

Nuclear Legislation in **OECD and NEA Countries**

Regulatory and Institutional
Framework for Nuclear Activities



Mexico

Mexico

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I. General regulatory regime

1. Introduction

Mexico (the United Mexican States) has one nuclear power plant, *Laguna Verde*, located on the Gulf of Mexico. It consists of two boiling water reactors, with a capacity of 650 and 700 MWe respectively. The first unit has been operating since 1990 and the second since 1995. In 2008, these reactors produced 9.36 TWh of electricity, accounting for 6.13 % of Mexico's total electricity production. The *Laguna Verde* reactors are owned by the Mexican government and operated by the Federal Electricity Commission (*Comisión Federal de Electricidad*). Operational waste from both *Laguna Verde* units can be stored onsite. In addition to the two commercial reactors, there is a 1 MWe TRIGA MARK III research reactor at the National Nuclear Research Institute (*Instituto Nacional de Investigaciones Nucleares*). Mexico also has uranium resources.

There is a comprehensive body of laws and regulations governing Mexico's nuclear activities, the most important of which are described in the following paragraphs.

The Constitution of Mexico provides, in relation to nuclear activities, that the development of strategic areas will be the exclusive responsibility of the public sector and that the federal government will always maintain ownership and control over public bodies created for that purpose. The Constitution of Mexico provides that matters related to radioactive ores and nuclear power generation are within the scope of strategic areas (Articles 25 and 28).

The 1984 Act on Nuclear Activities, adopted pursuant to Article 27 of the Constitution (hereinafter referred to as the 1984 Act), was promulgated on 27 December 1984 and entered into force on 5 February 1985 [published in the Official Gazette (*Diario Oficial de la Federación*) on 4 February 1985]. It regulates all nuclear activities in Mexico and was also adopted pursuant to Article 27 of the Constitution.

The 1984 Act specifies that nuclear energy will be used solely for peaceful purposes, and that the federal government will establish regulations governing the use of radioactive materials (Article 2 – all references are to the 1984 Act unless otherwise specified). The act regulates prospecting for and mining of radioactive ores, the use of nuclear fuels, research in nuclear science and technology, the nuclear industry and all related matters (Article 1). These different aspects of nuclear activities will be dealt with under the appropriate headings below.

2. Mining regime

The Mexican Constitution contains provisions indicating that prospecting for, mining and use of radioactive ores will not be subject to any concession or contract, and that only the state may carry out such activities in accordance with the relevant law (Article 27 of the Constitution). Any person who has knowledge of a radioactive ore deposit must immediately notify the Ministry of Energy (Article 6 of the 1984 Act). Any person with a mining concession who discovers radioactive ores on his/her land must inform the ministry by written notification within ten days of this discovery in particular so that the property rights of the state are protected and assessment of the ores can be undertaken (Article 7).

The 1984 Act provides that the Ministry of Energy delegates exclusive responsibility for prospecting activities to a decentralised public body, the Mineral Resources Board (actually *Servicio Geológico Mexicano*). The ministry determines the board's programme of activities and technical conditions governing its work (Article 9). The 1984 Act further specifies that the ministry delegates

exploration rights for radioactive ores to another decentralised public body, the Commission for Mining Development (actually *Fideicomiso de Fomento Minero*) in accordance with the policies established for the achievement of the objectives or priorities of the national programme. This Commission was permitted to set up and operate plants for the use of such ores (Article 10). However, it has since been dissolved by the Mining Act of 26 June 1992, which assigned all its activities to the Mineral Resources Board (Article 5).

3. Radioactive substances, nuclear fuel and equipment

The regulatory regime governing radioactive substances, nuclear fuel and equipment is laid down in Chapter III of the 1984 Act under "Nuclear Industry". This definition includes, *inter alia*, the various stages of the fuel cycle which include uranium enrichment, fuel reprocessing, heavy water production, design and manufacture of nuclear equipment and components for steam supply systems in nuclear power plants, production and applications of radioisotopes. The nuclear industry is specified as being in the public interest (Article 11).

The 1984 Act provides that the production, use and application of radioisotopes are priority activities for the development of the national economy (Article 16). These activities must be carried out within the context of programmes approved by the federal government, acting through the Ministry of Energy, in accordance with the research and technical development policy established by the federal government (Articles 12 and 18).

Radioactive materials and equipment used for medical purposes require a prior licence from the Ministry of Health in addition to the licence issued by the National Nuclear Safety and Safeguards Commission (*Comisión Nacional de Seguridad Nuclear y Salvaguardias*, Article 29).

The production, use and application of radioisotopes may be undertaken either by the public sector alone, in particular by the social services, or in conjunction with the private sector. In both cases prior licensing from the Ministry of Energy is required. Licences for the production of radioisotopes based on the use of nuclear fuel are issued after hearing the opinion of the National Nuclear Research Institute (*Instituto Nacional de Investigaciones Nucleares*) and other competent authorities, depending on whether they are to be used for medical, industrial or agricultural purposes (Article 16).

The production of radioisotopes from nuclear reactors, on the other hand, may only be undertaken by public bodies, universities, institutes and research centres. They are licensed in accordance with the 1984 Act and the licences are granted by the Ministry of Energy. The Ministry also grants licences for the production of radioisotopes from nuclear fuels and publishes notification thereof in the Official Gazette (Article 16).

The possession, import, export, use, transfer, transport, storage and disposal of radioactive materials or ionising radiation-emitting equipment is prohibited without a licence of the National Nuclear Safety and Safeguards Commission (General Radiological Safety Regulations, Articles 189 and 190).

