ESPAÑA

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

Sixth Spanish National Report

October 2017

This page blank

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

Sixth Spanish National Report

October 2017

This page blank

Table of Contents

Table of Contents

Section A

Introduction

Section A. Introduction

A.1. Executive summary

This document is the Sixth Spanish National Report, in accordance with the provisions of Article 32 of the Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management, signed in Vienna on 5 September 1997.

This Report will be examined at the review meeting of the Contracting Parties provided for in Article 30 of this Convention, which will begin in May 2018. The Ministry of Energy, Tourism and the Digital Agenda (MINETAD), the Nuclear Safety Council (CSN), the Spanish Radioactive Waste Management Agency (ENRESA) and the Spanish Electrical Industry Association (UNESA) have participated in its drafting. This report summarises the main actions implemented from 1 June 2014 up to 1 May 2017, while the information and data contained herein refer to those available as of 31 December 2016 except where expressly stated otherwise.

As a starting point, the Report has been prepared taking into account the IAEA document INFCIRC/604 "Guidelines relating to the form and structure of national reports" adopted by the Contracting Parties in accordance with Article 29 of the Convention.

In an introductory way, section A.2 provides an overview of the national infrastructure for the regulation and management of spent fuel and radioactive waste. Section A.3 briefly summarises the progress since the Fifth National Report, including the pending actions collated in Section K of said Report, those resulting in the commitments assumed by Spain at the fifth review meeting, in reference to the Article of the Report under which they are developed.

Sections A, B, C and D are intended to be self-explanatory, while the rest of the sections deal solely with new developments or actions carried out in order to comply with the Articles of the Convention, referring to the Annexes or previous National Reports in order to avoid duplications. These include additional information on the applicable legislation in the scope of the Convention, the licensing process for nuclear and radioactive facilities, the management of nuclear and radioactive emergencies in Spain, the financing of the activities of the General Radioactive Waste Plan, the third party liability for nuclear damage, actions related to the post-Fukushima National Action Plan or the Synoptic Matrix.

Section K of this Report provides an overview of the process of continuous improvement of safety, based on the explicit identification of the improvement areas underway and planned. This section justifies the commitment of Spain and its institutions to the international community and to the principles of openness and transparency in the field of regulation and safety. Spain complies with the principles and requirements of the Joint Convention, but also addresses certain national practices in a voluntary, original and innovative way, so that it could serve as a

reference to other Contracting Parties to the Convention. The corresponding section of section K suggests some of these strengths of the Spanish national system, such as the inclusion of the most recent regulatory developments and technical requirements already during the design phase of the planned facilities, the coordinated integration of the measures of physical security and safety in them, or advances in the knowledge management and the strengthening of the safety culture in the regulatory body.

From the analysis carried out during the preparation of this Report, it can be affirmed that, while there is always room for improvement, Spain fulfils the objectives, requirements and measures contained in the Joint Convention, and that the necessary infrastructure and experience is available for the safe management of spent fuel and radioactive waste, from the institutional, administrative, technical and economic-financial points of view.

A.2. National System for the spent fuel management and radioactive waste in Spain

The spent fuel managed in Spain comes from seven nuclear reactors in operation, located at five sites, to which we must add the Santa María de Garoña nuclear power plant, shut down since the year 2013, and José Cabrera nuclear power plant, currently in the dismantling phase and the Vandellós1 reactor in the latency phase. These plants are, according to the Convention, nuclear waste management facilities. There exist, moreover, other nuclear facilities in operation: the Juzbado nuclear fuel factory in Salamanca and the Sierra Albarrana solid radioactive waste disposal centre ("El Cabril") in the province of Córdoba. In Madrid, CIEMAT (Research Centre for Energy, Environment and Technology) is currently in the process of dismantling some of its obsolete facilities. Radioactive waste is also produced at close to one thousand hospital, industrial and scientific facilities. Finally, radioactive waste can be generated due to the presence of sources and other radioactive materials at facilities or as part of activities not included in the regulatory system. In Section B.3, the origin of this fuel and waste is described in detail.

The producers of waste are those responsible for the functioning of the facility or economic activity in safe conditions and always in accordance with the provisions of official documents and questions that may affect the conditions of the authorisation or radioactive safety and protection and, in general, comply with the applicable legislation. Similarly, the responsibility for facilities in emergency situations that may arise falls on the producers.

Spain has the necessary infrastructure for the management of spent fuel and radioactive waste, from the institutional, administrative, technical and economic-financial point of view, having established, moreover, the necessary mechanisms to guarantee access to information for citizens and the participation of society.

From the administrative perspective, the legal and regulatory framework for the management of spent fuel and waste is integrated into the general framework regulating nuclear energy in Spain, which is a broad framework, developed in accordance with the development of international regulatory requirements. Within this framework, the responsibilities of different stakeholders are clearly established, as is the distribution of functions between the competent authorities based on the corresponding matters. These functions, while they are exercised separately and independently, are integrated in a coordinated manner through the common administrative framework.

Firstly, insofar as it specifically refers to the spent fuel and radioactive waste management, the definition of national policy falls to the Government through the approval of the General Radioactive Waste Plan (GRWP)[1], according to a proposal from the Ministry of Energy, Tourism and the Digital Agenda (MINETAD). This Plan, which is revised periodically, considers the principal lines of action, the temporal horizon for their implementation and the economic-financial estimates for implementation.

In addition, radioactive waste management, including spent fuel, and the dismantling and closure of nuclear facilities constitute, as per Article 38 bis of Law 25/1964, the Nuclear Energy Act, an essential public service to be provided by the State, entrusting to ENRESA the management of this public service in accordance with the GRWP. What is more, the State shall assume ownership of radioactive waste once it has been definitively disposed of.

On the other hand, the basic procedures of the regulatory framework for nuclear energy, which cover the administrative functions between different authorities, are:

Authorisation Procedure

MINETAD is responsible for the corresponding authorisations for nuclear and radioactive facilities, except Category 2 and 3 radioactive facilities[2] where such competence is transferred to the Governments of the Autonomous Communities[3]. Prior to the granting of any authorisation to a nuclear or radioactive facility, MINETAD must request reports from all authorities with competencies on the matter. With respect to nuclear safety and radiological protection, the report of the Nuclear Safety Council (CSN), in addition to being perceptive, is binding when it is negative, or in terms of the limits and conditions it establishes when it is positive. For its part, it is the responsibility of the Ministry of Agriculture, Fisheries, Food and the Environment (MAPAMA) to issue the Environmental Impact Statement for projects requiring it. In addition, the Autonomous Communities are consulted in relation to spatial planning and the environment.

On the other hand, the CSN is responsible for granting and revoking licences and accreditations for operative staff at nuclear and radioactive facilities and the diplomas of staff of radiation protection technical units who require it. The CSN is also responsible for the granting and revoking of authorisations for Personal Dosimetry Services, Radiation Protection Services and Radiation Protection Technical Units.

Regulatory Procedure

It is a function of the Government to approve the regulatory developments of laws approved by the Parliament, with MINETAD being currently the Ministerial Department responsible for processing and elevating regulatory proposals in the area of nuclear energy. The preparation of regulatory development proposals in the area of nuclear energy is conveniently coordinated between MINETAD and the CSN. In any case, where the proposals refer to issues that may affect nuclear safety or radiation protection, the initiative falls to the CSN, who passes the proposals on to MINETAD to be submitted before the Government.

[1] *http://www.enresa.es/documentos/6PGRR_Espa_ol_Libro_versi_n_indexada.pdf*

[2] *According to the classification of such facilities in the Regulation on Nuclear and Radioactive Facilities approved by Royal Decree 1836/1999 of 3 December.*

[3] *The Spanish State is comprised of seventeen Autonomous Communities plus the Autonomous Cities of Ceuta and Melilla, whose right to autonomy is enshrined in Article 2 of the Spanish Constitution. The general regime of assignments and competencies for the Autonomous Communities is established in Articles 143 and subsequent of the Spanish Constitution and is developed in the respective Statutes of Autonomy of each Community.*

The Nuclear Safety Council is empowered to issue its own regulation through the approval of instructions, which are technical standards in the area of nuclear safety, radiation protection, emergencies and physical protection which are integrated into national legislation, and are binding for those subject to them in the scope of application once notified or published in the Official State Gazette. Their breach is typically categorised as an administrative infraction, sanctionable in accordance with the sanctioning regime established in Law 25/1964 on nuclear energy. It can also issue Complementary Technical Instructions, which are binding administrative acts for those whom they are directed at and are subject to same. Their purpose is to ensure the maintenance of the safety conditions and requirements of facilities and activities and the best compliance with the established requirements in each authorisation. Finally, the CSN issues Circulars and Guides, which are, respectively, non-binding informative technical documents and technical recommendations.

Monitoring and Control Procedure

The review and evaluation of nuclear safety and the radiation protection of nuclear and radioactive facilities, along with its inspection, is the responsibility of the CSN as the only competent authority in the area of nuclear security and radiation protection.

With regard to other matters, such as security, emergency preparedness or environmental impact, the application of this procedure is exercised in a coordinated manner with the other Ministerial Departments that also have competencies in this area.

Sanctioning Procedure

The Directorate General of Energy Policy and Mines of MINETAD is responsible for sanctioning nuclear and radioactive facilities, except for Category 2 and 3 facilities for which this competency has been assigned to the Governments of the Autonomous Communities, along with the elevation of sanction proposals to the sanctioning authority which shall determine the legislation in accordance with the serious nature of the infraction.

When the infractions refer to matters relating to nuclear safety or radiation protection, it shall be the responsibility of the CSN to propose to MINETAD the initiation of the corresponding file. In relation to physical protection, the CSN may also propose the initiation of sanctions for infractions against the nuclear regulatory framework.

The CSN is also legally empowered to, under certain circumstances provided for in the Nuclear Energy Act, propose to MINETAD the initiation of sanctions or, alternatively, issue warnings to holders, dictating the correct measures to be established. If this requirement were not attended to, the CSN may impose fines of a coercive nature in accordance with the provisions to such effects in the legislation.

ENRESA: the National Radioactive Waste and Spent Fuel Management Agency

Article 38 bis of the Nuclear Energy Act tasks the National Radioactive Waste and Spent Fuel Management Agency (ENRESA) with the management of radioactive waste and spent nuclear fuel and the dismantling and closure of nuclear facilities, whose functions are currently regulated by Royal Decree 102/2014 of 21 February for the responsible and safe management of spent nuclear fuel and radioactive waste.

This wholly public funded company was created by Royal Decree in 1984. Its shareholders are CIEMAT, a national research centre dependent on the Ministry of the Economy, Industry and Competitiveness and the State Industrial Ownership Corporation (SEPI), a public law entity dependent on the Ministry of Finance and Public Functions. The tutelage of ENRESA is the re-

sponsibility of MINETAD, through the State Secretariat for Energy, which is responsible for the strategic direction and monitoring and control of actions and plans, both technical and economic.

Among the tasks of ENRESA is also the execution of activities pertaining to management of spent fuel and radioactive waste and the dismantling of nuclear facilities, including preparing drafts of successive General Radioactive Waste Plans, which are subsequently submitted to MINETAD for review and processing before the Government, and the administrative and financial management of the Fund for the financing of the activities of the GRWP, under the supervision of a Monitoring Committee of the Fund and monitored by the competent economic and financial authorities of the State Administration.

In order for ENRESA to perform its activities relating to radioactive waste and spent fuel, the owners of nuclear and radioactive facilities, along with the owners of facilities or activities not subject to the authorisations system in nuclear legislation are obliged to subscribe with ENRESA certain technical-administrative specifications approved by the Ministry of Energy, Tourism and the Digital Agenda, with the previous report of the Nuclear Safety Council, in which the reception conditions for the waste are defined by ENRESA, some of which were already approved in January 2016, replacing the previous "standard contracts" which governed these obligations.

Figure 1 shows the national system for the management of spent fuel and radioactive waste.

A.3. Developments in the area of management of spent nuclear fuel and the management of radioactive waste subsequent to the Fifth National Report

Section K of the Fifth National Report singled out a number of improvements and planned actions in Spain to improve management of radioactive waste and spent fuel. They were the following:

- ✓ The transposition into national law of Directive 2013/59/Euratom of the Council, of 5 December 2013 laying down basic safety standards for protection against the dangers arising from exposure to ionising radiation, and the adoption across the European Union, of a European Directive amending Directive 2009/71/Euratom, establishing the community framework for the nuclear safety of nuclear facilities, as expressed today in Directive 2014/87/Euratom.
- ✓ The continuation of the works pertaining to the licensing and construction of a Centralised Temporary Storage facility for all spent fuel produced by Spanish nuclear power plants.
- ✓ The approval of the Seventh General Radioactive Waste Plan (GRWP).
- ✓ The implementation of actions arising from the National Action Plan (NAcP) post-Fukushima.
- ✓ The effective implementation of the safety culture in the Nuclear Safety Council (CSN).
- ✓ Review of the guidelines, plans and procedures pertaining to nuclear emergencies.

The state of development of these initiatives was updated during the presentation of the Report at the fifth review meeting of the Convention, based on which it was requested that the Sixth An-

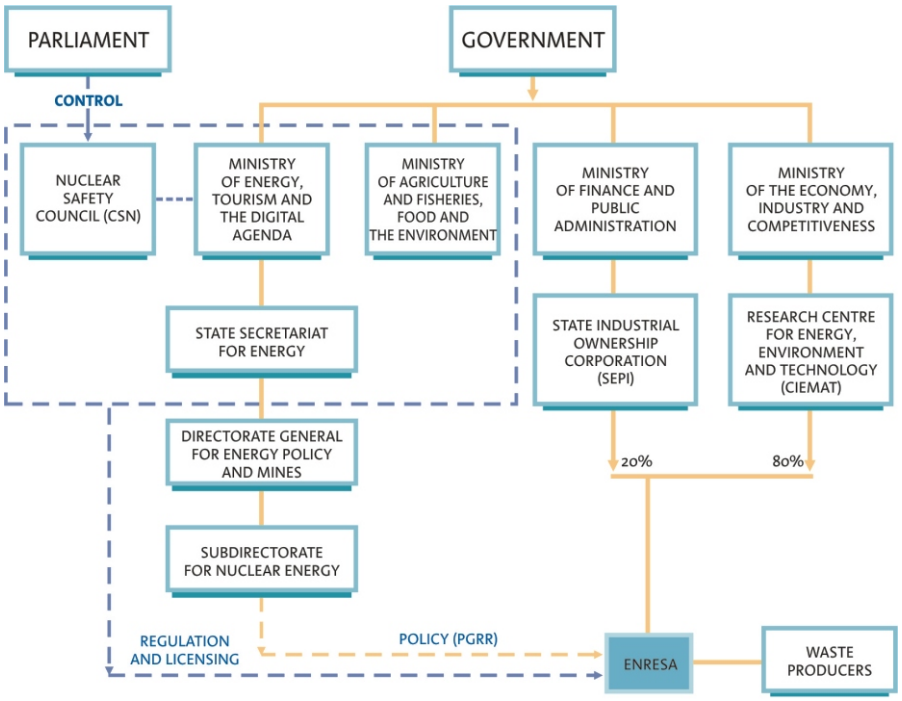


Figure 1: National System

nual Report take into account the advances made in the regulatory development of the rules for the clearance of waste materials and the preparation of a national inventory of radioactive waste.

Although in several different sections of this Report, these matters are dealt with in depth, here we wish to highlight the main advances made in these areas along with other developments in the management of radioactive waste and spent fuel or related matters.

a) Principal regulatory developments of the existing regulatory framework, as shown in Annex A.

i) Directive 2013/59/Euratom of the Council, of 5 December 2013, laying down basic safety standards for protection against the dangers arising from exposure to ionising radiation, is the result of the amendment and redrafting of five previous Directives, which it repealed, establishing the basic safety standards applicable to the protection of the health of persons who have suffered occupational, medical and population exposure against the risks arising from ionising radiation. The Directive shall apply to any situation of planned exposure, existing or as an emergency which imply a risk of exposure that cannot be considered negligible from the perspective of radiological protection in relation to the environment.

In view of its complexity, the Directive established a term of four years for the transposition into domestic legislation, a working group was formed with the participation, along with that of the Nuclear Safety Council, of all of the Ministers with competencies in the area. More detailed information on the transposition of this Directive can be found under Article 19.1 of this report.

ii) Directive 2014/87/Euratom of the Council, of 8 July 2014, amending Directive 2009/71/Euratom, establishing a Community framework for the nuclear safety of nuclear installations has strengthened the European regulatory framework in relation to nuclear safety after the accident at the Fukushima Daiichi nuclear power plant in March 2011. Said Directive established that Member States shall establish and maintain a national legislative, regulatory and organisational framework for the nuclear safety of nuclear facilities, contemplated in the national nuclear safety requirements that cover all the phases of the life cycle of nuclear installations. It requires, furthermore, that all the phases of the life of a facility have the objective of the prevention of accidents and, where these occur, the mitigation of their consequences.

With the aim of incorporating said Directive into domestic legislation, which must be transposed no later than 15 August 2017, a Draft Regulation on the nuclear safety of nuclear facilities is currently being prepared. Additional information on this Draft Regulation may be found below in Article 19.1 of this Report.

iii) Draft Ministerial Order regulating the clearance of waste materials generated in nuclear facilities. The Ministry of Energy, Tourism and the Digital Agenda (MINETAD) is preparing a draft of the *"Order regulating the clearance of waste materials generated in nuclear facilities,"* the aim of which is to establish the necessary criteria for the appropriate management of solid waste material - understood as those which the owner of the facilities intents no use - arising from the nuclear facilities in operation or decommissioning which, due to their low radioactive contamination, can be disposed in conventional ways. More information on the processing of this Draft Order can be found below in Article 19.1 of this Report.

b) Situation of Centralised Temporary Storage (CTS) for spent fuel

The Government approved, by Agreement of the Council of Ministers of 30 December 2011, the designation of Villar de Cañas (Province of Cuenca, belonging to the Autonomous Community of Castilla-La Mancha) as the municipality chosen for the Centralized Temporary Storage of spent fuel and high level waste and the Associated Technology Centre, thus in accordance with the purpose of the proposal of the Commission of Industry, Tourism and Commerce of the Congress of Deputies of April 2006, in which the Government was urged to designate a site and culminating the process of selection of the site, widely detailed in the Fourth Annual Report.

In September 2012, ENRESA acquired the lands where the CTS will be located, and began the characterisation of the site in October 2012. This characterisation of the site will continue until the start-up of the facility. It also began the processes of contracting the engineering companies for the development of the detailed design of the facility.

In accordance with environmental regulations, ENRESA presented, in August 2013, the request for the project to be submitted to the Environmental Impact Assessment (EIA) procedure, along with the corresponding start-up document, with the aim of determining the content and scope of the Environmental Impact Assessment (EIA). This study was presented in May 2014 and submitted to consultation with the entities and organisations affected and public participation for the formulation of the corresponding allegations.

In July 2015, the regional government of the Junta de Castilla-La Mancha began the process of extending the BirdLife Special Protection Area of the Laguna del Hito, some 11 kilometres from the site of the CTS which includes the lands of the CTS in its scope. The State Legal Services appealed this extension. In December 2016, the Su-

preme Court ruled against the extension –as of the date of preparation of this report, the judicial process is unconcluded. These litigations have delayed the publication of the Environmental Impact Statement.

In terms of nuclear regulation, ENRESA presented to MINETAD, in January 2014, the request for the site and construction authorisations for the CTS nuclear facility. At the same time MINETAD requested from the Nuclear Safety Council the relevant report in relation to both requests. The CSN reported favourably on the prior authorisation in July 2015. At present, the CSN is assessing the documentation associated with the construction authorisation. Awaiting the Environmental Impact Statement, ENRESA has continued to carry out various necessary works for the licensing process and for the construction of the facility. Among these are the detailed engineering activities of the facility, complementary characterisation tasks required for the possible concession of the construction license, the additional reports requested for the environmental impact assessment process and the gathering of data and preparation of the pre-operational Environmental Radiological Surveillance Plan.

