nuclear installations;
- inspection of nuclear installations;
- research and development of regulatory and technical standards;
- regulation of radioisotopes and ionising radiation sources; and
- technical support for development of regulatory policy.

iii) *Structure*

KINS is made up of seven technical divisions: the Planning Division, the Nuclear Licensing Division, the Nuclear Regulatory Inspection Division, the Radiation Safety Division, the Research and Safety Development Division, the Nuclear Safety Technology Division, and the Administration Division.

c) *Korean Electric Power Company (KEPCO)*

Korea's nuclear industry is built around the national power company, KEPCO, which is the country's exclusive generator, distributor and carrier of electricity. It is the owner and operator of all nuclear power plants in Korea (at present, 16 power reactors are in operation and four reactors under construction). KEPCO also possesses 98% interest in the Korean Power Engineering Co. Ltd. (KOPEC), 41% of Korean Heavy Industries Co. Ltd. (HANJUNG), 100% of Korean Power Plant Services Co. Ltd. (KPS) and 95% of Korean Nuclear Fuel Co. Ltd. (KNFC).

KEPCO is a state-owned company which is currently responsible to the Minister of Trade, Industry and Energy. In 1989, the government sold off 21% of its shares. At the end of 1999, the government was in possession of 52% of its shares.

KEPCO is responsible in particular for:

- development of electric power resources and research in related industries;
- power generation, transmission and distribution and research in related industries;
- investment in, and contribution to, the businesses mentioned above and other projects to which the government is committed;
- training of personnel by the KEPCO Training Centre and the technical schools operated by KEPCO; and
- testing services for electrical equipment.