Nuclear fuels are the property of the state; and only the federal government may authorise their use in accordance with the provisions of the 1984 Act and under the control and surveillance of the National Nuclear Safety and Safeguards Commission (Article 17).

4. Nuclear installations

The 1984 Act makes a distinction between "nuclear" installations and "radioactive" installations (Article 3). "Nuclear installations" are defined as those in which nuclear fuel or nuclear material is manufactured, processed, used, reprocessed or stored. "Radioactive installations" are defined as

those in which radioactive material or equipment containing such material is produced, manufactured, stored or used. It is where radioactive waste is treated, conditioned or stored.

Nuclear electricity generation falls under the sole jurisdiction of the Federal Electricity Commission (*Comisión Federal de Electricidad*) which is responsible for the design and construction of nuclear power plants, having observed the opinion of the National Nuclear Research Institute (Article 15).

The use of nuclear reactors for purposes other than electricity generation is restricted to public bodies, universities, institutes and research centres, licensed in accordance with this act (Article 16).

a) *Licensing and inspection, including nuclear safety*

The siting, design, construction, operation, modification, shutdown, decommissioning and dismantling of nuclear and radioactive installations requires a licence granted by the Ministry of Energy. Licences for the construction and operation of such installations are valid for a limited period, and their renewal, modification, suspension or cancellation are regulated by the provisions of the relevant regulations (Article 26). Nuclear and radioactive installations must meet the siting, design and construction etc. requirements established under the act (Article 25).

Mexico ratified the 1994 Convention on Nuclear Safety on 26 July 1996.

i) *Nuclear installations*

Licences for the construction and operation of a nuclear installation are granted only following approval of the information submitted on the manner in which the safety objectives will be met. Consideration will also be given to the procedures and methods to be applied for the siting, design, construction, operation, modification, decommissioning and final shutdown of the installation. For each stage, the information necessary to assess environmental impacts must be provided to the National Nuclear Safety and Safeguards Commission. The corresponding emergency plan must also be submitted. This information must be provided in accordance with the conditions laid down by the provisions of the 1984 Act (Article 28).

Under Mexican legislation, two environmental impact assessments are required for nuclear installations. The first assessment considers the environmental impacts from their radiological, nuclear and physical safety points of view. The second assessment covers all other aspects and it is carried out under authority of the Ministry of the Environment and Natural Resources (General Act on Ecological Equilibrium and Environmental Protection, Article 154).

ii) *Radioactive installations*

The conditions for the licensing of radioactive installations are laid down by the General Radiological Safety Regulations of 22 November 1988. The National Nuclear Safety and Safeguards Commission, under the Ministry of Energy, is the licensing authority for such installations (Article 219). The Commission issues, renews, revokes and suspends permits or licences (Article 50-V of the 1984 Act on Nuclear Activities).

Applications for licences for the construction, operation, modification, shutdown or decommissioning of radioactive installations require different procedures. They must all provide information on the radiological safety of the installation concerned (Article 219).

Applicants for a licence to construct a radioactive installation must, in particular, provide the following information to the Commission (Article 220):

- description of the radiological safety characteristics to be applied in the design of the installation, and the methods for controlling the processes and materials used;
- installation and proposed activities;
- siting and
- quality assurance programme.

Applicants for a licence to operate a radioactive installation must in particular provide the following information with respect to radiological protection (Article 221):

- general specifications of the installation;
- organisational measures implemented by the applicant;
- radiological safety policy and quality assurance programme;
- group of radiological safety;
- type of ionising radiation sources;
- radiological safety characteristics in the design of the installation;
- estimation of dose equivalents;
- programme of radiological safety;
- environmental impact assessment;
- risk analysis and emergency plan; and
- procedures for decommissioning, dismantling and final shutdown.

Applications for a licence to modify a radioactive installation must include information on the reasons for the request and the radiological safety implications of the modifications to be made. They must also explain the implications of radiological safety, and the estimation of equivalent dose (Article 222).

Finally, applications for a licence to decommission, dismantle or shut-down an installation must include a detailed report with information on the decommissioning and dismantling programme in the context of radiological safety operations. A report must be submitted if there is radioactive waste detailing the procedures for its processing, conditioning and final disposal; and documentation ascertaining that the radiological safety conditions comply with those stated in the operating licence (Articles 223 and 224).

iii) Inspections

The National Nuclear Safety and Safeguards Commission is responsible for inspecting and monitoring nuclear and radioactive installations to ensure compliance with radiological safety conditions, to account for radioactive materials and for safeguards purposes (Article 32 of the 1984 Act on Nuclear Activities).

Such inspections take place at the request of interested parties or as frequently as the Commission deems necessary (1998 General Radiological Safety Regulations, Articles 235 and 236).

b) Protection of the environment against radiation effects

As already mentioned, the 1984 Act on Nuclear Activities and the 1988 General Radiological Safety Regulations provide for an environmental impact assessment in the licensing procedure for nuclear and radioactive installations (Articles 28 and 221 respectively).

In addition, Article 154 of the General Act on Ecological Equilibrium and Environmental Protection of 1988 (which entered into force on 1 March 1988) applies to nuclear activities. The act provides that the Ministry of Energy, together with the National Nuclear Safety and Safeguards Commission and, where relevant, the Ministry of Health must ensure that all such activities are carried out in accordance with the nuclear safety and radiological protection regulations in force for nuclear and radioactive installations. This is done to avoid any risk to human health and preserve the ecological equilibrium. The Ministry of the Environment and Natural Resources is the authority responsible for environmental impact assessments.