More detailed information on the CTS licensing procedure and the progress of the works can be found in Articles 6, 7 and 8 of this Report, as can the general licensing procedure in Annex B.

c) Adoption of a Seventh General Radioactive Waste Plan (GRWP).

The Sixth GRWP, currently in force, already contains the strategies and actions to be carried out in the fields of management of radioactive waste and the decommissioning of facilities and the corresponding economic-financial forecasts to achieve them.

However, both the need to update these forecasts and to adapt to the needs of the new Directive 2011/70/Euratom make the adoption of a new Plan on the part of the Government necessary.

In this sense, although the Spanish regulatory framework already required the establishment of a national programme from long before the entry into force of the new Directive (the first GRWP dates to 1987) the adoption of the Seventh GRWP shall comply with this new community framework, adapting it to its requirements and including those aspects that were not explicitly present in the Sixth GRWP, such as concepts or plans for the period subsequent to the useful life of the facilities of the policies or processes of transparency.

In any case, the time it took to form a Government in Spain in 2016 and the delays indicated in the licensing of the CTS have postponed the beginning of the procedure for its adoption. In accordance with the provisions of the Nuclear Energy Act, said Plan will have been approved by the Government on the proposal of MINETAD, subject to the report of the CSN and having consulted the Autonomous Communities in relation to spatial planning and the environment.

d) Actions relating to the post-Fukishima National Action Plan (NAcP)

The accident at the nuclear power plant in Fukishima demonstrated the need to protect nuclear facilities in the face of the risks that can be greater than expected in the design basis of nuclear facilities. Framed within the post-Fukishima National Action Plan NAcP) implemented in Spain, several actions aimed at protecting spent fuel stored at nuclear facilities from these contingencies have been put in place. The safety improvement measures that form part of this plan affect both storage in spent fuel pools and containers located at existing ITSs on the sites of several Spanish nuclear power plants, as described in Annex F of this Report.

e) Culture of safety in the regulating authority

In view of the results of the IRRS (Integrated Regulatory Review Service) missions on international level, the explicit inclusion of the culture of safety in the regulator's integrated management system arose repeatedly as a recommendation. In the period of this report, specific activities in this area have been carried out, aimed at ensuring a robust culture of safety in the Nuclear Safety Council. Thus, in 2016 a multidisciplinary working group was established to prepare a document titled "CSN Policy on Culture of Safety". This document was developed in accordance with the guidelines set out in the Nuclear Energy Agency (NEA) of the OECD's *The Safety Culture of an Effective Nuclear Regulatory Body*, NEA No 7247 OECD 2016, and other international documents of reference, in particular the GSR Part 2 *Leadership and Management for Safety* by the International Atomic Energy Association (IAEA). This document was approved by the Plenary Session of the CSN on 12 January 2017. Work has also been done in preparing an action plan to develop the CSN's policy in this area and that looks at several short and medium-term activities, among them an evaluation of the culture of safety within the CSN.

f) Review of the guidelines, plans and procedures pertaining to nuclear emergencies.

As a result of the lessons learned from Fukishima and the need to transpose Directive 2013/59/Euratom of the European Union of 5/12/2013 into domestic legislation, the Basic Nuclear Emergency Plan (PLABEN) is under review. This review will involve the subsequent review of the External Nuclear Emergency Plans of Spanish nuclear power stations.

In the period of this report the Off-site Emergency Plans (OSEPs) for Spanish nuclear power plants have been reviewed, to include the results of the analysis of the Emergency Response Organisations (EROs) considering a new methodology that takes into account criteria included in various publications of the Nuclear Energy Institute (NEI). In addition, the Internal Emergency Plans of all Spanish nuclear power plants have incorporated a new centre for the management of emergencies (CAGE) and an Emergency Support Centre is provided to supply personnel and equipment to any nuclear power plants that were to suffer a major accident.

g) Finalising of the national radioactive waste inventory.

Since its creation in 1984, ENRESA has prepared, and maintained an inventory of radioactive waste in Spain, based on the data received from producers. Firstly, for the purpose of preparing the first General Radioactive Waste Plan (GRWP), the situation as of 1 January 1986 of the largest producers of radioactive waste and spent fuel was studied.

Royal Decree 102/2014, of 21 January, for the responsible and safe management of nuclear spent fuel and radioactive waste, reaffirms in its Article 9 how one of the functions of ENRESA is the preparation and management of the National Inventory of Spent Fuel and Radioactive Waste, pointing out that it ought to include waste and spent fuel already disposed of, after the closure of the facility at which they were deposited.

In relation to this mandate, in late 2014, ENRESA launched a new internal action plan for a National Inventory of Spent Fuel and Radioactive Waste, updated on 31 December 2015, work which was completed successfully. This Inventory is based on a series of specific reports that study in detail both the quantities and characteristics and provenance of existing waste and spent fuel as of the date, and estimates for fu-

ture generation based on the reference scenarios and hypotheses that consider the uncertainty of future final values.

This National Inventory shall be reviewed every three years. Nevertheless, in the event of any modification of any of the hypotheses considered in the reference scenario or any other requirement, it may be reviewed specifically. A report would also be issued in the first quarter of each year updating the figures of waste generated in each category as of 31 December of the previous year.

h) Advances produced to ensure, in time, additional temporary storage capacity for spent fuel in pools at those nuclear power plants expected to reach saturation.

Until the CTS becomes operational, the Santa María de Garoña, Almaraz and Cofrentes nuclear power plants will need additional storage capacity for spent fuel beyond existing pools, with construction of Individualised Temporary Storage facilities planned for each of the sites, as has already been done at Trillo, José Cabrera and Ascó, licensed in each case as modifications to the design of the facilities.

Additional information on the licensing process, sites, construction and safety assessment may be found under Articles 6, 7 and 8 of this Report.

i) Renewals granted to facilities where spent fuel or radioactive waste is managed.

During the period covered by this Report, renewals have been granted for an additional ten years, for the authorisation for operation of the Trillo nuclear power plant through Order IET/2101/2014 of 3 November, which includes both the spent fuel pool and the ITS located at the same site. Additional information on this renewal can be found under Article 8 of this Report.

In addition, during the same period, ENRESA has built and brought into operation the 2nd of the definitive disposal facilities for Very Low Level Waste (VLLW) at the Sierra Albarrana Storage Centre for solid radioactive waste (El Cabril).

In August 2012 ENRESA submitted for review to the CSN a request for the construction of the 2nd cell, accompanied by the document *"VLLW Storage Cell No. 30 Construction Plan"*. The Plenary Session of the CSN was favourable to the request and gave the go-ahead for construction through its report of 22 January 2014 and its entry into force on 6 July 2016. Cell 30 first began to receive VLLW on 29 July 2016. Additional information on this new cell can be found under Articles 13, 14 and 15 of this Report.

Section B

Policies and Practices

Section B. Policies and Practices

This section covers the obligations provided for in Article 32 Paragraph 1 of the Convention.

> ***Article 32.1.*** *In accordance with the provisions of Article 30, each Contracting Party shall submit a national report to each review meeting of Contracting Parties. This report shall address the measures taken to implement each of the obligations of the Convention. For each Contracting Party the report shall also address its:*
>
> *i. spent fuel management policy;*
>
> *ii. spent fuel management practices;*
>
> *iii. radioactive waste management policy;*
>
> *iv. radioactive waste management practices;*
>
> *v. criteria used to define and categorize radioactive waste.*

B.1. General policy and strategy for the management of radioactive waste and spent fuel

According to the provisions of Article 38 bis of Law 25/1964, of 29 April, the Nuclear Energy Act, the Government shall establish the national policy and programme on radioactive waste management, including spent nuclear fuel and decommissioning and closure of nuclear facilities by means of the General Radioactive Waste Plan (GRWP).

Said Plan must set out, in accordance with Royal Decree 102/2014, of 21 February, for the responsible and safe management of spent nuclear fuel and radioactive waste, the necessary solutions and strategies and technical solutions to be developed in Spain over the short, medium and long term aimed at the responsible and safe management of spent nuclear fuel and radioactive waste, the decommissioning and closure of nuclear facilities and any other activities related to the foregoing, including the economic and financial forecasts and the measures and procedures necessary to implement them.

The Plan is prepared by ENRESA and approved by the Government at the proposal of the Ministry of Energy, Tourism and the Digital Agenda (MINETAD), after the submission of the report by the Nuclear Safety Council (CSN) and having consulted the Autonomous Communities in relation to spatial planning and the environment, industry and social stakeholders, as well as the opinions of the general public through MINETAD's website. Once the Plan is approved, it is submitted to the Cortes Generales (Congress of Deputies and Senate).

In accordance with current regulations, the Plan is periodically reviewed based on the scientific and technical developments, the know-how acquired as well as the recommendations, lessons and good practices resulting from the peer review processes. The Plan is the reference framework for national strategies on the management of spent fuel and radioactive waste.

For the purposes of verifying compliance with the GRWP, ENRESA will prepare and send to MINETAD, which is responsible for the strategic management and follow-up and control of ENRESA's actions and plans, both technical and financial, the following documents:

a) During the first semester of each year, a dossier including all technical and financial aspects regarding the activities of the previous year and the degree of compliance with the relevant budget, as well as an updated economic and financial study on the cost of the activities set out in the GRWP and the adjustment to that cost of the current financial mechanisms.

b) Before 30 November of each year, a technical and financial justification of the annual budget corresponding to the following year at its projection for the following four years.

c) During the month following each calendar quarter, a budgetary follow-up report corresponding to said quarter.

On the other hand, the first quarter of every year, ENRESA will issue to the CSN, which is responsible for the control of the safety of management of spent nuclear fuel and carrying out the evaluations and inspections of the plans, programmes and projects necessary for all phases of said management, the information on the activities developed in the previous year and the forecasts for the current year in relation to that established in the GRWP.

Although the Sixth Plan, approved by the Council of Ministers on 23 June 2006, remains in force, it is foreseeable that ENRESA presents before MINETAD a proposal for the Seventh GRWP, for the purpose of updating its content in accordance with the terms and forecasts relating to the CTS and to adapt it to the requirements of Royal Decree 102/2014 for the responsible and safe management of spent nuclear fuel and radioactive waste, transposing Directive 2011/70/Euratom.

The activities of ENRESA are ordered in Royal Decree 102/2014 and the Fund for the financing of the activities of the GRWP are regulated in the Sixth Additional Provision of Law 54/1997, of 27 November, on the electricity sector, brought into force by Law 24/2013 of 26 December (see Annex D)

B.2. Classification of radioactive waste

The concept of radioactive waste is defined in Article 2 of Law 25/1964, the Nuclear Energy Act:

> *"Radioactive waste is any waste material or product, for which no use is intended, that contains or is contaminated by radionuclides in concentrations or levels of activity above those established by the Ministry of Energy, subject to report of the Nuclear Safety Council"*

Waste in Spain is classified according to the management facilities authorised for a certain volume, radiological inventory and certain limits regarding specific activity concentrations based on the nature of the different radioactive elements in place. In practice, the different facility categories match the radioactive waste classification criteria adopted by the IAEA and the European Commission:

✓ Low and Intermediate Level Waste (LILW) includes waste the activity of which involves the presence of beta- or gamma-emitting radionuclides with a short to medium half life (under 30 years) and whose content in long-life radionuclides is very low and limi-

ted. This group includes waste that can be temporarily stored, processed, conditioned and definitively disposed at the El Cabril Disposal Facility in the province of Córdoba. Very Low Level Waste (VLLW) is also included since it is considered a sub-group of low and intermediate level waste and which, in general, presents specific activities between 1 and 10 becquerel per gram that may also reach several thousands in the case of some low-radiotoxicity radionuclides or in the case of small amounts.

- ✓ High Level Waste (HLW) is waste containing long-life alfa-emitting radionuclides, with semi-disintegration period exceeding 30 years, in remarkable concentration generating heat due to the effects of radioactive disintegration, since they have high specific activity. Its main example is spent fuel (SF) discharged from nuclear reactors which, according to Spanish regulations, is considered waste. It is currently stored in the pools of nuclear power plants and in the Individualised Temporary Storage facilities (ITS) in place at some plants. In the future, it will be stored in the Centralised Temporary Storage facility (CTS) above ground, once in place, and will subsequently be placed in disposal in a Deep Geological Repository (DGR) facility.
- ✓ In addition to these, Special Waste (SW) refers to nuclear fuel attachments, neutron sources, used in-core instrumentation or the components from the reactor vessel system and internal components of the reactor, generally metallic which, due to their radiological features cannot be managed at the El Cabril Disposal Facility. Like long-life and high-activity waste, it means that its storage time and definitive disposal is planned in a manner similar to HLW.

B.3. Generation of spent fuel and radioactive waste

In Spain radioactive waste has been generated and is generated at nuclear facilities and radioactive facilities distributed throughout the territory, as seen in Figure 2.

The inventories to date have been produced by the regular operation of nuclear and radioactive facilities and the development of decommissioning projects at several facilities, including the Vandellós 1 and José Cabrera nuclear power plants and the facilities in disuse included in CIEMAT's PIMIC project, along with radiation incidents caused occasionally at conventional facilities involved in treatment and recycling of scrap metal.

The quantities of spent fuel and radioactive waste generated and managed in Spain to date are detailed below:

TYPE OF WASTE	APPROXIMATE VOLUME (m^3)		
	INVENTORY AS OF 31/12/16	FORECAST GENERATION	TOTAL INVENTORY
VLLW	21,100	89,700	110,800
LILW	39,000	51,400	90,400
SW	200	600	800
SF AND HLW	6,900	2,300	9,200
TOTAL	67,200	144,000	211,200

In Spain, significant quantities of tailings are produced in the uranium mining sector and in manufacturing of concentrates (in the order of 75 million tonnes of tailings from mining and 14 million tonnes of sterile material from processing), with a low radioactivity content that, depending on concentration, may require specific management. In the majority of cases up to now, on-site stabilization has been the preferred management option.

The origins of waste currently produced are:

- ✓ Operation of nuclear power plants (seven reactors plus the Santa María de Garoña nuclear power plant, currently shut down),
- ✓ Operation of the Juzbado fuel element factory (Salamanca),
- ✓ CIEMAT (PIMIC) facility improvement project,
- ✓ Operation of radioactive facilities for industrial, medical, agricultural and research purposes,
- ✓ Operation of the waste disposal facility at El Cabril,
- ✓ Decommissioning of José Cabrera nuclear power station.
- ✓ Occasionally, waste may be generated as a consequence of specific activities (incidents).

In order to calculate waste volumes that, according to estimates, are being generated as a consequence of the operation of the current fleet of nuclear power plants, the current Sixth GRWP considers the following baseline scenario (see Figure 3):

- ✓ Current nuclear power plant fleet with seven operational reactors located across five facilities. The commissioning of new reactors is not under consideration.
- ✓ 40 years of service of operational power nuclear power plants with an operating pace similar to the current one.
- ✓ Open fuel cycle. Reprocessing is not considered.
- ✓ Immediate and complete decommissioning of light water nuclear power plants to be commenced three years after their final shut-down considering a 7-year execution term. In the case of the Vandellós I Nuclear Power Plant, final decommissioning after the latency period considering a 10-year execution period.
- ✓ In terms of the generation of waste, waste generated from the definitive shut-down up to the start of dismantling is encompassed by the operative phase.
- ✓ For small producers, a production similar to the current one until year 2070, which is the period covered by the Sixth GRWP, has been considered.

In accordance with the estimates of 31/12/2016, the total volume of LILW to be managed in Spain, already conditioned and suitable for disposal at the El Cabril disposal facility totals approximately 200,000 m^3. On the other hand, waste to be stored at the CTS would total some 800 m^3 of SW and 9,200 m^3 of spent fuel and HLW. These quantities include 12 m^3 of vitrified High Level Waste and 4 m^3 of Special Waste from the reprocessing of spent nuclear fuel from Vandellós I which is currently being stored in France.

In respect of tailings from mining and production of concentrated uranium, at this time there are no mining facilities in operation in Spain, with some in the restoration phase and others restored. A detailed breakdown of the quantities of sterile and concentrated material from each facility can be found in Section D (inventory).

Figure 2: Location of nuclear reactors and other radioactive waste generating installations.

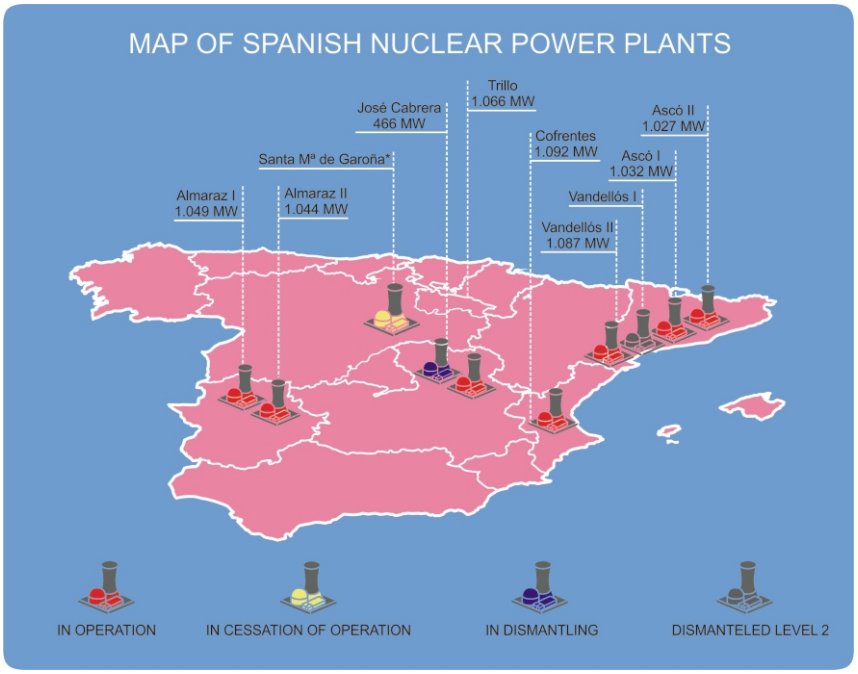


Figure 3: Map of nuclear power plants in Spain.

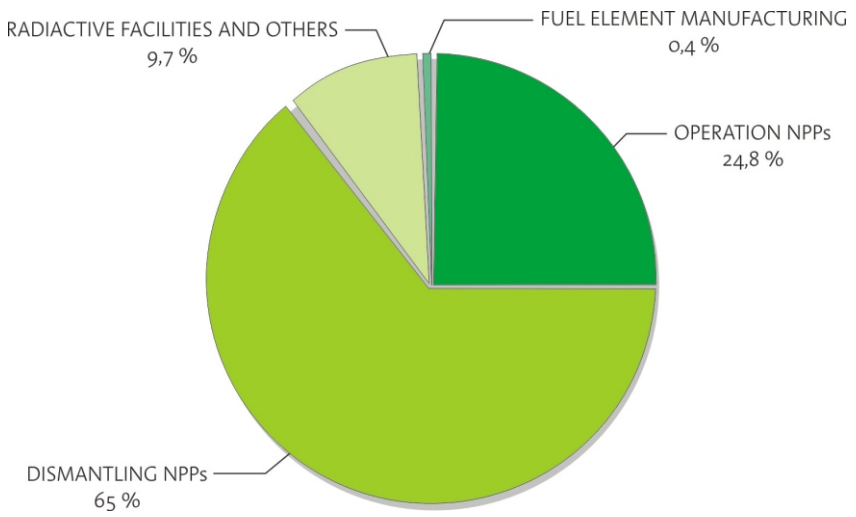


Figure 4: Quantity and origin of LILW to be managed in Spain.

B.4. Spent fuel management policies and practices

The Sixth GRWP, currently in force, like the preceding versions, establishes that, for spent fuel, open cycle management is considered as the basic option.