Nuclear activities referred to in the 1988 Ecological Equilibrium Act include prospecting for and mining of radioactive ores, nuclear fuel supply, all uses of nuclear energy and the nuclear industry in general. In addition, the Environmental Impact Regulations of 7 June 1988 were issued in implementation of the 1988 Ecological Equilibrium Act and entered into force on 8 June 1988. They contain detailed provisions on the subject and require, *inter alia*, risk studies, preventive and mitigating measures (Articles 3 and 5).

c) Emergency response

Both the 1984 Act on Nuclear Activities and the 1988 General Radiological Safety Regulations specify that applications for licences for nuclear and radioactive installations must include emergency plans (Articles 28 and 221, respectively).

The National Nuclear Safety and Safeguards Commission will order, or in some cases carry out, the removal, seizure and safe-keeping of ionising radiation sources or equipment containing such sources in the event of imminent danger or risk for the personnel of a nuclear or radioactive installation or for the population in general. The Commission may also order, as a preventive measure, the temporary or permanent shutdown of nuclear or radioactive installations and specify the relevant corrective measures. It may keep the installation permanently shut-down in case the measures taken are inadequate (Article 34 of the 1984 Act on Nuclear Activities).

Any person who has knowledge of an incident involving nuclear or radioactive materials or equipment containing such materials must immediately inform the Commission. Natural or legal persons licensed to carry out the activities regulated by the 1984 Act must inform the Commission immediately of such an incident. They are also required to give written confirmation within 24 hours (Article 23 of the 1984 Act on Nuclear Activities, Articles 175 and 176 of the 1988 General Radiological Safety Regulations).

The 1988 General Radiological Safety Regulations provide that, before start-up of a radioactive installation, the operator must have established an emergency plan in accordance with the conditions of the National Civil Protection System. This system must be based on a study of the radiological consequences of any accident that might occur in the installation (Article 124). The purpose of the plan is to restrict exposure to ionising radiation to a level as low as reasonably achievable (ALARA principle), control any accident that may occur and obtain all the information required to determine the causes and consequences of such an accident. Pursuant to Article 125 it should include as a minimum:

- Equipment processes for the radiological measures required to assess and determine the situation created by the accident.
- Protection measures needed to reduce exposure to ionising radiation, including financial resources.
- Intervention levels to serve as standards for the application of the above measures.
- Protection measures for the neighbouring population, in accordance with the National Civil Protection System.

The head of the radiological protection group of an installation, the occupationally exposed personnel or the licensee must also immediately report a radiological incident to the National Nuclear Safety and Safeguards Commission (Article 175 of the 1988 General Radiological Safety Regulations).

All emergency plans should be carried out in accordance with the national civil protection system (Article 124 of the 1988 General Radiological Safety Regulations). As regards the *Laguna Verde* nuclear power plant, the External Radiological Emergency Plan (*Plan de Emergencias Radiológico Externo* – PERE) provides for the participation of the federal, local and municipal authorities and specifies their responsibilities. Like all emergency plans, it is co-ordinated by the Ministry of the Interior, which is the competent authority for the national civil protection system.

Furthermore, at the international level, Mexico has been a party to the 1986 Convention on Early Notification of a Nuclear Accident, and the 1986 Convention on Assistance in the Case of a Nuclear Accident or Radiological Emergency since 10 May 1988.

5. Trade in nuclear materials and equipment

The federal government, through the Ministry of Energy and in co-operation with other competent authorities, is the authority responsible for controlling the import and export of nuclear materials and fuels. Radioactive ores or material will be exported having regard to national needs and will in no case exceed five percent of known resources. This is in accordance with the national development programme provided for in Article 26 of the Constitution of the United Mexican States (Article 18-V of the 1984 Act on Nuclear Activities). For the purposes of security, registration and control, the National Nuclear Safety and Safeguards Commission provides an expert opinion and final authorisation prior to the licensing of imports and exports of radioactive materials, equipment containing such material, and nuclear materials and fuels (Article 50-IX of the 1984 Act on Nuclear Activities).

Applicants for a licence to import ionising radiation sources must, in particular, submit to the Commission, the following information: the number of their operating permit or licence, the activity level of the radioisotopes, their physical and chemical form, the specifications of the equipment containing the radioactive material, the type of packaging and a physical protection and radiological safety plan (1988 General Radiological Safety Regulations, Article 192). The same procedure applies for exports of ionising radiation sources (Article 195 of the same Regulation).

A Decree of 30 June 2007, which entered into force on 1 July 2007, sets out the list of goods which require import and export licences. It provides for controls over the import and export of nuclear and radioactive materials including nuclear fuel, radioisotopes, radioactive waste and ionising radiation-emitting equipment. The scope of the decree also applies to materials used for medical purposes. Pursuant to the decree, all export and imports into Mexican territory, either on a temporary or permanent basis, require a licence issued in advance by the Ministry of Energy through the National Nuclear Safety and Safeguards Commission (Articles 1 and 2). The licence is to be presented by the applicant before any import or export of the listed material (Article 3).

The health authority also requires a health permit prior to the import or export of ionising radiation sources for medical purposes (1988 General Health Act, as amended in 1991, Article 125).

6. Radiation protection

The regulations governing radiation protection in Mexico were adopted in implementation of the 1984 Act and the 1988 General Radiological Safety Regulations. Official Standards on Radiological Safety were issued by the Ministry of Health in 1993, and Official Standards on Safety at Workplaces involving ionising radiation sources were issued by the Ministry of Labour and Social Security the same year.

The 1984 Act provides that natural or legal persons authorised to operate nuclear or radioactive installations are directly responsible for radiation safety and arrangements must be made for the retention of the necessary personnel who will be responsible for providing advisory assistance, training, evaluating working procedures, monitoring and preparing safety manuals in all matters related to radiation protection in the workplace (Article 27).

Since June 1996, a federal agreement between the Ministry of Energy, the Ministry of Health and the National Nuclear Safety and Safeguards Commission has established that the Ministry of Health is responsible for the evaluation, licensing, importation, exportation, checks, audits, verifications and inspections etc. of X-ray equipment used for medical diagnosis.

The 1988 General Radiological Safety Regulations are the most important in this series of regulations and they cover all aspects of radiation protection., The National Nuclear Safety and Safeguards Commission, under the control of the Ministry of Energy, is the competent authority in this respect (Article 4).

The regulations set out the dose limitation regime, specifying that the authorised limits are those set by the Commission on dose equivalent limits and exposure conditions, and on the measures to be taken for planned or emergency exposures (Title III, Articles 7 to 55 of the 1988 General Radiological Safety Regulations).

The regulations provide, *inter alia*, that ionising radiation sources, sealed or unsealed, as well as equipment which emits ionising radiation must be equipped with a safety system. The licensees may only modify the design or operating conditions of these sources or equipment with prior approval of the Commission (Articles 56 and 57), and they cannot be transferred without a licence or authorisation from the Commission (Article 58). With regard to the use of X-ray equipment for medical diagnosis, the technical standards to be complied with are laid down by the Ministry, through the Commission (Article 91). Nevertheless, radiation protection regulations relating to the use of ionising radiation sources exclusively for medical purposes are also within the competence of the Ministry of Health (General Health Act, 1991, Articles 124 and 125).

A Decree of 15 April 1997 amended the provisions of the General Health Act (Official Gazette of 7 May 1997) in relation to the use of toxic and dangerous medications. In particular, Article 125 of the act now provides that, in the case of radioactive sources for medical or diagnostic use, the Ministry of Health will issue the necessary licences in co-ordination with the National Nuclear Safety and Safeguards Commission.

The 1988 Regulations lay down the obligations of licensees and radiation personnel. In particular, all licensees, as already specified in the 1984 Act on Nuclear Activities, must establish a radiological protection group in their installations. This group is responsible for the implementation and surveillance of all radiation protection measures in the workplace (Articles 145 and 27 respectively).

All occupationally-exposed personnel must have received appropriate training for their particular work and the relevant authorisation by the Commission. They must have knowledge of and apply the basic radiation protection principles and the instructions in the installation's radiological safety manual and emergency plan (Articles 159-IV and 160-I, V and XIII).

The regulations also provide for preventive measures in the event of an ionising radiation hazard. In this respect the regulations specify that the Commission may order the temporary, partial or total closure of the radioactive installation involved. With regard to hazards from ionising radiation sources or ionising radiation-emitting equipment, the Commission may remove them or dispose of them whenever it considers it necessary for safety purposes (Article 182).

Since 1996, the Ministry of Energy, through the National Nuclear Safety and Safeguards Commission, has issued several technical regulations to implement the 1988 General Radiological Safety Regulations. These mandatory provisions are issued as official standards and deal, *inter alia*, with the following subjects: determination of dose limits for workers and the general public; classification of radioactive facilities, nuclear materials and radioactive waste; use of radioactive material for medical purposes; packaging and labelling for the transport of radioactive material; requirements for the conditioning, storage and disposal of radioactive waste; use of industrial radiography equipment etc.

The General Health Act, which has been in force since 1 July 1988 and the General Radiological Safety Regulations (Official Gazette of 22 November 1988), implementing the 1984 Act, originally applied to all radioactive installations, transport of radioactive materials and waste and radiation sources. Both were modified by a Decree published on 14 June 1992 which has been in force since September 1991. The modification restricts the authority of the Ministry of Health to activities involving radiation sources for medical purposes (Article 198). The Ministry of Health is the authority responsible for implementing the regulation (Article 4). The regulation prohibits the operation of an installation where radiation sources or radioactive materials are used or disposed of without a health licence issued by the Ministry of Health. Persons responsible for radiological safety must ensure that patients undergoing treatment are adequately protected in accordance with the Ministry of Health's standards for such establishments (Article 103).

A licence from the health authorities is still required for the possession, import and export of, trade in, transport and use of ionising radiation sources for medical uses (Article 125).

On 11 October 1994, the Ministry of Health issued the Official Standards No. NOM-002-SSA-2-1993, which repeal the standards issued on 2 February 1988, for the organisation, operation and health engineering of radiotherapy services. They set out revised general rules which apply to personnel using ionising radiation for diagnosis and are mandatory in public and private establishments. On 17 October 2008, the Ministry of Health issued the project of modification of that official standard, published in the Official Gazette as *PROY-NOM-002-SSA3-2007*, for the organisation, operation and health engineering of radiotherapy services, but *the amendment standard project is not in force yet*.

Furthermore, the Ministry of Labour and Social Security revised the standards issued on 15 February 1991 and published a new Official Standard No. NOM-012-STPS-1999 on 20 December 1999 (modifying the previous NOM-012-STPS-1993) on health and safety at workplaces where ionising radiation sources are handled, stored or transported, and which are capable of contaminating the working environment. This standard entered into force on 20 February 2000. The standard defines the duties of employers in such workplaces and provides that they must implement preventive measures and controls to ensure that employees do not receive radiation doses in excess of prescribed dose limits. The 1988 Regulations on Radiological Protection also establish employees' obligations in relation to medical examinations, restrictions due to radiological safety etc. The tables set out the maximum permissible intake limits of radionuclides. A federal regulation relating to safety, health and the environment in the workplace of 20 January 1997 further extends the powers of the Ministry of Labour and Social Security to

make rules governing the prevention of accidents in the workplace and ensuring that health and safety conditions for workers conform to those established by the federal labour legislation.