B.4.1. Temporary storage

The purpose of temporary storage is to provide sufficient capacity to house the spent fuel (SF) generated by Spanish nuclear power plants until a definitive solution is available.

The spent fuel of the light water plants which is generated by the Spanish nuclear power plant fleet is stored in the corresponding pools, as can be seen in Section D1 of this Report. Before the forecast saturation of these, the inventory of which is detailed in Section D2, throughout the decade of the 90s the original pool racks were progressively replaced for other more compact ones, which in most cases has allowed for the need to provide additional storage capacity beyond the pools themselves to be put off significantly.

However, three Spanish nuclear power plants already have Individualised Temporary Storage facilities (ITSs) on site for the dry storage of spent fuel, as an alternative or as complementary to storage in the plant's pools, details of which can be found in sections D1 and D2:

- ✓ The Trillo nuclear power plant was the first, due to the limitations imposed by the intrinsic features of its design, to be fitted with a facility of this type, built on site, where spent fuel is stored in dry metallic casks, in operation since the year 2002.
- ✓ The José Cabrera nuclear power plant, in the dismantling phase since 2010 has, since 2008, had an ITS on site for the storage in casks of 377 spent fuel elements from the plant.
- ✓ Similarly, since April 2013, the Ascó nuclear power plant has had an ITS in operation on site.

Image of the Individualised Temporary Storage at the Trillo nuclear power plant.

The installation of three new individualised dry storage facilities for spent fuel are planned for the Santa María de Garoña, Almaraz and Cofrentes nuclear power plants[4]. As in previous cases, these temporary storage facilities shall be located on the site of the nuclear power plants and, in accordance with the Regulation on Nuclear and Radioactive Facilities, shall be licensed as a modification of same. Other questions related to the site are described below under Article 6, design and construction under 7, and the safety assessment before construction and operation under Article 8 of this Report.

In any case, the basic strategy looked at in the GRWP to provide additional temporary storage capacity for spent fuel is focused on the construction of the Centralised Temporary Storage (CTS) facility, which will house Spent Fuel, High Level Waste (HLW) and Special Waste (SW) based on a dry system. This solution has the following advantages:

- ✓ It allows for management in optimum conditions and in a unified manner for all SF, HLW and SW, while also separating temporary storage from definitive storage.
- ✓ It provides the Spanish management system with greater capacity to manoeuvre in the face of contingencies that may arise in the future, such as the need to dismantle a power plant prematurely.
- ✓ It reduces the number of storage facilities for SF, HLW and SW in Spain and, consequently, the dispersal of nuclear sites throughout the geography of Spain, with the resulting reduction in risks and obligations associated with these facilities. This reduc-

[4] *The Cofrentes nuclear power plant recently lodged a request that the ITS project be submitted to the Environmental Impact Assessment procedure and it is envisaged that, over the coming months, the request for the authorisation for the execution and assembly of same will be presented before MINETAD.*

Image of the Individualised Temporary Storage at the José Cabrera nuclear power plant.

Image of the Individualised Temporary Storage at the Ascó nuclear power plant.

tion would be more significant with the passing of time, and is particularly important insofar as it refers to the physical security of the facility.

- ✓ It allows for the sites of decommissioned nuclear power plants to be made available for other uses, without restrictions.
- ✓ It allows for return clauses for waste and reprocessed SF materials being held abroad to be fulfilled.
- ✓ From an economic perspective, it represents a significant reduction in the cost of the whole HLW and SW temporary management system, compared to the option of storage at each plant and other necessary temporary storage facilities.
- ✓ It allows for the rationalisation and optimisation of the operation and of support services for it.

The licensing process of the CTS is detailed under Articles 6 and 7 of this Report.

Once the CTS is operational, it is expected that all spent fuel currently stored in ITSs will be brought there.

B.4.2. Final Disposal

There exists a broad consensus in the international ambit on the option of disposal of SF and HLW in deep geological formations. In this sense, and in line with Directive 2011/70/Euratom, which recognises that the idea generally accepted by technical experts is that, at present, deep geological disposal is the most sustainable and safest option as the endpoint of management, it is considered that the preferred option is temporary storage followed by a final disposal facility. Additional information can be found under Article 10 of this Report.

B.5. Radioactive waste management policies and practices

As has already been indicated in the introduction to this Report, it is the responsibility of the Government to establish the management policy for radioactive waste, including spent nuclear fuel and the dismantling and closure of nuclear facilities, through the approval of the GRWP. This function of the Government is established by Law, in Article 38 bis of Law 25/1964, the Nuclear Energy Act.

Given that the management of High Level Waste and Special Waste has been addressed in previous sections on SF, in this section reference is only made to the policy for managing Low and Intermediate Level Waste (LILW).

As has been stated in previous National Reports, in Spain, LILW is produced by the operation and dismantling of regulated facilities (nuclear and radioactive) that use radioactive materials or substances. It may also be necessary to manage the waste arising from incidents at facilities that do not require authorisation within the legislative framework for nuclear energy (such as steel mills, material recycling plants, etc.) To attend to these final cases, the appropriate mechanisms to prevent and, where necessary, recover control of radioactive materials where they appear and guarantee their safe management as waste have been planned.

It may be said that Spain has today resolved the overall management of LILW as there is an integrated service, provided with the capacities necessary and configured based on the assigning of responsibilities to a team of well-identified agents who operate in a structured manner.

Within this system, nuclear facilities provided their own capacities for the treatment, and conditioning of LILW in accordance with specifications for the acceptance applied by ENRESA at the El Cabril facility. In the rest of the cases, the producers deliver their waste to ENRESA based on the agreed techniques, and it is ENRESA that carries out the treatment and conditioning tasks necessary at the facilities at El Cabril, as detailed in 16.2.

The El Cabril disposal facility in the province of Córdoba is the axis around which the national LILW management system turns. Its fundamental objective is the definitive disposal of this type of waste in solid form, and also has facilities for treatment and conditioning to process waste from radioactive facilities and that taken from non-regulated facilities. Similarly, the conditioning of all types of LILW in storage units prior to its placement in final disposal cells is carried out. In addition, El Cabril also has laboratories for the characterisation and verification of waste for preparing tests for the better knowledge and acceptance methodology for the different waste streams and for the verification of their characteristics and workshops, laboratories and other auxiliary systems for their operation.

The needs analysis and the accumulated experience in Spain in the management of LILW has allowed us to identify the areas for improvement and define the most suitable activities in order to optimise it. As indicated in the Fourth National Report, the forecasts of the current GRWP consider the generation over the coming years of a considerable volume of radioactive waste of a very low level produced mostly by the dismantling of nuclear facilities. That is why, since 2008 the El Cabril facility has an area specifically available for Very Low Level Waste, consisting of two disposal cells with the capacity for approximately 69,000 m^3, to which another two cells will be added in the future, bringing the total maximum authorised capacity to 130,000 m^3. Both cells are already in operation, as described in Article 13.1.1.

Minimising the generation of waste and its volume, in order to optimise the occupation of the cells, is a constant line of action. In this sense, the policy for the collaboration between ENRESA and the principal producers of waste, participating in joint working groups, developing and using treatment, decontamination and characterisation equipment in different plants and carrying out the projects that allow for the application of technologies and volume reduction, clearance and decontamination equipment.

Among the advances made in the optimisation of volume is the drying of waste, the conditioning of "historic" waste for final disposal, the development of a methodology for the characterisation of large equipment and projects for the clearance of waste.

On the other hand the following lines of action must be pointed out in relation to disposal activities, waste characterisation, methods and techniques for knowledge of the performance of the storage system and safety assessment:

- ✓ Analysis of inventory forecasts and available capacity.
- ✓ Improvements in the techniques of characterisation and measurement of waste packages.
- ✓ Acquisition of information and development of methodological and instrumental improvement to optimise the safety assessment of these facilities.
- ✓ Continuation of studies on the durability of engineering barriers of the disposal system.
- ✓ Continuation of the gathering of data in the test coverings carried out in support of definitive design of the definitive storage coverings.

Image of the LILW disposal cells at El Cabril.

Image of the LILW disposal cells at El Cabril.

- ✓ Study of new configurations of disposal units as a result of the dismantling of installations or the replacement of large components in nuclear facilities.
- ✓ Exchange of information with foreign organisations operating similar facilities.

In relation to the suitability and improvement of the functionalities of the El Cabril facility and the availability of resources for future needs, the principal actions to be carried out are:

- ✓ Update of studies of technical options and security for the disposal of LILW, resulting from the review of the current estimates for the generation of waste.
- ✓ Studies for the design of new LILW disposal cells.
- ✓ The continuation of the support actions for radioactive facilities to optimise "on-site" management of the waste they generate.
- ✓ The provision of new management resources to increase the operational capacity of the VLLW storage.

Section C

Scope of Application

Section C. Scope of Application

This section covers the requirements included in Article 3 of the Convention on the scope of application.

Article 3: Scope of Application

1. *This Convention shall apply to the safety of spent fuel management when the spent fuel results from the operation of civilian nuclear reactors. Spent fuel held at reprocessing facilities as part of a reprocessing activity is not covered in the scope of this Convention unless the Contracting Party declares reprocessing to be part of spent fuel management.*
2. *This Convention shall also apply to the safety of radioactive waste management when the radioactive waste results from civilian applications. However, this Convention shall not apply to waste that contains only naturally occurring radioactive materials and that does not originate from the nuclear fuel cycle, unless it constitutes a disused sealed source or it is declared as radioactive waste for the purposes of this Convention by the Contracting Party.*
3. *This Convention shall not apply to the safety of management of spent fuel or radioactive waste within military or defence programmes, unless declared as spent fuel or radioactive waste for the purposes of this Convention by the Contracting Party. However, this Convention shall apply to the safety of management of spent fuel and radioactive waste from military or defence programmes if and when such materials are transferred permanently to and managed within exclusively civilian programmes.*
4. *This Convention shall also apply to discharges as provided for in Articles 4, 7, 11, 14, 24 and 26.*

The scope of application of the Convention in Spain extends to the following:

- ✓ Spent nuclear fuel originating from the operation of electricity generating nuclear power plants.
- ✓ Radioactive waste originating from the nuclear fuel cycle and radioactive waste originating from the application of radioisotopes in industry, agriculture, research and medicine, or originating as a result of past activities, incidents and accidents involving radioactive materials.
- ✓ Waste material originating from uranium mining facilities and the manufacture of concentrates.
- ✓ Discharges from nuclear and radioactive facilities.

This page blank

Section D

Inventories and Lists

Section D. Inventories and Lists

Article 32. Presentation of reports

(...)

2. *This report shall also include:*

   i) *A list of spent fuel management facilities regulated by this Convention, their location, ultimate purpose and essential characteristics.*

   ii) *An inventory of spent fuel regulated by this convention which is currently in storage and which it has in definitive disposal. This inventory must contain a description of the materials and, where applicable, information on the mass and its total activity;*

   iii) *A list of radioactive waste management facilities regulated by this Convention, their location, ultimate purpose and essential characteristics;*

   iv) *An inventory of radioactive waste regulated by this Convention, which:*

   a. is in storage in radioactive waste management and nuclear fuel cycle facilities;

   b. is in final disposal, or

   c. originates from the above practices.

   This inventory must contain a description of the materials and other pertinent information available, such as volume or mass, activity and specific radionuclides.

   v) *A list of nuclear facilities in the process of closure and the status of closure activities at these facilities.*

D.1. Spent Fuel Management Facilities

Spent nuclear fuel is currently stored in pools at operating nuclear power plants. In addition, the Trillo, José Cabrera and Ascó nuclear power plants have Individualised Temporary dry Storage facilities (ITSs).

At the former, the pool system is complemented by a dry metallic cask storage facility.

- ✓ At the José Cabrera nuclear power plant, after its definitive shut down and the start of tasks preparing for dismantling, the spent fuel was transferred to an independent facility within the same site for dry storage in metal-concrete casks.
- ✓ Finally, Ascó nuclear power plant used this same system to complete its spent fuel storage facility.

These temporary dry storage facilities are located on the same site as the nuclear power plants and are licensed as a modification of the design of same.

Table 1 lists the existing facilities.

Table 1: Existing spent fuel management facilities.

Name of facilities	Location (Province)	Type of storage
Almaraz I nuclear power plant	Cáceres	Pool
Almaraz II nuclear power plant	Cáceres	Pool
Vandellós II nuclear power plant	Tarragona	Pool
Ascó I nuclear power plant	Tarragona	Pool
		Dry storage
Ascó II nuclear power plant	Tarragona	Pool
		Dry storage
Cofrentes nuclear power plant	Valencia	Pool
Santa María de Garoña nuclear power plant	Burgos	Pool
Trillo nuclear power plant	Guadalajara	Pool
		Dry storage
José Cabrera nuclear power plant	Guadalajara	Dry storage

Pools

The storage pools at the Trillo and Santa María de Garoña nuclear power plants are located in the reactor building. At the other operating nuclear power plants, the pools are located in a building adjacent to that one, with both connected by a transfer canal. Where there are two reactors on the same site, as in the case of Almaraz and Ascó, each group at the plant has its own pool. In the case of the Cofrentes nuclear power plant, there is also a pool in the reactor building used for temporary storage of fuel during recharging periods.

The spent fuel storage pools, whose initial capacity was increased through changing the racks for other higher-density ones, have a reserve to house a complete reactor nucleus, if necessary, this being a requirement for the operation of nuclear power plants.

Spent fuel dry storage (Trillo, José Cabrera and Ascó I and II nuclear power plants)

✓ Trillo nuclear power plant

The cask storage at Trillo nuclear power plant has been operating since mid-2002. It is a unit with a rectangular floor surface with a capacity to house up to 80 ENSA-DPT type casks, of which there are already 32 in storage. The ENSA-DPT cask, type metallic, has been redesigned to safely store and transport 21 PWR 16 x 16-20 fuel elements of a light water reactor type Kraftwerk Union (KWU). Its design complies with the requirements of 10 CFR 72, the IAEA's regulation for the safe transport of radioactive materials and the Spanish transport regulation.

Image of the transfer cask in the fuel building at Ascó.

In the period covered by this report, the most important new activities related to several assessments of the design of the ITS to verify that everything remains functioning once the DPT casks have been replaced with the ENUN 32P model.

✓ José Cabrera nuclear power plant

The José Cabrera nuclear power plant was definitively shut down in April 2006. The alternative chosen was its total immediate dismantling so that the site remains completely free to be used for another use, with no restriction. As a prior step, the spent fuel stored in the pool was transferred to a local dry storage facility built on the site of the plant itself. A description is provided in the previous National Report.

Since its start up in 2008, the ITS at the plant, which stores all SF generated during the operation of this facility in 12 casks, is being operated on a routine basis.

✓ Ascó nuclear power plant

Taking into account, on the one hand, the period required for the licensing and construction of the ITS facility, and on the other, the period forecast for saturation to be reached for the pools of the two groups at Ascó nuclear power plant, it was deemed necessary to construct a dry ITS to store the spent fuel produced at the plant until the time comes when the fuel can be transported to the CTS.

The chosen system, similar to the one used in the ITS facility at José Cabrera, consists of three different components: a multi-purpose metallic capsule with capacity for 32 fuel elements that constitute a hermetic confinement barrier, a storage module (concrete-steel hybrid) in which the capsule is housed for long-term storage and a transfer cask used for cask loading, unloading and transfer operations. The system is com-

pleted with the transport cask envisaged for the future transport of the loaded capsule to the facility where the next phase of its management will take place.

The ITS consists of two storage slabs with seismic resistance, one for each group, in which up to 32 storage casks are placed for a total of 1,024 fuel elements. This is the outdoor facility connected to the groups at the plant via an access way that provides the route for the transfer of loaded storage modules by a special purpose-built vehicle. The licensing of this ITS facility was completed in April 2013 and is currently in operation since May of that year, with 11 casks.

D.2. SF Inventory (elements and U mass)

The total quantities of spent fuel in existence in Spain as of 31 December 2016 are displayed in Table 2.

Table 2: Spent nuclear fuel in existence in Spain (31 December 2016).

Name of facility	Characteristics of fuel elements	Capacity of total/reserve nucleus (no. of elements)	Stored SF (no. of elements)	Stored SF (tU)
Almaraz I nuclear power plant	PWR 17x17	1,804/157	1,456	672
Almaraz II nuclear power plant	PWR 17x17	1,804/157	1,440	664
Vandellós II nuclear power plant	PWR 17x17	1,594/157	1,212	550
Ascó I nuclear power plant	PWR 17x17	1,421/157	1,164	533
		ITS with capacity for 16 casks of 32 elements each	192	86
Ascó II nuclear power plant	PWR 17x17	1,421/157	1,168	535
		ITS with capacity for 16 casks of 32 elements each	160	72
Cofrentes nuclear power plant	BWR 8x8, 9x9	5,404/624	4,232	768
Santa María de Garoña nuclear power plant	BWR 8x8, 9x9	2,609/400	2,505	440
José Cabrera nuclear power plant	PWR 14x14	ITS with capacity for 12 casks of 32 elements each	377 (12 casks)	100
Trillo nuclear power plant	PWR 16x16	805/177	504	238
		ITS with capacity for 80 casks of 21 elements each	672	317

Image of the removal of the loaded cask from the Ascó fuel building

D.3. List of radioactive waste management facilities

The Joint Convention, in its Article 2, defines "radioactive waste management facility" as follows:

> *"any facility or installation the primary purpose of which is radioactive waste management, including a nuclear facility in the process of being decommissioned only if it is designated by the Contracting Party as a radioactive waste management facility."*

Based on this definition, "small producers" are not included within the scope of this list of facilities, as their radioactive waste is collected and processed by ENRESA at the El Cabril facility. Therefore, the radioactive waste management facilities are the following:

- ✓ Nuclear power plants in operation

  All nuclear power plants have treatment facilities for their liquid waste and conditioning facilities for solids - pre-compacting and immobilisation.

  There also exist temporary storage facilities at every plant to house waste before it is transported to the LILW El Cabril disposal facility.

- ✓ Vandellós I nuclear power plant in dismantling phase

  There is a facility installed in the cellar of the reactor building for temporary storage of Low and Intermediate Level Waste during the dismantling process, as an intermediate and specific solution for the graphite waste originating from the sleeves of the fuel elements.

✓ José Cabrera nuclear power plant in dismantling phase

The plant has treatment facilities for liquid waste and solid waste which have remained in use after the shutdown of operation of the plant. The waste resulting from some decontamination tasks, currently under way is treated at these facilities and is temporarily managed at the plant before being dispatched to El Cabril.

During 2016, a new facility was brought into operation for the treatment and decontamination of dismantling waste using chemical and mechanical means in order to reclassify certain LILW as VLLW.

✓ Juzbado fuel factory

Like the nuclear power plants, it has a liquid waste treatment plant for drying and immobilising with cement. For the pre-conditioning of solid waste, pre-compacting is used and for the final conditioning, immobilisation in cement is the method employed. The temporary storage facility serves as an intermediate phase before the transport of waste to El Cabril.

✓ CIEMAT (temporary processing and storage facilities)

The Research Centre for Energy, Environment and Technology (CIEMAT) has authorisation to carry out conditioning activities on solid Low and Intermediate Level Waste generated at its Centre, and to provisionally store other radioactive material within transport packaging which complies with the requirements established by national regulation on the transport of dangerous goods by road.

CIEMAT treats and conditions waste originating from research activities at the Centre which are fundamentally related to the developments for radioactive waste management, monitoring of materials and other activities that involve the use of radioactive tracers and materials.

Image of the soils treatment plant at the José Cabrera nuclear power plant.

During the period covered by the Sixth National Report, CIEMAT has extended its temporary storage capacity in order to store Very Low Level Waste and cleared materials originating from the PIMIC Rehabilitation Project (see Section D.5) through the authorisation for use of pre-existing buildings that have been conditioned for this purpose.

✓ Definitive disposal centre for Low and Intermediate Level Waste at El Cabril

The El Cabril disposal facility has systems for the treatment and conditioning of solid and liquid waste. These systems are destined for the treatment and conditioning of all waste needed before final disposal at the facility. In accordance with the system of responsibilities established in the GRWP, most waste treated and conditioned at El Cabril originates from radioactive facilities or are generated by the facility itself, although the Centre does have the systems necessary for final conditioning of waste originating from nuclear facilities, prior to final disposal in storage cells.

A) Low and Intermediate Level Waste (LILW)

➪ Treatment and conditioning of waste at radioactive facilities.

Waste produced by small producers (radioactive facilities for industrial, medical, agricultural, and investigative purposes) are segregated by these at their facilities and subsequently transported to El Cabril. The transfer of waste is carried out in accordance with an agreement for removal between the producer and ENRESA and which corresponds to the categories of waste established by MINETAD. The treatment of the different type of waste at the El Cabril facility is carried out in a manner that minimises the production of secondary waste, obtaining conditioned packages that comply with the conditions required for subsequent incorporation in storage units.

The conditioning building at El Cabril has a specific area for the treatment and conditioning of waste from small producers in accordance with the provisions of the Fourth National Report.

➪ Final conditioning of waste from large producers.

Large producers (nuclear power plants and fuel element factories) must condition their LILW in packages that meet the acceptance criteria of ENRESA for transport to El Cabril in a manner that, for the most part, does not require further treatment processes.

There is also a second category comprised of packages that have been pre-compacted at source due to their physical characteristics. The El Cabril facility has a drum compactor with a capacity of 1200 t.

In both cases, packages are conditioned in disposal units.

➪ Temporary Storage at El Cabril

El Cabril has three facilities in total used for the temporary storage of solid waste: the "modules," the reception building and the warehouse for radioactive sources and materials.

The first are three buildings built during the 1980s for the long-term temporary storage of waste. Each of them has a nominal capacity of 5,000 220 litre drums.

At present, the process of identification of packages produced before 1992 continues for, once compliance with acceptance criteria is verified, transfer to the storage cells. Additionally, these facilities are used to house heterogeneous and special waste pending further treatment for final disposal.

The temporary reception building, located within the El Cabril facility, has an area for buffer storage of LILW packages.

The new warehouse for radioactive sources and material has allowed for the integration and safeguarding on a single physical site which requires singular management.

➪ Final disposal at El Cabril

The disposal system for Low and Intermediate Level Waste at El Cabril is of a near-surface type in cells and has 28 of these with a capacity of 320 positions per cell, for CE-2A type disposal units.

The additional waste packages are transferred to storage units that, when filled, are transported to the disposal platform and placed within the cells.

B) Very Low Level Waste (VLLW)

Since 2008, the El Cabril facility has a specific disposal area for Very Low Level Waste (VLLW) comprised of two cells with a total capacity of approximately 69,000 m^3. Each cell consists of an excavated area upon which a series of layers of drainage and impermeable material to impede the dispersion of possible leachates in between have been placed. In the future, construction of another two cells is planned to reach the authorised capacity of 130,000 m^3. Thus, contaminated materials originating from the dismantling of facilities and whose specific activity is hundreds of times less than LILW currently stored in the other area of El Cabril can be disposed of.

VLLW arrives at El Cabril in drums, sacks or metallic containers and is sent directly to the cell or received temporarily at the Technology Building. This building has an inertization system to stabilise material.

Table 3 contains a list of the radioactive waste management facilities, including their location, purpose and major characteristics.

D.4. Radioactive waste temporary storage or final disposal inventory

Table 4 shows the radioactive waste inventory as of 31 December 2016.

D.5. Facilities in decommissioning phase

✓ Vandellós 1 NPP

Vandellós 1 nuclear power plant operated from 1972 until October 1989 when an accident occurred in its conventional zone. This power plant was based on French technology, the only graphite-gas type one in Spain. After the definitive suspension of its operating license, the then Ministry of Industry and Energy accepted the option to dismantle, proposed by ENRESA. The Plan consisted of the partial dismantling of the facility to IAEA Level 2 (partial dismantling) followed by a latency period of some 25 years before total dismantling or IAEA Level 3.

Detail of containers (disposal units) for the disposal of LILW in the storage cell at El Cabril.

Image of the interior of the VLLW disposal cell at El Cabril.

Table 3: Radioactive waste management facilities.

Name of facility	Location (Province)	Principal purpose	Other characteristics
Almaraz I nuclear power plant	Cáceres	Treatment, prior conditioning and temporary storage	Facilities for the management of own waste generated by the operation of each of the nuclear power plant
Almaraz II nuclear power plant	Cáceres	Treatment, prior conditioning and temporary storage	
Vandellós II nuclear power plant	Tarragona	Treatment, prior conditioning and temporary storage	
Ascó I nuclear power plant	Tarragona	Treatment, prior conditioning and temporary storage	
Ascó II nuclear power plant	Tarragona	Treatment, prior conditioning and temporary storage	
Cofrentes nuclear power plant	Valencia	Treatment, prior conditioning and temporary storage	
Santa María de Garoña nuclear power plant	Burgos	Treatment, prior conditioning and temporary storage	
Trillo nuclear power plant	Guadalajara	Treatment, prior conditioning and temporary storage	
José Cabrera nuclear power plant	Guadalajara	Treatment, prior conditioning and temporary storage	
Vandellós I nuclear power plant	Tarragona	Temporary storage	Facilities for storage of part of the waste originating from the decommissioning of the plant
Juzbado factory	Salamanca	Treatment, prior conditioning and temporary storage	Facilities for the management of technological waste from operation of the plant
CIEMAT	Madrid	Prior conditioning and temporary storage	Facilities within the nuclear research centre
El Cabril	Córdoba	Temporary storage	3 concrete modules and temporary reception building
		Final disposal	28 reinforced concrete cells near the surface for LILW
			2 trench cells for VLLW

Table 4: Radioactive waste inventory.

Name of facility	Type of facility	Type of waste	Volume (m^3)
Almaraz I-II NPP	NPP	VLLW	509
		LILW	1,312
Vandellós II NPP	NPP	VLLW	164
		LILW	263
Ascó I-II NPP	NPP	VLLW	563
		LILW	643
Cofrentes NPP	NPP	VLLW	872
		LILW	1,114
Santa María de Garoña NPP	NPP	VLLW	180
		LILW	736
Trillo NPP	NPP	VLLW	93
		LILW	75
José Cabrera NPP	NPP	VLLW	674
		LILW	33
		SW	31
Vandellós NPP	NPP	VLLW	909
		LILW	1,572
		SW	154
Juzbado factory	Fuel element factory	VLLW	269
		LILW	86
CIEMAT	Research centre	VLLW	2,875
		LILW	2
El Cabril	Temporary storage	VLLW	3,912
		LILW	1,000
	Final disposal	VLLW	10,087
		LILW	32,198

Image of Vandellós 1 nuclear power plant in dismantling phase. It is currently in the latency phase.

Although the Level 2 dismantling project ended in June 2003, it was not until January 2005 that the latency phase formally began, after the corresponding Ministerial Order was issued on the part of the Directorate General of Energy Policy and Mines. During this period, monitoring and control activities are carried out which, after the established waiting period, will allow for the complete dismantling of the facility and site to be duly undertaken.

✓ José Cabrera NPP

The José Cabrera nuclear power plant ceased operating in April 2006 after the decision of the authorities not to renew its license. It is a pressurised water reactor (PWR) of reduced power (160 MW) plant. It was the first nuclear power plant to operate in Spain, having begun operations in 1968.

As already indicated in the Fifth National Report, ENRESA became the licensee of the facility for dismantling by the Ministerial Order of 1 February 2010.

In accordance with the strategy set by the Sixth GRWP, the plant is being dismantled, applying the IAEA strategy for immediate and complete dismantling for the purposes of freeing up the site for other uses.

As has been indicated in the previous section, spent fuel is currently stored at an ITS facility on the site of the plant.

✓ CIEMAT facilities

The Integrated Plan for the Improvement of CIEMAT Facilities (PIMIC) consists of the dismantling of some obsolete facilities for which no future use is planned and better use of free spaces to develop other activities. The Plan is controlled and super-

vised by the CSN and MINETAD. During its execution, CIEMAT maintains responsibility as the licensee of the facility and provides the necessary support.

The PIMIC project began with the tasks involved in preparing the site, including the auxiliary facilities necessary for the execution of dismantling and rehabilitation facilities. During the 2014-2016 period, decontamination, declassification and restoration activities were maintained at different facilities and sites.

Table 5: Facilities in dismantling phase.

Programme	Name	Location	Status	Execution
Vandellós I NPP dismantling project	Vandellós I	Vandellós, (Tarragona)	Latency (Level 2 dismantling)	1998-2004
José Cabrera I NPP dismantling project	José Cabrera	Zorita de los Canes (Guadalajara)	Execution of dismantling and closure	2010-2018
Integrated plan for the improvement of CIEMAT facilities (PIMIC)	CIEMAT	Madrid	In progress	
Dismantling and restoration plan for the Saelices el Chico facilities (Salamanca)	Quercus	Saelices el Chico (Salamanca)	Request for authorisation to dismantle on 14 September 2015	Will begin once authorisation has been granted for dismantling and closure
	Elefante		Dismantled Currently in supervision and compliance phase	2001-2004
	Mining facilities		Restored	2004-2008
Compliance period of Andújar Uranium Factory (FUA)	FUA	Andújar (Jaén)	Dismantled Currently in supervision and compliance phase	1991-1995

✓ The Quercus uranium concentrate factory, Saelices el Chico (Salamanca)

Since the ministerial order declaring its definitive shut-down in the year 2003, this factory has been in shut-down phase. At the present time, activities at the facility are concerned with treatment of liquid effluents for the conditioning and discharge, with no production of uranium concentrates.

In the year 2005, the National Uranium Company (ENUSA) as licensee of the plant, requested authorisation to proceed with its dismantling from the then Ministry of Industry, Tourism and Commerce.

Subsequently, ENUSA decided to postpone its decision to dismantle the plant with a view to possibly resuming operations, given the evolution of the prices of uranium concentrates, requesting a *sine die* suspension of the dismantling license. Through successive Resolutions of the Directorate General of Energy Policy and Mines and previous CSN reports, the temporary suspension of said process has been delayed and until, by virtue of the Resolution of the Directorate General of Energy Policy and Mines of 30

October 2012, ENUSA Industrias Avanzadas S.A., licensee of said facility, was required to present a request for authorisation to dismantle, which ENUSA presented on 30 October 2013.

However, said request was replaced by the dismantling and closure request presented by ENUSA on 14 September 2015 in accordance with the modifications introduced based on the entry into force of Royal Decree 102/2014 for the responsible and safe management of spent nuclear fuel and radioactive waste, a request which is currently being assessed by the CSN.

Given the circumstances of the Quercus plant site shared with the Elefante plant site (old concentrate factory already dismantled and in the monitoring and compliance phase) and the Saelices el Chico mining facility (restored between the years 2004 and 2008), the dismantling of the Quercus plant must be completed in phases, given that certain structures, systems and facilities must be maintained operative for the management, treatment and conditioning of the waters generated on site.

✓ Andújar Uranium Factory (FUA)

Monitoring tasks are maintained on the site of the Andújar Uranium Factory (FUA), in accordance with the conditions established by the CSN, contained in the Resolution of the Ministry of Industry and Energy of 17 March 1995.

D.6. Decommissioned facilities

In the period between the Fifth Annual Report and this one, no declarations have been made on the decommissioning of any facility, meaning the situation regarding the decommissioning of facilities is the same as that in the Fifth Annual Report.

Section E

Legislative and Regulatory System

Section E. Legislative and Regulatory System

Article 18
Implementing Measures

Article 18. Implementing Measures

Each Contracting Party shall adopt, within the scope of their national legislation, the legislative, regulatory and administrative measures, and any others necessary to comply with the obligations arising from this Convention.

Spain has the legislative, regulatory and administrative framework necessary to comply with the obligations arising from this Convention. The Ministry of Energy, Tourism and the Digital Agenda (MINETAD) and the Nuclear Safety Council (CSN) both continue to work within the scope of their competencies on the continued improvement of the regulatory development of aspects related to waste and spent fuel management.

Consideration is given in such development to the applicable national standards, to international experience and standards, in particular to analysis of the applicability of the IAEA programme of standards for safe waste management, and to all those elements that, while not reflected in the legislation, have allowed aspects ensuing in the authorisations granted to date for radioactive waste management to be addressed successfully.

Article 19
Legislative and Regulatory Framework

Article 19. Legislative and Regulatory Framework

1. *Each Contracting Party shall establish and maintain a legislative and regulatory framework that will govern the safety of spent fuel and radioactive waste management.*
2. *This legal and regulatory framework shall consider the implementation of:*
   - *(i) The applicable national requirements and provisions in relation to radiation safety;*
   - *(ii) A system for providing licenses for spent fuel and radioactive waste management activities;*

(iii) A system of prohibition of the management of spent fuel and radioactive waste without the corresponding license;

(iv) An appropriate regulatory institutional control, regulatory inspection and documentation, presentation of reports;

(v) The measures to ensure compliance with the applicable regulation and the conditions of the licenses;

(vi) A clearly defined assignment of responsibilities to the bodies involved in the different phases of spent fuel and radioactive waste management.

3. *When the Contracting Parties consider regulating radioactive materials as radioactive waste, the Contracting Parties must take into account the objectives of this Convention.*

The legislative and regulatory framework governing the safety of RW and SF management is comprised of a body of legislation consisting of laws, regulations and Safety Instructions (the latter issued by the Nuclear Safety Council), a breakdown of which is provided in Annex A and the main changes to which are discussed in Articles19.1 and 19.2. There were no significant changes to the authorisations (detailed in Annex B), inspections or sanction regimes or in the assignment of responsibilities (detailed in Article 19.3).

19.1. New changes to the principal legislative and regulatory provisions for spent fuel and radioactive waste management

This section describes new changes already made or in progress in the regulatory provisions, ranging from laws to regulations in the area of spent fuel and radioactive waste management.

i) Transposition of Directive 2013/59/Euratom, of 5 December 2013, laying down basic safety standards for protection against the dangers arising from exposure to ionising radiation and repealing Directives 89/618/Euratom, 90/641/Euratom, 96/29/Euratom, 97/43/Euratom and 2003/122/Euratom[5].

This Directive repeals five previous Directives on this matter to bring together in a single community legal instrument the basic regulation for basic occupational, medical and public radiation protection. It applies to any planned, existing or emergency exposure situation which implies a risk of exposure to ionising radiation. It establishes dosage limits taking into account the general principles of radiation protection. It also covers exposure due to natural radiation (including NORM and Radon) and establishes requirements for information, training and education in the area of radiation protection. Similarly, it establishes provisions for Member States to adopt measures to improve general awareness of the existence and danger of orphan sources and how to ensure

[5] *Directive 89/618/Euratom on informing the general public about health protection measures to be applied and steps to be taken in the event of a radiological emergency.*

Directive 90/641/Euratom on the operational protection of outside workers exposed to the risk of ionising radiation during their activities in controlled areas.

Directive 96/29/Euratom laying down basic safety standards for the protection of the health of workers and the general public against the dangers arising from ionising radiation.

Directive 97/43/Euratom on health protection of individuals against the dangers of ionising radiation in relation to medical exposure, and repealing Directive 84/466/Euratom.

Directive 2003/122/Euratom on the control of high-activity sealed radioactive sources and orphan sources.

there are systems for recovery, management and control. Given the wide area regulated by this Directive, the term for transposition is fixed at 4 years.

In view of the diversity of the area covered by this new Directive, the competencies of different ministries, we have opted for the creation of an inter-ministerial coordination group comprised of the Ministry of Energy, Tourism and the Digital Agenda (MINETAD), and the Ministries responsible for Health, Employment, Development and Home Affairs, and the CSN, with each ministry responsible for providing an amendment text or ex-novo text that clearly incorporates the Directive into Spanish legislation.

ii) Transposition of Directive 2014/87/Euratom of the Council, of 8 July 2014, amending Directive 2009/71/Euratom, establishing a Community framework for the nuclear safety of nuclear installations.

Council Directive 2014/87/Euratom of 8 July 2014 amending Directive 2009/71/Euratom establishing a Community framework for the nuclear safety of nuclear installations has strengthened the European regulatory framework around nuclear safety in light of the accident at the Fukushima Daiichi nuclear power plant in March 2011.

According to Article 4.1.b of said Directive, Member States shall establish and maintain a national legislative, regulatory and organisational framework for the nuclear safety of nuclear facilities, contemplated in the national nuclear security requirements that cover all the phases of the life cycle of nuclear installations.

In the Spanish case, Law 25/1964, of 29 April, the Nuclear Energy Act, constitutes the legal framework establishing the basic principles and requirements in the nuclear safety of these facilities, while Law 15/1980, of 22 April, creating the Nuclear Safety Council, establishes this body as the only competent authority in this area in Spain. The CSN has been developing and regulating the nuclear safety of the nuclear facilities through the different binding Instructions.

The existence of this legal framework, along with the regulatory framework constituted by the Regulation on nuclear and radioactive facilities, ensured that at the time the transposition of Directive 2009/71/Euratom, which is now amended in significant aspects by Directive 2014/87/Euratom, was not necessary.

In this sense, the latter Directive establishes all the phases in the life of a facility for the purpose of preventing accidents and, where one does occur, the mitigation of their consequences and avoiding: a) early radiation emissions which will need emergency measures off-site but without the time to apply them and b) major radiation emissions that will need protection measures for the population that would not be limited in time or space. This safety objective must be demanded from new facilities and be considered a reference for the implementation of improvements in the case of existing facilities.

Similarly, the new Directive has introduced other changes with respect to the previous one, both in the framework and in the regulatory authority, reinforcing aspects such as effective independence, suitable availability of human and financial resources, transparency and the prevention of conflicts of interest, among others.

In addition, it establishes notable requirements for licensees, as non-delegable responsibility, the strengthening of the processes entailed in the safety demonstration (licensing processes and periodic safety review), a management system geared towards safety, the strengthening of the culture of safety, the strengthening of structures and the necessary resources for the emergency management on-site and coordination

for external management, the availability of the appropriate financial and human resources, the qualifications of employed staff and subcontracted staff, training, strengthening the concept of defence in depth or the emphasis on early notification of events.

Insofar as it refers to Member States, the Directive maintains the obligation established in Directive 2009/71/Euratom to complete a self-assessment at least once every 10 years, a national framework and competent regulatory authorities self-assessment, inviting an international peer review in these areas for the purpose of constantly improving nuclear safety and adding the obligation to carry out peer review of a "specific aspect related to safety," at least once every six years, and also provided that an accident causes situations that require emergency measures off-site.

In any case, although the Spanish regulatory framework, to a large extent already includes the different requirements of Directive 2014/87/Euratom, there was no specific standard of a regulatory nature on nuclear safety, while there has been regulation in the form of royal decrees in other areas of the sector, such as radiation protection (by means of the Regulation of the Protection of Health Against Ionising Radiations approved by RD 783/2001), management of radioactive waste (RD 102/2014 for the Responsible Management of Radioactive Waste and Spent Nuclear Fuel), physical protection (approved by RD 1308/2011 on the Physical Protection of Nuclear Facilities and Materials and Radiation Sources) and the licensing processes of said facilities (Nuclear and Radioactive Facilities Regulation, approved by RD 1836/1999).

Moreover, some aspects of the Directive not provided for in our judicial system have been identified, which are considered necessary to transpose, incorporating along with several other procedures other than the CSN Instructions, thus obtaining a unified text with the range of royal decree.

The starting point for the preparation of this project was CSN Instruction IS-26 on the basic principles of nuclear safety applicable to nuclear facilities of 16 June 2010, which, currently, is one of the regulations which transposed Directive 2009/71/Euratom.