7. Radioactive waste management

The 1984 Act specifies that the federal government, through the Ministry of Energy, is responsible for the storage and disposal of nuclear fuels and radioactive waste irrespective of their origin (Article 18-VII).

The conditions governing applications for a licence for the establishment of a final repository and for the processing, conditioning and final disposal of low and intermediate level radioactive waste are the same as those for radioactive installations. These conditions are laid down in Articles 219, 220, 221 and 223 of the 1988 General Radiological Safety Regulations (see *supra*, Article 4 "Nuclear Installations"; Articles 202 and 206).

The National Nuclear Safety and Safeguards Commission classifies radioactive waste according to its specific activity, radiotoxicity, chemical and physical form etc. (Article 207 of the 1988 General Radiological Safety Regulations).

The final disposal of flammable, explosive, liquid or compressed gaseous radioactive waste is prohibited (Article 204). Final disposal of radioactive waste at sea is also prohibited (Article 205 of the 1988 General Radiological Safety Regulations). It is also forbidden to mix radioactive waste with other materials except as part of a conditioning process approved by the Commission (Article 208).

The Commission may authorise licensees of radioactive installations, which produce low or medium level liquid radioactive waste from unsealed sources, to dump the waste in the installation's drainage system under specific conditions laid down by the regulations (Article 211 of the 1988 General Radiological Safety Regulations).

The National Nuclear Safety and Safeguards Commission has also issued Standard No. NOM-004-NUCL-1994, which sets out the criteria governing the identification and classification of radioactive waste produced by the nuclear industry, as defined by Article 11 of the 1984 Act. These standards apply to the management, processing, storage, disposal and transportation of nuclear material (Official Gazette of 4 March 1996).

The processing, conditioning and final disposal of radioactive waste from high-level sealed and unsealed radioactive sources may only be undertaken in accordance with the Safety Regulations for Nuclear Installations (Article 214 of the General Radiological Safety Regulations).

In August 1996, the Ministry of Energy adopted three regulations in the field of radioactive waste management. These regulations, published in the Official Gazette on 12, 14 and 15 August 1996 respectively, entered into force on the day following their publication. The first of the regulations (NOM-018-NUCL-1995) defines the methods to be used to determine the concentration of radioactivity in radioactive waste containers so as to ensure proper treatment, conditioning and permanent storage of the waste. The second regulation (NOM-019-NUCL-1995) deals with the requirements for operating a permanent surface storage facility (up to 30 meters underground) for containers of low-level radioactive waste in gaseous, liquid or solid form. The third regulation (NOM-020-NUCL-1995) relates to the requirements for radioactive waste incineration facilities and provides, *inter alia*, that such a facility must be constructed and operated so as not to permit a dose to the public in excess of 0.10 mSv per year.

The conditioning and final disposal of radioactive waste from ionising radiation sources arising from medical uses are also subject to a licence from the Ministry of Health, in co-operation

with the National Nuclear Safety and Safeguards Commission (General Health Act, 1988, Articles 125 and 375-III, and 1988 Regulations, Articles 146-III and 149-V, as amended in 1991).

On 7 April 1975, Mexico ratified the 1972 London Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter.

8. Non-proliferation and physical protection

According to Article 27, paragraph 7 of the Constitution, nuclear energy may only be used for peaceful purposes. Article 2 of the 1984 Act reiterates this principle.

The 1984 Act on Nuclear Activities sets out definitions for non-proliferation and physical protection as follows:

- The purpose of safeguards is to organise and maintain a national system of control and registration of all nuclear materials to ensure that none of the said materials are diverted from peaceful applications to manufacture nuclear weapons or other non-authorised uses (Article 24).
- The purpose of physical protection in nuclear and radioactive installations is to avoid intentional acts which harm or may harm public health and safety such as theft or the unauthorised use of nuclear or radioactive materials (Article 22).

The National Nuclear Safety and Safeguards Commission inspects nuclear and radioactive installations to account for materials, to control and check the physical protection measures and the application of safeguards in installations (Articles 32 and 50-XII).

Following such inspections, the Commission will give its opinion on the deficiencies or anomalies and propose the corrective measures required. It will then check that the measures have been implemented (Article 33).

Mexico ratified the 1968 Treaty on the Non-Proliferation of Nuclear Weapons on 21 January 1969 and the 1996 Comprehensive Nuclear Test Ban Treaty on 5 October 1999. It is also party to the 1979 Convention on the Physical Protection of Nuclear Material, ratified on 4 April 1988.

Furthermore, Mexico is the depository of the 1967 Treaty for the Prohibition of Nuclear Weapons in Latin America (Tlatelolco Treaty) and has been party to the Treaty since 20 September 1967.

9. Transport

The Ministry of Energy is the authority responsible for regulating the transport and storage of nuclear fuels and radioactive waste (1984 Act, Article 18-VII). The transport of radioactive materials and equipment that emits ionising radiation requires a licence from the Ministry of Energy, acting through the National Nuclear Safety and Safeguards Commission (Article 29). Such licences are delivered in accordance with provisions set out in Article 30.

Pursuant to Article 198 of the 1988 Radiological Safety Regulations, applicants seeking a licence to transport radioactive materials must:

- identify the person responsible for radiation protection;
- describe the radioactive material to be transported, including the containers and packaging;

- describe in detail the physical protection and radiological safety plan;
- describe the safety equipment and devices;
- submit a risk analysis and emergency plan in the event of an accident involving radioactive materials during transport or during storage in transit;
- specify the route to be followed throughout the transport operation; and
- provide the name of the entity legally authorised to provide the security for any damage caused by ionising radiation.

The radiological safety rules applicable to the transport of radioactive materials are established in the transport regulations for each mode of transport (Article 199). Regulations in that respect are to be issued by the National Nuclear Safety and Safeguards Commission. The transport of nuclear and radioactive materials is also subject to the Regulations for the Transport by Land of Dangerous Materials and Wastes, published in the Official Gazette on 7 April 1993 and in force since 8 April of the same year. The competent authority is the Ministry of Communications and Transport. These provisions apply to the transport of materials classified as No. 7 "Radioactive Materials" (Article 18), irrespective of the provisions to be issued by the National Nuclear Safety and Safeguards Commission.

The Ministry of Communications and Transport issued Official Rules NOM-003-SCT2/1994 to implement the Regulations for the Land Transport of Dangerous Materials and Wastes. These rules entered into force on 8 April 1993 and set out the labelling requirements for packages of dangerous materials conveyed by land transport, including radioactive materials which are categorised as Class 7 dangerous materials. The obligation to have insurance cover for damage arising during the transportation of dangerous materials (as provided by Articles 109 and 122 of the 1993 Regulations), has been deferred by the Ministry of Communications and Transport in order to give the Mexican insurance industry time to respond to this requirement.

10. Nuclear third party liability

The Act on Third Party Liability for Nuclear Damage was published in the Official Gazette on 31 December 1974 and entered into force on 1 January 1975. The act regulates third party liability for any nuclear damage caused by the use of nuclear reactors, nuclear fuels or the resulting radioactive waste (Article 1 – All references under this heading are to the Act on Third Party Liability unless otherwise specified).

"Nuclear damage" is defined as loss of life, personal injury, or any damage or material loss resulting directly or indirectly from the radioactive properties (or a combination of such properties) that have toxic, explosive or other properties of nuclear fuel, radioactive products. "Nuclear damage" may also be the result of waste or hazardous substances which are either produced in, emitted from or sent to a nuclear installation [Article 3(c)].

The "operator of a nuclear installation" is defined as the person designated or authorised as such by the competent authority of the state within whose jurisdiction the installation is situated [Article 3(e)].

A nuclear operator is strictly liable for nuclear damage (Article 4) caused by a nuclear incident occurring in a nuclear installation for which he is responsible, or by an incident involving hazardous nuclear substances produced in his installation [Articles 3(a) and 5].

Where nuclear damage involves the liability of more than one operator, the operators concerned are jointly and severally liable (Article 8). The cumulative liability of those operators may not, however, exceed the maximum limits laid down by the act (Article 9).

The operator of a nuclear installation is liable for damage caused by a nuclear incident occurring during the transport of nuclear substances until such time as the substances are unloaded from the means of transport at the agreed location or at the delivery address. The operator is also liable until such time as the operator of another nuclear installation has assumed responsibility therefore (Article 6). The carrier or shipping agent may take over the operator's liability with regard to the nuclear substances, provided he meets the requirements of the act and any applicable regulations (Article 7). Before each transport operation, the operator must supply a certificate indicating his name and address, the nature and quantity of the substances shipped and specify the statutory amount of his liability. The certificate must be accompanied, *inter alia*, by a certificate from his insurer or financial guarantor (Article 10).

If the liable operator shows that the nuclear damage resulted wholly or in part from the fault or deliberate omission of the person having suffered the damage, or from that person's gross negligence, the competent court may decide to relieve the operator wholly or in part from his obligation to compensate that person (Article 13).

The operator is not liable for a nuclear incident which is the direct consequence of war, invasion, insurrection or a natural disaster (Article 11).

The maximum amount of the operator's liability is established at 100 million Mexican pesos (MXN) for each nuclear incident (Article 14). However, in view of Mexico's obligations under the 1963 Vienna Convention on Civil Liability for Nuclear Damage, to which it has been a party since 25 April 1989, the nuclear operator's liability cannot amount to less than the minimum set by the convention.

The act contains no special provision regarding the type of insurance or financial security the operator must take out to cover his liability. However, this obligation, also referred to in transport documents, appears indirectly in Article 23 which provides that public bodies are exempt from the requirement to obtain such insurance of financial security to cover the nuclear damage referred to in the act.

There is no provision for state funding.

The right to claim compensation for nuclear damage is extinguished ten years from the date of the incident (Article 19). That term is extended to 15 years in case of deferred personal injury (Article 21).

In accordance with the Federal Code of Civil Procedure, the federal court where the defendant is domiciled has jurisdiction over cases in which this act applies (Article 25).

11. Nuclear terrorism

On 9 July 2007, Mexico published in the Official Gazette the Decree of the International Convention for the repression of Nuclear Terrorism Acts, signed in New York City, on 14 September 2005.

II. Institutional framework

The federal government

The federal government is the supreme authority in Mexico regarding nuclear matters. However, it acts through the Ministry of Energy in accordance with Article 33 of the Law of the Public Federal Administration. This article entered into force on 29 December 1994 and granted the Ministry of Energy jurisdiction to issue all official standards dealing with, *inter alia*, nuclear safety, safeguards and radioactive materials. The Ministry delegates some of its responsibilities to the National Nuclear Safety and Safeguards Commission pursuant to the 1984 Act.