The project cited above was prepared by a working group made up of representatives of MINETAD and the CSN, with a date of 21 September 2016, the Plenary Session of the Nuclear Safety Council agreed to take stock of the text and its forwarding to MINETAD, which began its processing on 26 September 2016.

On 20 December 2016 the proposal was published on the MINETAD website and subsequently submitted to hearing procedures for those interested and for public participation, which were concluded in March 2017.

iii) Draft Ministerial Order regulating the de-classification of the waste materials generated in nuclear facilities.

Council Directive 2013/59/Euratom of 5 December 2013 laying down basic safety standards for protection against the dangers arising from exposure to ionising radiation considers the declassification of waste materials and defines the radiological criteria that ought to govern the process of authorisation that must govern the process of elimination, recycling and re-use.

In accordance with the Directive, the CSN has submitted a proposal to MINETAD for the project *"Order regulating the clearance of the waste materials generated in nuclear facilities,"* the aim of which is to establish the necessary criteria for the appropriate management of solid waste material - understood as that for which the licensee of the facilities intends no use - arising from the nuclear facilities in operation or decommis-

sioning which, due to their low radioactive contamination, can be stored in conventional ways.

As forecast in the Order Project, before beginning the clearance process, the licensee of the facility must present to the CSN a test plan for the radiological characterisation of the waste materials and a calendar of execution. The results of the Plan must be submitted to the CSN for approval. Those waste materials affected that show radionuclide contamination value per mass unit below the clearance levels established in Annex VII table A PART 1 of Directive 2013/59/Euratom can be managed by conventional means. For their part, those waste materials that exceed it shall require an authorisation from MINETAD, pending the favourable report of the CSN.

Moreover the Order will guarantee the traceability of these waste materials until their delivery to final managers, which will be the responsibility of the licensee of the facility at which the corresponding registration and archive system must be maintained up to date at all times and made available to the CSN.

The project was published on the MINETAD website and submitted to the public participation and hearing process between representatives of interested sectors and before the Autonomous Communities.

19.2. Developments in the regulatory provisions of the Nuclear Safety Council (CSN)

The regulatory capacity of the CSN is established in Article 2 of the law that set it up, Law 15/1980 of 22 April, and it empowers the Council to propose to the Government the necessary regulations in the area of nuclear safety and radiation protection, along with the reviews considered necessary. Moreover, the CSN may also prepare and improve instructions, Circulars and Guides of technical character relating to radioactive and nuclear facilities and activities related to nuclear safety and radiation protection, in addition to the physical protection of facilities and nuclear and radioactive materials. The functions are developed more extensively in the Statute of the CSN (approved by Royal Decree 1440/2010 of 4 November).

Instructions are compulsory standards; the Circulars and Guides are technical documents of an informative or recommendatory nature for those subjects affected.

Since 2014, 10 new Instructions have been published, with the following affecting the scope of the Convention:

1. Instruction IS-38, of 10 June 2015, of the Nuclear Safety Council, on the training of personnel involved in the transport of radioactive material by road. (Official State Gazette (BOE) of 6 July 2015).

   The objective is to define the content of the initial and periodic online training programmes of Spanish companies involved in the transport of radioactive material by road, along with the registration of said training for the purpose of improving the conditions of nuclear safety and radiation protection of their operations in order to formalise the training required in the European agreement on the international transport of dangerous materials by road and in Article 21 of the Regulation on the health protection against ionising radiations (RPSRI).

2. Instruction IS-39 of 10 June 2015 of the Nuclear Safety Council in relation to control and monitoring of the manufacture of packaging for transport of radioactive material. (Official State Gazette (BOE) of 6 July 2015).

It identifies the procedure to follow for control of the manufacture in Spain of packaging, large containers for sand and gravel and large packages used for the transport of radioactive material, through control of the conformity of production, applying to manufacturers and purchasers of packaging, shippers of radioactive cargo with registered address in Spain independently of whether the cargo has a certificate of approval of design and the legally established control bodies.

3. Instruction IS-42 of 26 July 2016, of the Nuclear Safety Council, establishing the Council's notification criteria for events occurring during the transport of radioactive material (Official State Gazette (BOE) of 22 September 2016).

The objective is the establishing of notification criteria for events occurring in the transport of radioactive material within Spanish territory and outside Spanish territory where Spain was the country of origin, without prejudice to the notifications of other competent authorities in accordance with the applicable regulation for the transport of dangerous goods and other transport legislation. The Council's notification requirements are thus complete, already established at nuclear plants through IS-10, and in the radioactive facilities, through IS-18, considering the types of events that require notification, the terms within which this must be done, the information to be supplied and the persons responsible for same.

19.3. Other aspects of the regulatory framework

Inspection and evaluation system for nuclear and radioactive facilities

Law 15/1980 of 22 April, creating the CSN, amended by Law 33/2007 of 7 November, established the functions of this Body as guarantor of nuclear safety and radiation protection. Among these are the inspection of nuclear and radioactive facilities during the different phases from the project to the closing, with the CSN responsible during this final phase for the inspection of plans, programmes and projects necessary for the development of radioactive waste management.

The inspection activities are complementary to the evaluation of the facilities, for which the CSN issues the corresponding reports to MINETAD, as a prior step to the resolution which must be adopted to grant the authorisations for nuclear and radioactive facilities, as well as for the manipulation, processing, storage and transport of nuclear and radioactive substances. The acts of inspection carried out by the CSN are published on their website, pending the removal of data that may affect confidentiality or that cannot be revealed due to legal protection, by infringing on personal privacy, national defence or public safety, commercial or industrial confidentiality, intellectual property rights or the existence of sanctioning or disciplinary process in progress, among others.

Sanction regime for nuclear facilities

The sanction regime in relation to nuclear safety is established in Chapter XIV (Articles 85 to 93) of Law 25/1964, the Nuclear Energy Act, in accordance with the wording of Law 33/2007, which constituted a specification and improvement of the scenarios constituting infringement, the update, the upward adjustment of the quantities of the sanctions and the review of some of the technical criteria applicable for the certification of sanction and certain aspects of the administrative processing of reports. The principal aspects of the sanction regime are described in the Third National Report.

It is the responsibility of the CSN, among others, to propose the initiation of sanction proceedings in respect of those facts that may constitute infraction of nuclear safety, radiation protection

and physical protection, while also responsible for informing the body responsible for the proceeding, which is the Directorate General of Energy Policy and Mines of MINETAD. When the sanction proceeding is initiated in these areas not taken by the CSN or where it is but where said proceeding contains other data in addition to those communicated, the CSN will issue a perceptive report with a term of three months for the adequate classification of the facts.

The maximum term for the processing and notification of the report on the part of the sanctioning body is one year, contemplating the possibility of suspending this term up to a maximum of three months when the CSN must issue a report once the proceeding is initiated.

Assignment of responsibilities

The assignment of functions and responsibilities within the legal system in relation to nuclear energy remains essentially the same as that which existed previously, as described in Section A.2 and Article 20 of this Report.

The competencies and functions of MINETAD in relation to nuclear energy have remained unchanged during the period of the Report and are provided for in Royal Decree 344/2012 of 10 February, developing the basic organic structure of the then Ministry of Industry, Energy and Tourism (which remains in force) and repealing the previous Royal Decree 1226/2010 of 1 October. There have been no significant amendments to said functions, as described in Section 20.1 of this Report.

In terms of the Nuclear Safety Council, their competencies and functions have not been substantially amended either in general terms, contained in its founding Law and developed through the Statue, approved by Royal Decree 1440/2010 of 5 November as described in Section 20.2 of this Report.

Finally, radioactive waste management, including spent fuel and dismantling and closure of the facilities, as has been commented previously, constitute an essential public service which is reserved for State ownership, entrusting same to ENRESA, which is established as a technical resource and service of the Administration by virtue of Article 38 bis of Law 25/1964, the Nuclear Energy Act, in the wording provided by Law 11/2009. The responsibilities assigned to ENRESA are those established in Royal Decree 102/2014 of 21 February for the responsible and safe management of nuclear spent fuel and radioactive waste. Said attributes are circumscribed in the ambit of the management of radioactive waste in all its forms, including the dismantling and the closures of nuclear facilities and activities linked to same, such as the management of the Fund for the financing of the General Radioactive Waste Plan, the development of research and development plans, the establishment of systems for the collection, transfer and transport of waste, the development of technical and economic studies and the actions in case of nuclear and radiation emergency such to support the competent authorities.

Article 20
Regulatory authority

Article 20. Regulatory Authority

1. *Each Contracting Party shall establish or designate a regulatory body entrusted with the implementation of the legislative and regulatory framework referred to in Article 19, and provided with adequate authority, competence and financial and human resources to fulfil its assigned responsibilities.*

> 2. *Each Contracting Party, in accordance with its legislative and regulatory framework, shall take the appropriate steps to ensure the effective independence of the regulatory functions and other functions where organizations are involved in both spent fuel or radioactive waste management and in their regulation.*

The regulatory function in the ambit of nuclear energy in Spain corresponds to the following authorities who, in accordance with the provisions of the applicable legislation, act based on their competencies within the scope of application of the Convention.

- ✓ The Government, responsible for defining the energy and management of radioactive waste policies and for dictating regulatory standards proposed by ministries with competencies in these areas.

  At present, Royal Decree 415/2016, of 3 November, restructuring the ministerial departments, and Royal Decree 424/2016, of 11 November, laying down the basic organic structure for ministerial departments, establish the new denomination of the Ministry of Energy, Tourism and the Digital Agenda (MINETAD) and the higher and executive bodies of which it is comprised.

  On the other hand, Royal Decree 344/2012, of 10 February, which develops the organic basic structure of the Ministry of Industry, Energy and Tourism, which by virtue of the first transitory disposition - Subsistence of bodies of Royal Decree 424/2016 of 11 November, establishing the basic organic structure of ministerial departments, defines the competencies and structure of MINETAD.

- ✓ The Ministry of Energy, Tourism and the Digital Agenda (MINETAD) is the ministerial Department of the Central State Administration responsible for granting, modifying, suspending or revoking authorisations for nuclear and radioactive facilities[6], subject to mandatory reports and, in some cases, binding reports[7] of the Nuclear Safety Council (CSN) in respect of nuclear safety and radiation protection, along with the reports that must be issued by other Departments or Bodies of the State Administration in other areas in accordance with the provisions of their specific regulation[8]. Similarly, it is responsible for submitting to the Government regulatory proposals that develop the legislation in force, adopting development provisions of the Government regulations and applying the nuclear energy sanction regime.

- ✓ The Governments of those Autonomous Communities which, by virtue of a legal disposition[9], have been transferred executive functions assigned to MINETAD.

- ✓ The Nuclear Safety Council (CSN) which, in accordance with the provisions of its creating law (Law 15/1980 of 22 April amended by Law 33/2007) is the only competent State body in the area of nuclear safety and radiation protection, being a Public Law

[6] *In the case of Category 2 and 3 radioactive facilities, the Autonomous Communities are responsible for exercising the executive functions of MINETAD where these have been transferred by virtue of legal disposition.*

[7] *The reports of the CSN are binding provided they are negative or, where they are positive, under the conditions determined.*

[8] *The regulation in terms of physical protection of nuclear materials is an area shared between MINETAD, the Ministry of the Interior and the CSN, with each institution responsible for the exercise of the corresponding functions in accordance with the respective competencies. The regulation in force established that the Ministry of the Interior and the CSN must issue to MINETAD reports prior to the granting for authorisations for the physical protection awarded by the latter.*

[9] *Specifically, in the case of the Autonomous Communities of Catalonia, the Basque Country, the Balearic Islands, Murcia, Extremadura, Asturias, Madrid, Galicia, Cantabria, the Canary Islands, Ceuta, Navarra, Valencia, Castilla y León, La Rioja and Aragón.*

entity independent of the General State Administration with legal personality and its own budget independently of the State.

The CSN, in order to exercise its competencies and functions established in the legislation, requires contact with the Cortes Generales (Congress and Senate) and with the Government and the competent ministerial departments of same and Autonomous Governments.

With respect to contact with the Cortes Generales, the competent committee of the Congress of Deputies will perform the supervision of the CSN activities, through the report the CSN issues annually, through the periodic appearance and upon the request of the Congress or on own request, to inform on the relevant issues. The Committee might also require the appearance of other public authorities or entities involved in nuclear energy. Based on said appearances, the Congress of Deputies, upon the proposal of the Commission might urge the Government or the CSN, in accordance with the area discussed, to establish certain measures or initiate regulatory proceedings. Likewise, the CSN appears before the competent Senate committee, upon the request of said institution or upon its own request to provide information on matters in its area.

The CSN deals with the Government primarily through MINETAD (in accordance with Royal Decree 344/2012, of 10 February) for all that relates to the processing of authorisations in all phases of the selection of site, construction, start-up, operation and dismantling of nuclear and radioactive facilities. It is the responsibility of MINETAD to request the mandatory and, in some cases, binding reports concerning nuclear safety and radiation protection, prior to the granting of any type of authorisation to the facilities. The CSN will propose to the Government the new regulation and review of the existing regulation in relation to nuclear safety, radiation protection and the physical protection of nuclear facilities and materials, in collaboration with the competent authorities and that which is necessary in accordance with the international obligations applicable in this ambit. Moreover, the CSN can propose initiation of the corresponding sanction proceedings.

Thus, the CSN collaborates with other ministerial departments both for the better exercise of its functions and for cooperation in areas of common interest. In addition to with MINETAD, the main ministerial departments with who the CSN works are:

- ✓ Ministry of Agriculture and Fisheries, Food and the Environment: The CSN participates in the proceedings for the declaration of environmental impact, in relation to the evaluation of the radiological impact of the facilities that may cause an impact of this kind.
- ✓ Ministry of the Interior and Ministry of Defence, in relation to emergency management, physical protection and civil protection from the risk of radiation.
- ✓ Ministry of Education, Culture and Sport, in relation to the training of secondary school teachers.
- ✓ Ministry of Health, Social Services and Equality: The CSN collaborates with this Ministry in relation to radiation protection (protection of the patient, workers, the public and the environment).
- ✓ Ministry of Development, in relation to fight against sea pollution, the technical building code, etc.
- ✓ Ministry of the Economy, Industry and Competitiveness, to which CIEMAT is assigned.

Moreover, we must underline the fact that both MINETAD and the CSN maintain close relation in their respective areas of competence, with the Parliaments and Government of Autonomous Communities.

With respect to MINETAD, Spanish legislation provides for the possibility that some of the competencies of the Central Administration be transferred to the Autonomous Communities. As has already been demonstrated above, several Autonomous Communities exercise executive functions originally assigned to MINETAD through the Regulation of Nuclear and Radioactive Facilities (RINR, as per the Spanish), in relation to Category 2 and 3 radioactive facilities.

In addition, MINETAD is obliged to transfer to those Autonomous Communities where facilities are located or whose territory is part of the area of action of the Nuclear Emergency Plan of the facilities, of the information present in authorisation requests, so that the relevant arguments in relation to territorial planning or the environment can be put forward.

On the other hand, with respect to the CSN, in accordance with the provisions of Law 15/1980, it may task Autonomous Communities with exercising the functions attributed to this body, in accordance with the general criteria agreed by the CSN in relation to same. To this effect, assignment agreements are signed in which the competencies attributed to the CSN in the legislation remain its responsibility. Currently, the CSN has assignment agreements signed and in place with nine Autonomous Communities: Asturias, Catalonia, Galicia, Balearic Islands, Canary Islands, Murcia, Navarra, the Basque Country and Valencia. One representative of each of the Autonomous Communities that have nuclear facilities in their territory or who maintain assignment agreements with CSN participates in the "Assessment Committee for Public Information and Participation in Nuclear Safety and Radiation Protection."

Finally, it must be added that according to the CSN statute, it shall regularly inform the Government, the Congress and the Senate, the Governments and Parliaments of the Autonomous Communities concerned, of any circumstance or event affecting the security of nuclear facilities or the radiation quality of the Environment in any part of the national territory. Moreover, the CSN must issue annually to the Parliaments of Autonomous Communities in the territories of which nuclear facilities are located a report on its activities.

20.1. Structure, competencies and functions of the Ministry of Energy, Tourism and the Digital Agenda

20.1.1. Organic structure

The present basic organic structure of the ministerial departments of the Government is established via Royal Decree 424/2016 of 11 November, assigning the following higher bodies to MINETAD:

- ✓ The State Secretariat for Energy, to which the Directorate General of Energy Policy and Mines is assigned.
- ✓ The State Secretariat for Tourism.
- ✓ The Secretariat of State for the Information Society and the Digital Agenda, to which the Directorate General for Telecommunications and Information Technologies is assigned.
- ✓ The Under-secretary for Energy, Tourism and the Digital Agenda, to which the General Technical Secretariat is assigned.

The basic organic structure of MINETAD is developed through Royal Decree 344/2012 of 10 February, repealing the previous Royal Decree 1226/2010 of 1 October. This piece of legislation also established the State Secretariat for Energy as the higher Body responsible for energy and, within this, the Directorate General of Energy Policy and Mines as the executive body that develops, within the specific ambit of nuclear energy, the functions detailed in the following section.

Within the Directorate General of Energy Policy and Mines, the Sub-directorate General for Nuclear Energy (SGEN) is responsible for the practical execution of said functions. In addition, the SGEN works with other executive and general services bodies of MINETAD integrated within and without the State Secretariat of Energy for the exercise of functions, such as the General Technical Secretariat for the processing of legislative proposals, the State Attorney for support and legal consultation, the Sub-directorate General of International Relations and Cooperation in relation to the Permanent Representations of Spain before International Organizations specialising in nuclear energy or the Sub-directorate General of International Energy Relations, created for the purpose of undertaking coordination functions and management of international energy processes, participation in different international forums and community regulation activity or monitoring of community energy policies (including nuclear) among other competencies.

In Section L, Annex H of this Report, an organisational chart of MINETAD is included, showing the bodies with functions attributed relating to the Convention, along with the scheme of blocks with the structure of areas and functional services of the SGEN.

20.1.2. Competencies and functions

In accordance with current legal ordering, MINETAD is one of the authorities with competencies and functions within the Spanish regulatory system in relation to energy and, in particular, in relation to nuclear energy. It must be noted that the generation of electrical energy in Spain is fully liberalised, and therefore, as had been indicated previously, the actions of the Government, through MINETAD, are limited to establishing energy planning and regulating the different energy sectors. Consequently, MINETAD does not exercise any function in the development or the promotion of nuclear energy.

Competencies pertaining to nuclear energy attributed to different bodies have not been substantially modified in respect of the Fifth National Report. MINETAD, within the scope of the provisions of Royal Decree 344/2012, exercises the following competencies and functions that come within the scope of the Joint Convention:

- ✓ Grants the authorisations for nuclear and radioactive facilities, except those Category 2 and 3 radioactive facilities located in Autonomous Communities where the executive functions corresponding to the Central Administration have been transferred, subject to a favourable report from the CSN.
- ✓ Prepares legislation proposals and applies the sanction regime established by Law 25/1964 of 29 April, the Nuclear Energy Act. When regulatory developments refer to nuclear safety or radiation protection, it is the responsibility of the CSN to prepare proposals.
- ✓ Manages administrative registries (pertaining to the transport of nuclear and radioactive materials, radioactive facilities, activities relating to the commercialisation of materials and radioactive devices, etc.).
- ✓ Defines radioactive waste management policy.
- ✓ Contributes to the definition of the R&D policy, in coordination with the Ministry of the Economy, Industry and Competitiveness. To such effect, upon the initiative of MINETAD, in the year 1999 the Strategic Nuclear R&D Committee (CEIDEN) was set up[10], the predecessor to what is now the Spanish R&D Technology Platform of Fission Nuclear Energy (still CEIDEN), whose purpose is to bring together all the sta-

[10] *Currently, CEIDEN oversees 101 represented entities and 17 collaborating entities, with the CSN occupying the Presidency, renewable every two years.*

keholders of the nuclear energy sector including MINETAD itself, the CSN, the universities and research centres, the operators and the industry associations, to identify synergies and points of common interest in research programmes and activities they develop, and to participate in international programmes. In the area of radiation protection, in 2014 the new National Platform for R&D in Radiation Protection (PEPRI) was set with the general objective of promoting R&D&I activities geared towards protection from radiation.

- ✓ It performs monitoring of compliance with international commitments subscribed by Spain in the field of nuclear energy and, in particular, safeguards, non-proliferation and civil liability for nuclear damage.
- ✓ It works closely with international bodies specialised in nuclear energy, through the SGEN in the area of the Euratom Treaty and its committees and related working groups, within the framework of the IAEA and the OECD Nuclear Energy Agency (NEA), in relation to the European Bank for Reconstruction and Development, the European Nuclear Energy Forum, etc.

20.1.3. Human resources and training

The SGEN, which is the Sub-directorate General responsible for the functions of MINETAD in relation to nuclear energy, is fully staffed by civil servants belonging to different bodies of the State Administration. The normal system of access to jobs in different units of MINETAD, including the SGEN, covered by the public employment offer, is through examinations, followed by a selective training course. In addition, these positions within the SGEN may be accessed through civil servant transfer process from other areas of the General State Administration, provided that the bodies of Administrations are compatible with the requirements in relation to the positions at MINETAD for the positions applied for.

At the present time, there are 13 positions within the SGEN. 77% of the civil servants that currently belong to the SGEN have university academic training, the majority being industrial engineers belonging to the State Corps of Industrial Engineers, while there are also some belonging to other corps of engineers. The distribution of personnel in terms of knowledge and experience in administration and in nuclear technology is balanced and responds to service requirements.

The budget of the Directorate General for Energy Policy and Mines, which is the body to which the SGEN is assigned, is included within the National Budget, in the same way that any other organisational unit of the Ministerial Departments of the Central State Administration.

The training programme of the SGEN is fully integrated within MINETAD's general training plan, which covers both technical training in relation to energy, and administrative, legal and economic matters.

20.2. Structure, competencies and functions of the Nuclear Safety Council (CSN)

20.2.1. Organic structure of the CSN

Law 15/1980, of 22 April, on the creation of the Nuclear Safety Council, and Royal Decree 1440/2010 of 5 November, approving the organic structure of the CSN establish the following structures:

- ✓ Presidency:
- ✓ Plenary, comprised of four members, one of whom occupies the vice-presidency
- ✓ The Technical Directorate for Nuclear Security and the assigned Sub-directorates.
- ✓ The Technical Directorate for Radiation Protection and the assigned Sub-directorates.
- ✓ The General Secretariat to which the following Sub-directorates and Units are assigned:
  - ➪ Sub-directorate for Personnel and Administration
  - ➪ Sub-directorate for Information Technologies
  - ➪ Sub-directorate for Legal Counsel
  - ➪ Planning, Assessment and Quality Unit
  - ➪ Inspection Unit
  - ➪ Research, Management and Knowledge Unit

Section L, Annex H of this Report includes an organisational chart of the CSN.

The higher management bodies of the CSN are the Plenary and the Presidency, which exercise their respective competencies with no hierarchical subordinate relationships among them. The Plenary is comprised of a President and four commissioners, well-known and reliable individuals in areas of responsibility of the CSN. Both the President and the commissioners are appointed by the Government, by Royal Decree, pending appearance before the Congress of Deputies to assess their capacity.

Under the direction of the Presidency and the Plenary is the General Secretariat. Under the direct management of the President, within the framework of the agreements adopted by the Plenary and the directives issues by the internal commissions, the General Secretariat is responsible for the provision of common services to the CSN. The Secretary General acts as Secretary of the Plenary attending its sessions with a voice but without a vote.

Other management bodies of the CSN, in addition to the Technical Management Cabinet of the Presidency are the following two Technical Directorates:

- ✓ The Technical Directorate for Nuclear Safety, with responsibility for all the functions relating to the safety of nuclear facilities, except those pertaining to the disposal of Low and Intermediate Level Waste, which are the responsibility of the Technical Directorate for Radiation Protection. It also assumes that relating to the security of transport of nuclear substances and radioactive waste. It also has three Sub-directorates: Nuclear Facilities, Engineering and Nuclear Technology.
- ✓ The Technical Directorate for Radiation Protection, in addition to inspection and control of radioactive facilities, radiation protection for workers and management of low and intermediate level waste, assumes responsibility for the radiation protection of the public and the environment and radiation emergencies. This Directorate has three Sub-directorates: Environmental Radiation Protection, Operational Radiation Protection and Emergencies and Physical Protection.

20.2.2. Competencies and functions of the CSN

The CSN is a public law entity, with separate legal personality and its own budget, which enjoys independence in respect of the General State Administration and is the only body competent for nuclear safety and radiation protection in Spain.

The functions of the CSN appear to be principally related to Article 2 of Law 15/1980 and Title I of the Statute, without prejudice to the competencies contained in other standards. Insofar as they concern the scope of the Convention, and to summarise, the functions of the CSN are the following:

1) To issue mandatory reports to MINETAD in relation to authorisations for nuclear and radioactive facilities and all the activities related to the manipulation, processing, storage, disposal and transport of nuclear and radioactive substances; issue the preliminary reports for resolutions dictated by MINETAD in exceptional cases and circumstances, in relation to the safe removal and management of radioactive waste.

2) In relation to radioactive waste, it informs MINETAD on the concentrations or levels of activity for consideration of same, of those materials that contain or incorporate radioactive substances and those for which no use is intended.

3) Proposes to the Government the regulations necessary in the area of responsibility. It also prepares and approves the instructions, Guides and Circulars of a technical character, in relation to nuclear safety and radiation protection.

4) Proposes the initiation of sanction proceedings in its area of its responsibility. In addition, the Council will issue a mandatory report within a period of three months for the appropriate confirmation of the facts when the sanction procedure relating to nuclear security, radiation protection or physical protection has been initiated by another body, or upon the reasoned request of the CSN itself and, in this case, said procedure shall include other data in addition to those communicated by that body. The sanctions shall be imposed by the executive body of the Central Government or the Governments of Autonomous Communities.

   The CSN also has the power to issue penalties to licensees, propose corrective measures and impose corrective penalties.

5) To carry out monitoring and control of nuclear and radioactive facilities, performing inspection and control of nuclear and radioactive facilities during all phases, and inspection of transport, manufacture and standardisation of equipment with radioactive sources or that generating ionising radiation and the approval and validation of packages destined for the transport of radioactive substances.

   To monitor and control the dose of radiation received by personnel operating and unloading radioactive material outside nuclear and radioactive facilities and the incidence, particular and accumulative, in areas of influence of these facilities.

6) To carry out the studies, evaluations and inspections of the plans, programmes, and projects necessary for all phases of the management of radioactive waste and of new designs.

   Similarly, it shall issue a preliminary report on the General Radioactive Waste Plan which MINETAD submits to the Government for approval.

7) To maintain official relationships with similar foreign bodies and participate in international nuclear safety and radiation protection bodies and advise the Government in relation to the commitments of these with other countries.

8) To inform public opinion on its areas of responsibility, without prejudice to the publicity of these administrative actions in legally established terms.

   The CSN is obliged to inform citizens of all relevant facts regarding nuclear and radioactive facilities; the reports issued are made public, as are the details of inspections carried out; a public information procedure is established during the preparation phase of the instructions and technical guides of the CSN.

9) To collaborate with competent authorities in the preparation of the criteria of off-site emergency plans and physical protection plans for nuclear and radioactive facilities.

   To coordinate all aspects related to nuclear safety and radiation protection, the measures and the response to emergency situations.

   It inspects, assesses, controls, proposes and adopts the preventive and corrective measures required in exceptional situations or nuclear or radiation emergencies, when they originate in facilities, equipment, companies or activities not subject to the authorisation regime of nuclear legislation.

10) Establish and carry out monitoring of research plans in the area of nuclear safety and radiation protection.

11) To archive and keep documentation which must be submitted to the Nuclear Safety Council by the licensees of authorisations to operate nuclear facilities when the definitive cessation of activities occurs prior to transfer of the license and the granting of the authorisation for the dismantling of same.

20.2.3. CSN International Relations

International relations play a fundamental role in the work performed by the CSN. The international activities of the CSN are developed on two different levels: the multilateral across international bodies, institutions and forums, and the bilateral through agreements with approved institutions.

The primary activity in the area of multilateral international relations consists of the CSN's participation in the management bodies, committees and working groups of various international bodies, such as the International Atomic Energy Association (IAEA) and the Nuclear Energy Agency (NEA/OECD), and in the framework of European Union institutions. Similarly, the CSN collaborates with non-governmental international institutions such as the International Commission on Radiological Protection (ICRP).

In this period the CSN has participated in activities relating to compliance with the commitments contracted by Spain as a Contracting Party of the following international conventions:

- ✓ Convention on Nuclear Safety, the CSN acts as a national point of contact and coordinates the preparation of national reports.
- ✓ Joint Convention, cooperates with MINETAD in the preparation of National Reports.
- ✓ Convention on the Physical Protection of Nuclear Materials.
- ✓ OSPAR Convention on the Protection of the Marine Environment of the North-East Atlantic.
- ✓ Convention on Early Notification of a Nuclear Accident.
- ✓ Convention on Assistance in the case of a Nuclear Accident or Radiological Emergency.

On the other hand, the CSN participates in the following groups and associations of nuclear regulators:

- ✓ International Nuclear Regulators Association (INRA).
- ✓ Western European Nuclear Regulators Association (WENRA).
- ✓ Heads of the European Radiological Protection Competent Authorities (HERCA).
- ✓ Ibero-American Forum of Radiological and Nuclear Regulatory Bodies (FORO).

In terms of bilateral relations, the CSN has agreements and maintains activities in the fields of nuclear security, radiological protection and waste management with numerous partner bodies.

The CSN actively participates in technical cooperation with the IAEA, providing experts for participation in seminars, offering scholarships and hosting scientific visits of experts and organising activities in Spain in relation to the safe management of radioactive waste.

20.2.4. Human resources, training and funding of the CSN

✓ Human resources:

The CSN, as the body responsible for nuclear safety and radiation protection, requires technical personnel specialised in this field. Said technical personnel are trained by civil servants belonging to the Nuclear Safety and Radiation Protection Corps as established in Article 8 of Law 15/1980 on the creation of the CSN and which is accessed through a selection-examination process called by the CSN itself. Apart from said personnel, civil servants from other Corps of the Public Administration, temporary and contract staff also form part of the organisation.

As of 31 December 2016, the personnel of the CSN consisted of 459 employees, of which 220 were civil servants of the Nuclear Safety and Radiation Protection Corps, dedicated to inspection, control and monitoring of the performance of nuclear and radioactive facilities; another 141 were civil servants belonging to the Corps and Scales of the Public Administrations; 27 were temporary staff; 7 senior management (The Secretary General position being vacant) and 64 were contract staff. Women represent 52% of total personnel and men the remaining 48%. The average age of personnel was 53. In terms of the qualification of the personnel, 69.94% had higher qualifications, 5.88% had undergraduate degrees and 24.18% had other qualifications.

A priority objective of the CSN is to incorporate new civil servants to compensate the effect of retirements. Since 2014, 32 new vacancies have been offered and 25 new civil servants have joined the staff of the CSN.

✓ Training plan for CSN staff:

Since its creation, the Nuclear Safety Council has placed special focus on the training of all its personnel. This can be seen in the annual training plans that establish the annual plan for training activities, which are organised internally or in collaboration with specialised external organisations and the participation of the personnel of the CSN in activities organised by different institutions of a broad geographic and sectorial scope. Training activities have focussed on scientific and technical training, legal and administrative training, the development of management, organisation and communication skills and use of work procedures and tools.

The Training Plans for 2014, 2015 and 2016 were prepared in accordance with the needs of the Technical Directorates and the rest of the Sub-directorates and Units involved, with their contents grouped across seven training programmes:

1. Technical Upgrading and Retraining:

   Sub-programme of Nuclear Safety.

   Sub-programme of Radiological Protection.

   Sub-programme of Support Areas

   Sub-programme of Initial Technical Training (NS and RP) (from 2015).

2. Managerial Development.

3. Administrative and Legal Management.

4. Occupational Risk Prevention.

5. IT.

6. Languages.

7. Skills.

In 2014, training was provided for a staff of 446 people. 112 courses were delivered totalling 26,393 hours and the total expenditure on training totalled € 305,508.49. In 2015, for a staff of 451 employees, 147 courses were delivered, dedicating 29,109 hours to training. The expenditure on training activities was € 430,168.59. In 2016, for a staff of 459 employees, 162 courses were delivered, dedicating 32,192.5 hours to training. The total expenditure on training activities was € 415,951.39.

In the 2015 and 2016 training plans, a dedicated sub-programme has been included to provide the necessary training for civil servants on probation who have passed the successive stages of the selection-examination process to join the Nuclear Safety and Radiation Protection Corps, authorised in successive Public Employment Offers.

Funding

The budgets for the expenditure and funding of the CSN are included in the General State Budgets and, therefore, Parliament is responsible for their approval. The two most important budget allocations in terms of funding are, on the one hand, the fees and public tariffs and other income the CSN derives from the provision of its services and, to a lesser extent, the transfers from the State, the contributions of which have been reduced in accordance with the policies of budgetary adjustment and fiscal consolidation. As a result, the funding of the CSN now comes almost exclusively from its own resources.

a) The rates, public tariffs and other sources of income regulated by Law 14/1999 of 4 May on Fees and Prices Charged to the Public for Services Rendered by the Council for Nuclear Safety. The most important fees, in quantitative terms are obtained by:

   - Preparation of studies, reports and inspections prior to authorisations for operation and closure of nuclear and radioactive facilities granted by MINETAD.
   - Inspection and control of nuclear and radioactive facilities in operation and related activities.
   - Granting of licenses to personnel designated to operate or supervise the operation of nuclear and radioactive facilities.

   The public tariffs finance the reports, tests and studies on new designs, methodologies simulation models and verification protocols relating to nuclear safety or radiation protection.

   This source of funding accounted for 99.71% of the total budget for 2016.

b) State Transfers. The CSN carries out controls of radiation protection measures for the general population and the environment. These functions do not constitute the taxable transaction of fees and public tariffs, but rather their financing by the General State Budget via MINETAD. This part of the budget represented 0.29% of the total.

20.2.5. CSN Management System

The CSN has implemented a Management System focussed on processes, based on the requirements of the IAEA (GS-R3) and Standard ISO 9001: 2008. The processes, which cover all of the Body's activities, have been classified as follows:

- ✓ Strategic processes, including the function of the Plenary, the information and communication and the development of standards.
- ✓ Operational processes, including the authorisation, assessment, monitoring and control of facilities (including transport); the licensing of personnel; radiation protection of workers, the public and the environment, management of emergencies and physical security.
- ✓ Support processes, including institutional and international relations; research and development, economic management and human resources (including training); information systems; documentation and the administration of the Management System.

The documents that describe the system are organised hierarchically: System Manual, Process Map, Organisation and Procedures Manual. All of these documents, along with the information and documentation necessary to carry out the regulatory activity are available on the CSN website for all staff, with the justified exceptions for security or confidentiality reasons.

The Management system undergoes continuous improvement. In addition to the compliance assessments of the plans and objectives, the CSN has established an audit plan which is submitted for external assessment on the part of national and international bodies.

- ✓ The internal audit plan sees that all processes are audited with the established frequency based on the importance of the process and of the applicable legal requirements. There is a specific audit programme for activities that have been transferred to Autonomous Communities.
- ✓ The CSN, in addition to undertaking audits and the necessary economic and financial controls required of all public bodies, must systematically inform the Spanish Parliament and the Autonomous Communities that have nuclear facilities. The Parliament is responsible for continued supervision of the activities of the CSN.

20.2.6. CSN Knowledge Management

The IAEA defines knowledge management as the integrated and systematic focus on identifying, managing and sharing the knowledge of an organisation and making it possible for groups of people to create new knowledge to enable the organisation to achieve its objectives. The recommendations of the IAEA in the area of knowledge management are integrated into the organisation's model for the creation of skills in regulatory bodies.

In the year 2014, the CSN began consultation activity as a first step towards addressing the issue of knowledge management with a project on "Evaluation of Critical Processes of Technical Knowledge" at the Technical Directorate of Nuclear Safety, which concluded with some recommendations to be taken into account in the development of knowledge management in the CSN. The final objective is to develop a knowledge management model adapted specifically to the needs of the CSN, based on the recommendations of the IAEA, which is fully incorporated into its Management System and which uses characteristic elements of knowledge management which are already available.

During 2016, an action plan focussing on the preservation / recovery of the knowledge and experience of CSN technicians born in and before 1952 was carried out, applied specifically to 16 technicians.

The methodology of the preservation of key knowledge in the CSN was called the RECOR Project and includes the following phases:

1. Preparation phase: Identification of holders of critical knowledge
2. Knowledge extraction and systematization phase
3. Advantage phase: Roll-out of an agenda for taking advantage of systemised knowledge

Each general phase has specific exercises which are duly transferred into nine work stages, which are summarised in:

1. Phases 1, 2 and 3: Identify, empathise and characterise: Selection of the candidate, creation of an environment for the transfer of knowledge of the expert area of activity.
2. Phases 4, 5 and 6: Converse, explore in-depth and systemize: The flowering of details which are the key to knowledge and creation of pieces/products of knowledge.
3. Phases 7, 8 and 9: Test, adjust and take advantage: Validation of results and planning of actions to take full advantage of knowledge.

"Knowledge books" have been produced, each of which includes the position and the job profile, command of knowledge, relationship framework, documents related to the position (procedures and processes), elicited knowledge experiences (narratives, technical files, audiovisual aids) and knowledge products (series, transfer workshops and mentoring itineraries). Moreover, a procedure has been developed to preserve the key knowledge of the CSN as well as several facilitators' training sessions.

20.2.7. Independence of the regulatory body

The independence of the CSN is expressly regulated by its creating Law:

> *"The Nuclear Safety Commission is set up as a Public Law entity, independent of the General State Administration, with legal personality and its own budget and independent of those of the State and as the only body with competency in the area of nuclear safety and radiation protection. It shall be governed by its own Statute prepared by the Council and approved by the Government, the text of which shall be notified to the competent Commissions of the Congress and the Senate prior to publication and the specific provisions necessary, without prejudice to the supplementary application of the provisions of common or special legislation."*

This same declaration of independence is contained in the Statute of the CSN, stating in Article 2.4 that

> *"The Nuclear Safety Commission acts in carrying out its activity and in compliance with its organic and functional autonomy, full independence from Public Administrations and interest groups. In addition, it is subject to parliamentary and legal control. The resolutions adopted by the Plenary and the President of the Nuclear Safety Commission in exercising the assigned public functions may put an end to the administrative route."*

In addition Article 8.2 of the Law creating the CSN empowers the Council

> *"in accordance with the standards established in the Statute to contract the services of personnel, companies and national or foreign organisations, exclusively to perform work or prepare specific studies, provided that there is no link with those affected by the services subject to the contracting. Under no circumstances shall non-CSN personnel participate directly in the decision-making process around administrative files in progress. The CSN shall establish the necessary means to ensure that staff, companies and contracted external organisations respect at all times the obligations of independence required during the provision of services."*

Similarly, according to the Law creating the CSN itself, CSN reports issued to MINETAD in relation to nuclear safety, radiation protection and physical protection, prior to the resolutions adopted by MINETAD in relation to the granting of authorisations, shall be mandatory in all cases and, moreover, binding where they are negative or where they refuse a concession and, where they are positive, so shall the conditions they establish.