The 1984 Act on Nuclear Activities (Article 18) provides that the federal government, through the above ministry, is responsible for:

- Establishing the framework for the use and development of nuclear energy and technology in accordance with the national energy policy.
- Initiating, supervising and, in some cases, approving the programmes of work of the Mineral Resources Board and the Commission for Mining Development in connection with radioactive ores so as to achieve congruity in the programmes and projects in the field of research, application and generation of nuclear energy and development of the nuclear industry.
- Regulating nuclear and radiological safety and physical protection as well as safeguards and supervising the implementation thereof.
- Establishing the stages of the nuclear fuel cycle.
- Regulating the import and export of nuclear material and fuels, together with the other competent authorities.
- Establishing the nuclear industry's research and technological development policy.
- Regulating the transport and storage of nuclear fuels and radioactive waste.
- Implementing the international agreements concluded in the nuclear field.

1. Regulatory and supervisory authorities

a) Ministry of Energy

An internal regulation of the Ministry of Energy of 4 June 2001 (which entered into force on 19 June 2001) sets out the structure of the ministry and the responsibilities which, in accordance with the 1984 Act on Nuclear Activities, are delegated to it by the federal government.

The General Directorate for Electric Installations and Nuclear Resources has several duties in the nuclear field. In particular, the General Directorate may (Article 19-V to XII of the 1984 Act):

- Deliver formal opinions or propose a resolution with regard to the assignment, modification and cancellation of authorisations for the exportation or use of radioactive minerals.

- Provide formal opinions concerning feasibility studies on the exploitation of radioactive minerals.
- Co-ordinate and supervise activities related to Article 18 of the 1984 Act, except those pertaining to Chapter III.
- Propose policies in furtherance of the peaceful use of nuclear energy.
- Carry out and monitor tasks related to the radioactive waste management plan and radiological emergency programmes.
- Co-ordinate inter-institutional activities for the transport of nuclear fuel.
- Participate, in co-operation with the National Nuclear Safety and Safeguards Commission, in the elaboration of official standards governing the use of nuclear energy and nuclear materials.

The General Directorate for International Affairs and the National Nuclear Safety and Safeguards Commission are responsible for ensuring the proper application of Mexico's international agreements in the nuclear field (Article 15- I, IV, V and IX of the 1984 Act).

b) Ministry of Health

The Ministry of Health has responsibilities in the field of general health, as specified in Articles 26 and 39 of the Law of the Federal Public Administration, including radiation protection and the use of ionising radiation for medical purposes. In addition to the licences required for activities involving nuclear or radioactive substances, a health permit from the Ministry of Health is required for medical establishments using radiation sources (Decree of 14 June 1991, amending the General Health Act, Article 125).

As already mentioned, the Ministry has issued standards on radiation safety in establishments for medical diagnosis and treatment (Official Standard No. NOM-002-SSA2-1993 of 11 October 1994).

c) Ministry of Labour and Social Security

In relation to its responsibilities *vis-à-vis* workers and the workplace, and in accordance with Articles 26 and 40 of the Law of the Federal Public Administration, the Ministry of Labour and Social Security issued technical standards on 15 June 1994 on health and safety at workplaces where ionising radiation sources are used (see *supra* Article 6 "Radiation Protection").

d) Ministry of the Environment and Natural Resources

Pursuant to Articles 26 and 32 bis of the Law of the Federal Public Administration, this ministry is responsible, *inter alia*, for controlling pollution of the environment. In accordance with the 1988 Environmental Act, applicants for a licence to undertake activities in the nuclear field must first obtain approval from the ministry in addition to the assessment submitted to the National Nuclear Safety and Safeguards Commission.

e) Ministry of Communications and Transport

In accordance with Articles 26 and 36 of the Law of the Federal Public Administration this ministry is responsible for the regulation of public transport. In addition to the licences required by the Ministry of Energy and the National Nuclear Safety and Safeguards Commission, licences for the transport by land of dangerous materials and wastes are issued by this ministry (Official Gazette of 7 April 1993).

2. Public and semi-public agencies

a) National Nuclear Safety and Safeguards Commission

i) Legal status

The National Nuclear Safety and Safeguards Commission (*Comisión Nacional de Seguridad Nuclear y Salvaguardias*) is a semi-autonomous body which operates under the authority of the Ministry of Energy (1984 Act, Article 50).

ii) Responsibilities

The duties and responsibilities of the Commission as defined in the 1984 Act (Article 50) are of very wide scope. In particular, it must:

- Ensure that the regulations and safeguards for nuclear and radiation safety and for physical protection are properly applied in nuclear and radioactive installations.
- Ensure, with the other competent bodies, the proper implementation of international agreements in the field of nuclear and radiological safety, physical protection and safeguards to which Mexico is a party.
- Revise, evaluate and approve the bases for siting, design, construction, operation and decommissioning of nuclear and radioactive installations and propose the relevant regulations; this also applies to the manufacture, handling, storage, reprocessing and transport of nuclear materials and fuels, radioactive materials and equipment containing such materials; and the processing, conditioning, disposal and storage of radioactive waste.
- Provide opinions on the siting, construction, operation etc. of nuclear installations prior to the delivery of a licence by the Ministry of Energy.
- Deliver, renew, amend and suspend licences for radioactive installations.
- Approve the emergency plans prior to the operation of nuclear or radioactive installations. Recommend and advise observance of nuclear and radiological safety measures and safeguards in emergency situations in such installations and close them down where required.
- Establish and maintain the national system for registration and control of nuclear materials and fuels.
- Give its opinion prior to the licensing of imports and exports of radioactive and nuclear materials, nuclear fuels and ionising radiation-emitting equipment.
- Propose, revise and evaluate the regulations for the licensing of facilities for the treatment of radioactive ores.
- Propose regulations governing nuclear and radiological safety, physical protection and safeguards in nuclear and radioactive installations and the safety and safeguards criteria for import and export of nuclear materials and fuels.
- Order and carry out inspections and verifications to ensure that the relevant regulations on nuclear and radiological safety, physical protection and safeguards are complied with.