20.2.8. Transparency of regulatory activities and information for the public

The CSN, in its strategic plan for the 2011-2016 period, recognises the principle of transparency as one of its fundamental values, based on the capacity to provide citizens with relevant, valid and fully verifiable information in all matters relating to nuclear safety and radiation protection.

This policy of transparency has its roots in Law 15/1980 of 22 April, creating the CSN, amended by Law 33/2007 of 7 November. It also incorporates aspects contained in the Aarhus Convention, ratified by Spain in the year 2004 and materialised in the national legislation in Law 27/2006 of 18 July, regulating the right to information, public participation and access to justice in environmental matters.

Moreover, the amendment to the Law creating the CSN in 2007 broadened the requirements in relation to public information, with the aim of increasing the transparency of the organisation and increasing confidence among the citizens in CSN activities. The Law establishes three ways to channel this demand:

- ✓ Transmission of information to the institutions of State:

  The CSN issues annually, to the Cortes Generales and to the autonomous parliaments of the Autonomous Communities who have nuclear facilities in their territories, a report detailing its activities. In addition and as part of the relations with the Cortes, the CSN responds to parliamentary initiative (oral and written questions, legislation proposals, etc.) and complies with the resolutions issued for annual reports.

- ✓ Information committees on the environments of nuclear facilities :

  The legislation establishes that the CSN must impulse and participate in international forums in the area of these facilities, presided over by MINETAD to cover aspects related to the control and monitoring of nuclear and radioactive facilities and emergency preparation. The operation of these Information Committees is regulated by the RINR, approved by Royal Decree 1836/1999, of 3 December with its successive amendments.

- ✓ Public information policy:

  Article 14 of Law 15/1980, creating the CSN, establishes the need to facilitate access to information and the participation of the citizens and of civil society. This implies

the obligation to inform the media and interest groups of relevant facts pertaining to the operation of the facilities, placing special focus on the communication of events and incidents that might affect safety, the possible radiological impact on people and the environment and corrective measures to be applied.

Along these lines, the CSN publishes on its website the inspection reports for facilities, the information on the operational status of nuclear power plants and information on environmental quality measured by the Network of Automatic Environmental Radiation Alert Stations. The minutes of meetings of the Council and the technical reports that support the decision making of same are also published. In addition, on its website the CSN keeps an up to date record of the results of the systematic assessment programme for the operation of the power plants, called the Integrated Plant Supervision System (SISC, as per the Spanish) which incorporates new supervision methods focused on observation of behaviour of nuclear power plants in operation through the functioning and the assessment of the findings of the inspections carried out by the CSN.

In case of the occurrence of any significant event or incident in nuclear and radioactive facilities, news, reviews and press statements on same are published on the website. In parallel the CSN attends to the direct requests for information from the media with all the flexibility that technical rigour allows.

With regard to the participation of citizens:

- ✓ The CSN is obliged to submit instructions and safety guides to public comment during their preparation, for which it provides an online space on its corporate website through which comments can be submitted. Similarly, MINETAD provides information on current regulation in relation to nuclear energy and submits the proposals for royal decrees and regulations to the due process of public participation through its website.
- ✓ The Advisory Committee for information and public participation

  The Law creating the CSN establishes the constitution of an Advisory Committee for Public Information and Participation which began functioning on 23 February 2011. The purpose of this committee is to issue recommendations to the CSN to improve transparency, access to information and public participation in its areas of competency.

  The Advisory Committee is comprised of representatives of the main national interest groups which include Ministries, Universities, Professional Associations, electricity industry groups, mayors of areas with nuclear power plants and NGOs.

Other channels of communication:

- ✓ Communication in the international ambit

  One of the strategic lines of action of the CSN for the period 2011-2016 is the drive for institutional relations policies and communications with other bodies in the international sphere. For that the CSN participates actively in different international forums with the aim of exchanging experiences and technical and regulatory knowledge in the area of nuclear safety and radiation protection, establishes best practices to reinforce the safety of facilities in our country and to strengthen international coordination of response plans to emergencies.
- ✓ Dissemination activities and the Interactive Information Centre

  The CSN carries out a broad range of activities, whether technical or informative, on topics related to its activity. Among others, the most relevant actions are the organisation of conferences, seminars and training activities and extensive publishing activity including "Alfa", the Nuclear Safety and Radiation Protection Magazine.

Moreover, the CSN has an Interactive Information Centre which receives a significant number of visits (it recently reached 100,000), the majority from centres of education and national and international institutional delegations.

Section F

Other Provisions related to Safety

Section F. Other Provisions related to Safety

Article 21
Responsibility of the License Holder

Article 21. Responsibility of the License Holder

1. *Each Contracting Party shall ensure that prime responsibility for the safety of spent fuel or radioactive waste management rests with the holder of the relevant licence and shall take the appropriate steps to ensure that each such licence holder meets its responsibility.*
2. *If there is no such licence holder or other responsible party, the responsibility rests with the Contracting Party which has jurisdiction over the spent fuel or over the radioactive waste.*

21.1. Responsibility of the Licence Holder with regard to Safety

Spanish legislation establishes, as a basic principle, that the primary responsibility of the safety of waste management facilities falls on the license holder.

The legal provisions for the responsibility of the license holder of facilities is contained in Law 25/1964, the Nuclear Energy Act, Royal Decree 102/2014, of 21 February, on the Responsible and Safe Management and Spent Nuclear Fuel and the Nuclear and Radioactive Facilities Regulation (RINR), approved by Royal Decree 1836/1999, of 3 December. From the point of view of civil liability for nuclear damage, the license holder of the facility is also held responsible for compensating for damage up to the limit provided in the legislation.

The Nuclear Energy Act establishes that the license holder of nuclear or radioactive facilities or of activities related to ionising radiation shall be responsible for their safety, and defines such as the physical or legal person responsible, in full, for a nuclear or radioactive facility as specified in the corresponding authorisation, underlining moreover, that said responsibility cannot be delegated.

The RINR states that to obtain the different authorisations, the applicant must present the organisation planned for supervision of the project and guarantee quality throughout the successive phases of the facility. It also requires a detailed description of each of the positions in the operator's organisation and the responsibilities of same in relation to nuclear safety and radiation protection and the presentation of organisations planned for the future operation of the facility and a preliminary scheme for the training of operative staff.

Moreover, the RINR indicates that the license holder of the facility is responsible for all the physical and legal persons involved as contractors or subcontractors at same facility and that they perform their activities in safe conditions within the terms established in official documents.

In accordance with the Nuclear Energy Act, the State shall assume ownership of radioactive waste once it has been definitively disposed of. In addition, the State shall assume responsibility for the supervision that may be required, after the decommissioning of a nuclear or radioactive facility, once the period of time established in the decommissioning declaration has elapsed.

21.2. Liability for nuclear damage

During the period covered by this report, no new changes have occurred in the civil liability regime for nuclear damage, which is detailed in Annex E.

Article 22
Human and Financial Resources

Article 22. Human and Financial Resources

Each Contracting Party shall take the appropriate steps to ensure that:

i. *qualified staff are available as needed for safety-related activities during the operating lifetime of a spent fuel and a radioactive waste management facility;*

ii. *adequate financial resources are available to support the safety of facilities for spent fuel and radioactive waste management during their operating lifetime and for decommissioning;*

iii. *financial provision is made which will enable the appropriate institutional controls and monitoring arrangements to be continued for the period deemed necessary following the closure of a disposal facility.*

22.1. Availability and qualifications of human resources

Legal framework

In Spain, Article 37 of Law 25/1964, the Nuclear Energy Act establishes an obligation of availability and aptitude for personnel at nuclear and radioactive facilities, and the Nuclear and Radioactive Facilities Regulation (RINR), approved by Royal Decree 1836/1999, of 3 September regulating the administrative authorisations regime, lists the requirements the licensee must present to the different authorities for licensing of a facility, and for personnel licensing and accreditation.

In the specific case of nuclear power plants, two CSN Safety Instructions (IS) from the year 2007 apply: IS-11, on licenses for operating personnel of nuclear power plants and IS-12, defining the qualification and training requirements of non-licensed staff.

Subsequent to these provisions, Directive 2011/70/Euratom was adopted. Article 7 of this Directive requires regulatory frameworks to oblige licensees to provide and maintain the appropriate financial and human resources in order to comply with obligations in respect of the safety of

nuclear spent fuel and radioactive waste management. In addition to this obligation, referring to the licensees, Article 8 extensively refers to the obligation to avail of knowledge and training of all parties involved in radioactive waste management.

The provisions for training of staff have been strengthened even further after the adoption of said Directive, with a section introduced to the RINR in September 2011 according to which personnel providing services at nuclear and radioactive facilities whose functions are related to nuclear safety, radiation protection or physical protection or whose activity may interfere with the operation of the facility, must meet all the necessary conditions for physical and psychological suitability, and may be submitted to preventive control and analysis to detect the consumption of intoxicating substances or narcotics. In accordance with this article, said controls are carried out both on direct employees at nuclear facilities and sub-contracted staff.

Internal Organisation of Personnel

At each nuclear facility there is a Head of Operations or technician responsible for supervision of employment and operations, with the power to suspend the operations of the facility. There are also positions of Head of the Radiation Protection Service, Supervisor and Operator of nuclear or radioactive facilities, which require specific licenses. Each of these licenses is personal, assigned to the licensee to perform their duties in a specific facility and is granted by the CSN after examination of the candidates by a jury designated by the CSN to assume responsibility for the corresponding service or technical unit, or as Head of the Radiation Protection Service.

In the operation request which is granted in accordance with the procedure indicated in the RINR, the Regulation of the Operation of the facility contains the organisation of the licensee, including the functions and responsibilities of all those positions related to nuclear safety and radiation protection, the basic training programmes for staff with or without licenses, the technical competition necessary for each specific mission and the re-training programmes considered appropriate. Amendments to this Regulation must be approved by the Directorate General for Energy Policy and Mines from MINETAD prior to the mandatory report of the CSN.

On the other hand, the On-site Emergency Plan assigns responsibilities and the necessary human resources to respond to emergency situations.

Once the facility is operational, the CSN carries out periodic inspections, mainly to check academic training, experience and training required in each type of position, the basic training in radiation protection for all operatives, the scope of the re-training programmes and verification that these cover changes in standards, changes in design and relevant operative experiences. Licensees must provide the CSN with an annual report that summarises the main training and re-training activities for personnel involved in nuclear safety or radiation protection.

Human resources available to ENRESA

ENRESA is tasked with the management of radioactive waste and spent nuclear fuel and the dismantling and decommissioning of nuclear facilities (Article 28 bis of Law 25/1964, the Nuclear Energy Act; Article 9 of Royal Decree 102/2014, of 21 February, for the responsible and safe management of spent nuclear fuel and radioactive waste). By virtue of regulation, ENRESA is considered the licensee of these facilities for the management of spent nuclear fuel and radioactive waste and acts as licensee of those other activities it carries out where so determined. ENRESA is the operator responsible for the El Cabril Disposal Facility, the dismantling processes at the Vandellós I and José Cabrera nuclear power plants and the Centralised Temporary Storage when it becomes operative.

On 31 December 2016, ENRESA had a staff of 330, of which 188 were employed at the head office in Madrid, 123 at the El Cabril Disposal Facility, 6 at the dismantling and decommissioning project at the Vandellós I NPP, 10 at the dismantling project at the José Cabrera NPP and 3 at Villar de Cañas working on the planning of the CTS.

Royal Decree 102/2014 assigns ENRESA the function of establishing training plans and research and development plans within the framework of the State Plan for Scientific and Technical Research and Innovation, which meet the requirements of the GRWP and allow them to acquire, maintain and continue to develop the necessary knowledge and skills.

22.2. Availability of financial resources

Spain has been building up a fund to finance the activities planned in the General Radioactive Waste Plan since ENRESA was constituted in the year 1984. The Fund, external to waste producers, is supported almost exclusively from contributions. The costs pertaining to the management of radioactive waste and spent fuel, the dismantling of nuclear facilities, structural costs and R&D projects are allocated to this fund.

The fund is currently regulated by the Sixth Additional Provision of Law 54/1997, of 27 November, on the Energy Sector and Royal Decree 102/2014, of 21 February, on Responsible and Safe Management of Spent Nuclear Fuel and Radioactive Waste. During the period of this Report, there have been no significant changes to the system of financing summarised in Annex D of this Report.

With regard to the radioactive facilities of the nuclear fuel cycle, their dismantling and decommissioning or closure is not covered by this Fund. In this case, the RINR establishes the obligation of licensees to present, prior to entry into operation, a financial guarantee or bond, guaranteeing the future dismantling and management of the resulting radioactive waste. Said guarantee must be constituted prior to the granting of the authorisation to operate and must be provided in such a way that covers the costs and contingencies that may arise from the dismantling and decommissioning or closure process at the facility, even in the event of insolvency, cessation of activity or any other contingency. The Directorate General for Energy Policy and Mines, of MINETAD, may authorise the update of said guarantee in the event of certain circumstances or modifications to the facility that might have a significant impact on its dismantling, decommissioning or closure, or in accordance with the works already carried out in relation to these activities.

Article 23
Quality Assurance

Article 23. Quality Assurance

Each Contracting Party shall take the necessary steps to ensure that appropriate quality assurance programmes concerning the safety of spent fuel and radioactive waste management are established and implemented.

Article 4.2 of Royal Decree 102/2014 of 21 February, for the responsible and safe management of spent nuclear fuel and radioactive waste, which completes the transposition of Directive 2011/70/Euratom, establishes that producers of radioactive waste and spent nuclear fuel shall install and apply integrated management systems including quality assurance, which grant due priority to the safety of management, and may be subject to periodic verification.

All activities related to the management of spent fuel and radioactive waste in Spain, are submitted to a Quality Assurance Programme (QAP). The licensee of the authorisation for the facility

of regulated activity is responsible for establishing and executing this programme. QAPs must comply with Standard UNE 73-401 *"Quality Assurance at Nuclear Facilities"*, whose requirements are equivalent to those of Appendix B of 10 CFR50 of USA NRC and of the code and guides of IAEA 50-C/SG-Q on Quality Assurance for Safety in Nuclear Power Plants and other nuclear facilities.

On the other hand, the Nuclear Safety Council (CSN) issued, in 2008, IS-19, the origin of which was in IAEA Safety Requirement No. GS-R-3 *"The Management System for Facilities and Activities"*. This Instruction, applicable from 1 January 2010 affects all nuclear facilities throughout the life cycle, that is, from site selection to dismantling and decommissioning. The biggest is the need for integration of requirements in all aspects of nuclear and radioactive safety, occupational risk prevention, environment, physical protection, quality and economic aspects to ensure the protection of people and of the environment.

23.1. Quality assurance at ENRESA facilities

Over the last three years, Quality Assurance activities have taken two forms: the implementation of the different developments required by Safety Instruction IS-19 and the activities for quality assurance of the project and design and construction of the Centralised Temporary Storage for Spent Fuel and High Level Waste (CTS) at Villar de Cañas.

In terms of the requirements of IS-19, a first activity focussed on compliance with two requirements of the integrated management manuals for the El Cabril Disposal Facility and the José Cabrera nuclear power plant. An integrated manual for the licensing and design of the CTS has also been prepared and applied.

On the other hand, also within the ambit of IS-19, a new self-assessment has been performed to identify the degree to which expectations in each of the processes and activities are being met. This tool is complementary to the independent internal quality assurance assessments, audits and inspections carried out regularly.

Also as a tool proposed by IS-19, an integrated corporate safety improvement system has been developed, called the SIM, which makes it possible for all personnel to participate in the identification of instances of non-compliance, corrective and preventive actions, improvement to facilities and corporate activities.

Finally, from the perspective of IS-19, the process of implementation of a strong safety culture based on eight principles defined by ENRESA was vitally important. In the year 2013, an independent assessment of the company's safety culture was carried out, and the information served for each corresponding team to define and implement an action plan to the year 2016. A self-assessment was carried out at that time, this time internal, where after analysis of the current situation, a new action plan was established to drive the culture of safety.

With regard to the design and construction project for the CTS at Villar de Cañas, the Quality Assurance Programme was reviewed in reference to Standard UNE 73.401 for the purpose of including a first estimate of provisions, construction, nuclear tests and operation. In addition, compliance with the additional requirement of IS-19 has also been included.

23.2. Inspection and assessment system for quality assurance programmes

There were no noteworthy changes in the standards and systems for assessing the quality assurance programmes applicable to the management of spent fuels and radioactive waste described in previous reports.

In the period covered by the Sixth Annual Report, assessment and inspection activities concerning the Quality Assurance Programmes have continued to be carried out, as have quality plans pertaining to the management of spent fuel and radioactive waste. These activities covered in this period, are related to:

- ✓ Licensing, such as design modification, new individualised temporary storage facilities (ITSs).
- ✓ Licensing process for the Centralised Temporary Storage (CTS).
- ✓ Licensing and amendment of design of spent fuel storage and transport casks.
- ✓ Modifications to design of already licensed facilities.
- ✓ Transport of radioactive material.
- ✓ Assessment activities.
- ✓ Quality Plan for design and construction of ITSs at the Santa María de Garoña and Almaraz nuclear power plants. The Assessment of the ITS at the Cofrentes nuclear power plant is planned for the year 2017.
- ✓ Preliminary request and construction of the CTS: Specifically, the documentation assessed for the CTS was:
  - ➪ Planned organisation for supervision of project and quality assurance throughout construction.
  - ➪ The part relating to Quality Assurance in the Integrated Management Manual for the project.
  - ➪ The Quality Assurance Project applicable to the different phases of the project (from characterisation to start-up of same).
  - ➪ The chapter of the Preliminary Safety Analysis (PSA) corresponding to the Quality Assurance of the project.
- ✓ Assessment of quality plans for the design and manufacture of casks for storage and/or transport of spent fuel: ENUN 52B (for Santa María de Garoña NPP) and ENUN 32P (generic, for Spanish PWR power plants).
- ✓ Assessment of aspects of quality guarantee corresponding to the modification of the design of the impact limiter of the Hi Star cask (transport cask).
- ✓ Assessment of the quality guarantee applicable to the following modification of design of the José Cabrera NPP relating to the management of radioactive waste from dismantling: (a) modification of soil washing design and (b) modification of design of the as storage site for Very Low Level Waste (VLLW).

Inspection activities

- ✓ Application of the Quality Assurance Programme for the dismantling of the José Cabrera NPP. In general, this inspection covers aspects such as:
  - ➪ Activities in the Area of Quality Assurance of the License Holder: inspections, audits and documentary reviews,
  - ➪ Supply of service and equipment,
  - ➪ Corrective Action Programme (CAP). Trend analysis, verification of the efficiency of actions, PAC indicators and assessment of the efficiency of same.

- ✓ Manufacture of TN 81 cask for transport of vitreous and compact waste. This cask designed by Areva already had a license issued by the French regulator: inspection focussed on the manufacture of the pieces contracted to the Spanish manufacturer ENSA. For the manufacture of casks, inspections focus on:
  - ➪ Organisational and training aspects and manufacture programme
  - ➪ Controls on the part of the licensee
  - ➪ Design modifications
  - ➪ Control of project documentation
  - ➪ Control of supplies and contracting
  - ➪ Reception of material and contracted sub-parts
  - ➪ Manufacture processes
  - ➪ Control of instances of non-compliance and Corrective Actions.
- ✓ Design of Centralised Temporary Storage. In general, quality assurance inspections of the design of the CTS cover:
  - ➪ Organisational aspects of the licensee
  - ➪ Contractors' quality plans for characterisation
  - ➪ Interrelations between the different participating engineering firms
  - ➪ Baseline data and baseline databases
  - ➪ Document control (design criteria, procedure, calculations, studies, plans and lists of equipment)
  - ➪ Design verification and design review
  - ➪ Supervision and control of works
  - ➪ Audits
  - ➪ Preparation of license documentation
- ✓ Transport of radioactive material: Independently of the specific checks carried out by the Transport area of the CSN on specific aspects of the quality assurance programmes of transporters, the Quality Assurance area carries out an inspection of a selected transporter every two years in order to analyse overall compliance of their quality assurance programme.