iii) *Structure*

The Commission is headed by a Director-General appointed by the Minister of Energy and is staffed by the personnel necessary to carry out its tasks.

The Commission also has an Advisory Board chaired by the representative of the Ministry of Energy. The board includes representatives from various ministries (Interior, Foreign Affairs, National Defence, the Navy, Agriculture, Rural Development, Fisheries and Food, Communications and Transportation, Environment and Natural Resources, Health and Labour and Social Security). With the agreement of the chairperson, representatives of other public bodies and experts in the nuclear field may also participate in the work of the Advisory Board.

The board supplies the necessary technical co-operation to advise the Commission.

iv) *Financing*

The Commission is financed from the budget of the Ministry of Energy.

b) *National Nuclear Research Institute*

The 1984 Act on Nuclear Activities also sets forth the status and duties of the National Nuclear Research Institute (*Instituto Nacional de Investigaciones Nucleares*; Articles 41 to 49).

i) *Legal status*

The institute is a decentralised public body under the federal government and it possesses status as a separate legal entity.

ii) *Responsibilities*

The purpose of the institute is to undertake research and development in the field of nuclear science and technology, promote the peaceful uses of nuclear energy and to disseminate any progress made. This work is to be included in the economic, social, scientific and technical development of the country.

To achieve these objectives, the Institute has been assigned the following tasks:

- Carry out and promote activities conducive to scientific and technological development in the nuclear field and to encourage the transfer of scientific knowledge in that area.
- Provide assistance to public and private bodies in the design, construction and operation of nuclear and radioactive installations and, as necessary, in relation to contracts for those services.
- Promote national technological development in the nuclear industry.
- Initiate research and development activities in nuclear science and technology in research institutes and universities.
- Promote the application of radioisotopes in different fields.
- Organise training programmes on the application of nuclear technology.

- With the agreement of the Ministry of Energy, make arrangements with foreign institutes and international organisations to undertake joint projects and information exchange in the field of nuclear science and technology.
- Give its opinion on research and development agreements on nuclear science and technology concluded by the Ministry of Energy and generally advise the federal government in its field of competence.

iii) Structure

The institute is managed by a Board of Directors, a Director-General and a Supervisory Committee.

The Board of Directors is chaired by an Under-Secretary appointed by the Ministry of Energy, and is composed of the Directors-General of the Federal Electricity Commission, the National Science and Technology Council, the National Polytechnic Institute, the Rectors of the National University of Mexico and the National Metropolitan University and two additional persons appointed by the Ministry of Energy. The board members each have an alternate member.

The board, which is the directing body of the institute, has many responsibilities, in particular:

- Approving the internal regulations of the institute.
- Revising and approving the programmes of work.
- Approving the budgets required to implement its programmes, checking the proper use of the economic resources and approving the financial accounts.
- Evaluating the administrative operations and the results obtained, taking into account its own aims and the national objectives.

The Director-General of the institute is appointed by the Ministry of Energy. Amongst others, his main tasks it to:

- Represent the institute in all matters.
- Implement the Board of Directors' decisions.
- Propose the measures required for operation of the institute to the board.
- Establish and propose the programmes of work to the board and submit an annual activity report.

The Supervisory Committee is made up of one representative of the institute, one representative of the Ministry of Energy and one representative of the Treasury. The latter coordinates the committee's activities and is responsible for reporting to the Board of Directors on the results of the committee's work.

The Committee supervises the implementation of the approved programmes and budgets and the measures adopted for efficient management and handling of resources. For this purpose, it may undertake the inspections and audits it deems necessary.

iv) Financing

The institute is financed by donations, federal government and private grants and remuneration for services rendered. It also owns revenue-generating property.

ORGANISATION FOR ECONOMIC CO-OPERATION AND DEVELOPMENT

The OECD is a unique forum where the governments of 30 democracies work together to address the economic, social and environmental challenges of globalisation. The OECD is also at the forefront of efforts to understand and to help governments respond to new developments and concerns, such as corporate governance, the information economy and the challenges of an ageing population. The Organisation provides a setting where governments can compare policy experiences, seek answers to common problems, identify good practice and work to co-ordinate domestic and international policies.

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NUCLEAR ENERGY AGENCY

The OECD Nuclear Energy Agency (NEA) was established on 1st February 1958 under the name of the OEEC European Nuclear Energy Agency. It received its present designation on 20th April 1972, when Japan became its first non-European full member. NEA membership today consists of 28 OECD member countries: Australia, Austria, Belgium, Canada, the Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Japan, Luxembourg, Mexico, the Netherlands, Norway, Portugal, Republic of Korea, the Slovak Republic, Spain, Sweden, Switzerland, Turkey, the United Kingdom and the United States. The Commission of the European Communities also takes part in the work of the Agency.

The mission of the NEA is:

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

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

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

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