Article 24
Operational Radiation Protection

Article 24. Operational Radiation Protection

1. *Each Contracting Party shall take the appropriate steps to ensure that during the operating lifetime of a spent fuel or radioactive waste management facility:*

i) the radiation exposure of the workers and the public caused by the facility shall be kept as low as reasonably achievable, economic and social factors being taken into account;

ii) no individual shall be exposed, in normal situations, to radiation doses which exceed national prescriptions for dose limitation which have due regard to internationally endorsed standards on radiation protection;

iii) measures are taken to prevent unplanned and uncontrolled releases of radioactive materials into the environment.

2. Each Contracting Party shall take appropriate steps to ensure that discharges shall be limited:

i) to keep exposure to radiation as low as reasonably achievable, economic and social actors being taken into account; and

ii) so that no individual shall be exposed, in normal situations, to radiation doses which exceed national prescriptions for dose limitation which have due regard to internationally endorsed standards on radiation protection.

3. Each Contracting Party shall take appropriate steps to ensure that during the operating lifetime of a regulated nuclear facility, in the event that an unplanned or uncontrolled release of radioactive materials into the environment occurs, appropriate corrective measures are implemented to control the release and mitigate its effects.

The provisions in relation to radiation protection in Spanish regulation are mainly found in Law 15/1980, of 22 April, on the creation of the CSN and in the Regulation on health protection against ionising radiation (RPSRI), approved by Royal Decree 783/2001, of 6 July.

The Law Creating the Nuclear Safety Council assigned this Organisation the functions of supervising and controlling the levels of radioactivity, both within and beyond nuclear facilities and the Spanish fuel cycle, as well as the particular or cumulative incidence in the areas in which they are located, control of the doses received by operating personnel and of informing and advising the Government with respect to the commitments of other countries or international organisations in relation to nuclear safety and radiation protection.

The basic standards for the radiation protection of professionally exposed workers and the members of the public against the risks resulting from exposure to ionising radiations are established in RPSRI.

This Regulation transposes to the Spanish legislation the provisions of the European Union Directive 96/29/Euratom and implements the basic recommendations of ICRP-60.

The basic standards for the radiation protection of professionally exposed workers and members of the public against the risks resulting from exposure to ionising radiations also apply at facilities where spent fuel or radioactive waste is stored.

As an additional development of the provisions of this Regulation, the CSN has published various instructions that advise the licensees of nuclear power plants regarding the procedures to be adhered to in order to comply with some of these provisions: for greater detail see reports from previous years.

24.1. Workers Protection

24.1.1. Measures adopted to ensure exposure to radiation is maintained at the lowest level reasonably possible

The basic principles of justification, optimisation and limitation of the individual dosage are incorporated in the Spanish legislation in the aforementioned Regulation on health protection against ionising radiation.

The principle of optimisation, which is above the other two principles in the hierarchy, is the fundamental basis of current doctrine on radiation protection and is formulated in the following terms:

> *"The individual doses, the number of persons exposed, and the likelihood of incurring exposure shall be kept as low as reasonably achievable, economic and social factors being taken into account"*

The application of the principle of optimisation requires special attention being paid to radiation protection measures geared towards the prevention of exposure to radiation, which is fundamentally based on:

- ✓ The assessment (prior to the start-up) of radiation risk associated with all activities involving the use of ionising radiation.
- ✓ The radiological classification of the workers involved based on the radiological risk inherent in the work to be developed.
- ✓ The radiological classification of the places of work based on the predicted levels of radiation and contamination.
- ✓ The application of adequate standards of control for the different categories of workers exposed to the different places of work.

These measures are contained in the radiological protection manuals, which require the favourable approval of the Nuclear Safety Council.

24.1.2. Measures adopted to ensure that no individual shall be exposed, in normal situations, to radiation doses which exceed national prescriptions for dose limitation which have due regard to internationally endorsed standards on radiation protection

The RPSRI establishes the following dosage limits for workers exposed to nuclear facilities and the nuclear facilities and the Spanish fuel cycles:

- ✓ Effective dose limit: 100 mSv in five consecutive official years at a maximum effective dose of 50 mSv in any official year.
- ✓ Limit of skin dose (averaged over 1 cm^2): 500 mSv per official year.
- ✓ Limit of crystalline dose: 150 mSv per official year.
- ✓ Limit of dose on hands, forearms, skin and ankles: 500 mSv per official year.
- ✓ The control of radiation doses received by exposed workers is performed, for the most part, through individual monitoring using physical passive dosimeters. There are ca-

ses, nonetheless, in which if the radiation risk is sufficiently low, radiation monitoring in the working area may be sufficient.

The dosimetric monitoring of workers exposed to ionising radiations in Spain is regulated by the previously mentioned regulation, in which it is established that the individual dose must be measured by the Personal Dosimetry Service expressly authorised by the CSN.

The regulatory dispositions established by the RPSRI determine that all workers exposed must have a dosimetric history in which all doses received in the course of their professional duties are registered. These provisions assign to the licensee of the practise the responsibility for the archive of said history files until the worker reaches the age of 65 and never for a period of less than 30 years from the date of termination of the worker's employment.

In 1985, the CSN agreed the implementation in Spain of a National Dosimetry Bank (NDB) where all the personal dosimetry files for exposed workers at nuclear facilities and from the Spanish fuel cycle are centrally stored.

The NDB is managed by the CSN and at the end of the dosimetric year 2016, there were a total of 23,296,980 dosimetric measurements registered, for some 357,724 workers and some 73,091 facilities. Each of these measures includes associated information on the type of facility and the type of work carried out by the worker.

The number of individuals exposed to dosimetrically controlled ionising radiation in Spain in the year 2016 was 110,159.

Personal dosimetry

With respect to the dosimetric results corresponding to the year 2016 for all nuclear power plants, it must be pointed out that there were 9,071 exposed workers who carried out their activity in this area and were dosimetrically controlled. These dosimetric readings combined for a collective dose of 2,840 mSv. per person, with the average individual dose of this group of 0.93 mSv/year, with only workers with significant doses considered for this calculation. These data are broken down between direct staff and contract staff in table 6.

Table 6: Dosimetric results for the year 2006 for all nuclear power plants.

	TOTAL	EMPLOYED STAFF	SUBCONTRACTED STAFF
No. of exposed workers	9,071	2,094	7,025
Collective dose (mSv*person)	2,840	222	2,618
Average individual dose (mSv/year)	0.93	0.53	1

In the year 2016, there were 579 exposed workers performing activity in the Juzbado factory. The dosimetric readings combined for a collective dose of 55.57 mSv per person. If only workers with significant doses are considered, the average individual dose of this group was 0.56 mSv/year.

In the year 2016, there were 215 exposed workers performing activity at the El Cabril radioactive waste disposal facility. The dosimetric readings combined for a collective dose of 4.09 mSv per person. If only workers with significant doses are considered, the average individual dose of this group was 0.29 mSv/year.

24.2. Public Protection

The RPSI expressly requires the application of the ALARA philosophy to radiation protection for members of the public. This philosophy is applied to all phases of the licensing of Spanish nuclear facilities and so it is stated in the official documentation on the operation of each of these.

In terms of the dose limits, the RPSRI establishes the following dose limits for members of the public:

- ✓ An effective dose limit of 1 mSv per official year. Nevertheless, in special circumstances, one can authorise a higher value effective dose in an official year, provided that the average over five consecutive official year does not exceed the above value.
- ✓ Without prejudice to the above, an equivalent dose limit per official year of 15 mSv for crystalline and 50mSv for skin is set.

24.2.1. Limitation of discharges at nuclear facilities

In the permits for operation of all Spanish nuclear facilities, the system for the limitation, monitoring and control of radioactive effluent is established as part of the Operating Technical Specifications (OTSs).

At nuclear power plants, the detailed development of this system for the limitation, monitoring and control of radioactive effluent is included in the Off-site Dose Calculation Manual while at the El Cabril Disposal Facility, it is developed in the Specifications document itself.

At nuclear facilities, both during operation and when shut down, an effective dose limit of 0.1 mSv per year is applied for each unit on the site. This limit, which refers to consecutive 12-month periods, is applicable to all radioactive waste liquids and gases that are emitted.

Therefore, at the José Cabrera nuclear power plant, the dismantling of which was authorised on 1 February 2010, this rate remains applicable.

An interesting aspect is that at Spanish nuclear power plants, the water from spent fuel pools does not constitute a contribution to the radioactive liquid waste treatment system.

At the El Cabril disposal facility, the zero discharge criteria is applied for radioactive liquid, with only gaseous radioactive waste released into the environment, for which the discharge limit is an effective dose of 0.01 mSv over twelve consecutive months.

24.2.2. Verification of compliance with discharge limits

The licensees of Spanish nuclear facilities must estimate the critical individual dose for the public accumulated over twelve consecutive months, from the results of the programmes for the sampling and analysis of radioactive waste. This calculation is made in accordance with the MCDE methodology and based on conservative criteria with the aim of complying with the established limits.

From 2008, the accounting of the activities obtained through the application of said sampling and analysis programmes is carried out in accordance with the criteria from Recommendation 2004/2/Euratom, relating to the standardised information on gaseous and liquid radioactive effluents released into the environment by nuclear power plants and reprocessing plants in operation.

The results of the sampling and analysis programmes and the dose estimates and other data relevant to the effluents are issued monthly by the CSN.

In addition, in accordance with Article 53 of the RPSRI, the licensees estimate the reference group dose annually taking into account more realistic criteria. The reference groups chosen are considered equivalent to the typical groups as described in Publication ICRP-60.

In accordance with the OTSs, the licensees carry out the Environmental Radiation Monitoring Programmes (ERMPs) in the area of influence of nuclear facilities. Based on the results of these programmes, issued annually to the CSN, the real impact of discharges released into the environment can be established.

24.2.3. Discharge control

In accordance with the regulatory requirements, Spanish nuclear facilities have gaseous and liquid effluent treatment systems that allow for different types of radioactive waste generated during normal operation of the facilities to be gathered and processed and during operational incidents planned for.

The release of radioactive effluents into the environment must comply with the limits established, seeking to ensure it is as low as possible taking into consideration economic and social factors (IS-26).

In accordance with the RINR, licensees must implement a programme for continued improvement in accordance with the applicable standards, technological advances and operational experience. Specifically, Article 8.3 of said regulation establishes that the licensees must continuously ensure the improvement of radiation protection conditions of the facility and must analyse the existing technical and practical improvements in accordance with the requirements established by the Nuclear Safety Council and implement those considered appropriate by said body.

In addition, the licensees of nuclear power plants must carry out a Periodic Safety Review on the basis of a period of ten years where:

- ✓ the overall performance of the facility is analysed,
- ✓ it is demonstrated that the lessons learned from the operational experience have been implemented correctly, and
- ✓ it is assessed if the relevant changes introduced at new generation plants are applicable to the facility.

Therefore, the Spanish regulatory system in the area of control of radioactive effluents constitutes the suitable framework for the effective implementation of a clearly defined policy in which the implementation of applicable technological advances is required, complying with the requirements and recommendations of the competent international bodies and incorporating the necessary measures to ensure discharges are limited and the impact on the public and the environment is limited.

Discharges in the years 2014, 2015 and 2016 from Spanish nuclear power plants and the El Cabril disposal facility are summarised in Tables 7 and 8 respectively.

In the case of the José Cabrera nuclear power plant, the effluents released into the environment are generated as a result of the tasks being carried out during the dismantling phase.

These discharges represent minimum risk to members of the public and the population as a whole, as seen in the dosage of the discharges of the three years analysed, which do not exceed 4% in the case of Spanish nuclear power plants and 7.6% in the case of the El Cabril disposal facility, of the discharge limit in each case.

Table 7: Activity of radioactive effluents at the nuclear power plants (Bq).

	PWR power plants						BWR power plants	
	José Cabrera NPP	Almaraz I and II NPP	Ascó I NPP	CN Ascó II NPP	Vandellós II NPP	Trillo NPP	Sta Mª Garoña NPP	Cofrentes NPP
Liquid effluents								
Year 2014								
Total except tritium and dissolved gases	$4{,}53\ 10^{8}$	$1{,}03\ 10^{10}$	$5{,}28\ 10^{9}$	$4{,}29\ 10^{9}$	$4{,}33\ 10^{9}$	$3{,}76\ 10^{8}$	$6{,}05\ 10^{7}$	$1{,}10\ 10^{8}$
Tritium	$7{,}43\ 10^{10}$	$2{,}66\ 10^{13}$	$2{,}53\ 10^{13}$	$3{,}20\ 10^{13}$	$2{,}25\ 10^{13}$	$2{,}01\ 10^{13}$	$4{,}74\ 10^{11}$	$6{,}64\ 10^{11}$
Dissolved gases	- -	$3{,}77\ 10^{9}$	$2{,}68\ 10^{9}$	$2{,}17\ 10^{7}$	$1{,}66\ 10^{7}$	-4	ND	$5{,}84\ 10^{6}$
Year 2015								
Total except tritium and dissolved gases	$1{,}52\ 10^{8}$	$5{,}38\ 10^{9}$	$2{,}51\ 10^{9}$	$2{,}64\ 10^{9}$	$6{,}68\ 10^{9}$	$3{,}25\ 10^{8}$	$3{,}91\ 10^{7}$	$3{,}51\ 10^{8}$
Tritium	$1{,}40\ 10^{11}$	$4{,}30\ 10^{13}$	$2{,}47\ 10^{13}$	$1{,}56\ 10^{13}$	$9{,}92\ 10^{12}$	$1{,}47\ 10^{13}$	$1{,}81\ 10^{11}$	$9{,}85\ 10^{11}$
Dissolved gases	- -	$7{,}20\ 10^{7}$	$4{,}56\ 10^{8}$	$2{,}07\ 10^{7}$	$1{,}16\ 10^{8}$	-4	ND	$4{,}20\ 10^{7}$
Year 2016								
Total except tritium and dissolved gases	$6{,}20\ 10^{6}$	$9{,}78\ 10^{9}$	$1{,}79\ 10^{9}$	$4{,}08\ 10^{9}$	$4{,}78\ 10^{9}$	$5{,}61\ 10^{8}$	$3{,}95\ 10^{7}$	$1{,}98\ 10^{8}$
Tritium	$5{,}52\ 10^{9}$	$3{,}41\ 10^{13}$	$1{,}54\ 10^{13}$	$2{,}19\ 10^{13}$	$3{,}84\ 10^{13}$	$1{,}77\ 10^{13}$	$8{,}26\ 10^{10}$	$8{,}95\ 10^{11}$
Dissolved gases	- -	$6{,}28\ 10^{9}$	$1{,}02\ 10^{8}$	$3{,}47\ 10^{7}$	ND	-4	ND	$1{,}27\ 10^{8}$
Gaseous effluents								
Year 2014								
Noble gases	- -	$2{,}60\ 10^{12}$	$1{,}84\ 10^{13}$	$1{,}05\ 10^{11}$	$1{,}71\ 10^{10}$	$2{,}59\ 10^{11}$	ND	$5{,}58\ 10^{12}$
Halogens	- -	$4{,}59\ 10^{5}$	$4{,}25\ 10^{6}$	ND	$1{,}56\ 10^{5}$	ND	- -	$2{,}10\ 10^{8}$
Particles	$6{,}91\ 10^{5}$	$8{,}38\ 10^{5}$	$8{,}54\ 10^{6}$	$6{,}68\ 10^{6}$	$1{,}94\ 10^{6}$	ND	$8{,}3910^{5}$	$6{,}24\ 10^{6}$
Tritium	$10{,}01\ 10^{9}$	$4{,}16\ 10^{12}$	$3{,}57\ 10^{11}$	$4{,}69\ 10^{11}$	$4{,}06\ 10^{11}$	$6{,}56\ 10^{11}$	$4{,}6010^{11}$	$1{,}40\ 10^{12}$
Carbon-14	- -	$3{,}72\ 10^{11}$	$1{,}24\ 10^{11}$	$2{,}54\ 10^{11}$	$3{,}93\ 10^{11}$	$8{,}24\ 10^{10}$	- -	$4{,}73\ 10^{11}$

				Year 2015				
Noble gases	- -	$2{,}07\ 10^{12}$	$6{,}12\ 10^{11}$	$6{,}16\ 10^{10}$	$2{,}22\ 10^{10}$	$1{,}08\ 10^{11}$	ND	$1{,}74\ 10^{13}$
Halogens	- -	$6{,}64\ 10^{4}$	ND	ND	$2{,}76\ 10^{6}$	ND	- -	$3{,}77\ 10^{9}$
Particles	$5{,}46\ 10^{5}$	$1{,}55\ 10^{6}$	$5{,}78\ 10^{6}$	$8{,}39\ 10^{6}$	$4{,}45\ 10^{7}$	ND	$8{,}90\ 10^{5}$	$4{,}08\ 10^{7}$
Tritium	$3{,}70\ 10^{9}$	$5{,}29\ 10^{12}$	$5{,}96\ 10^{11}$	$7{,}31\ 10^{11}$	$2{,}60\ 10^{11}$	$5{,}91\ 10^{11}$	$3{,}43\ 10^{11}$	$2{,}87\ 10^{12}$
Carbon-14	- -	$3{,}70\ 10^{11}$	$1{,}06\ 10^{11}$	$1{,}19\ 10^{11}$	$1{,}32\ 10^{11}$	$1{,}43\ 10^{11}$	- -	$2{,}00\ 10^{11}$
				Year 2016				
Noble gases	- -	$1{,}27\ 10^{12}$	$1{,}65\ 10^{11}$	$3{,}55\ 10^{10}$	$1{,}28\ 10^{10}$	$1{,}57\ 10^{11}$	ND	$1{,}27\ 10^{13}$
Halogens	- -	$4{,}33\ 10^{1}$	ND	ND	$5{,}21\ 10^{5}$	ND	- -	$2{,}8210^{8}$
Particles	$9{,}62\ 10^{4}$	$1{,}30\ 10^{6}$	$2{,}14\ 10^{6}$	$4{,}79\ 10^{6}$	$3{,}59\ 10^{7}$	ND	$1{,}57\ 10^{6}$	$1{,}18\ 10^{7}$
Tritium	$1{,}78\ 10^{9}$	$8{,}91\ 10^{12}$	$5{,}55\ 10^{11}$	$5{,}0110^{11}$	$2{,}24\ 10^{11}$	$5{,}04\ 10^{11}$	$2{,}44\ 10^{11}$	$1{,}88\ 10^{12}$
Carbon-14	- -	$2{,}04\ 10^{11}$	$1{,}64\ 10^{11}$	$1{,}85\ 10^{11}$	$4{,}97\ 10^{10}$	$1{,}49\ 10^{11}$	- -	$3{,}39\ 10^{11}$

Table 8: Activity of gaseous radioactive effluents at El Cabril (Bq).

	TOTAL ALFA	TOTAL BETA	GAMMA	TRITIUM	CARBON-14
Year 2014	9.04 103	5.00 103	ND	2.70 108	5.88 107
Year 2015	2.62 104	1.02 105	ND	1.51 108	2.03 108
Year 2016	1.88 104	6.92 104	ND	4.43 106	7.92 107

ND = Not Detected

24.2.4. Unplanned or uncontrolled discharges

To prevent unplanned or uncontrolled discharges of radioactive material into the environment, Spanish nuclear facilities use:

- ✓ Monitoring instrumentation that allows for detection of these discharges
- ✓ Devices for isolation of discharges in the case of exceeding pre-established values
- ✓ Activation of alarms in the case of detecting abnormal conditions
- ✓ Administrative controls

Nevertheless, if in spite of these measures an uncontrolled or unplanned discharge occurs, the licensees of the nuclear facilities must adopt the measures necessary to stop or control the discharge if possible and minimise its impact on the exterior. Similarly, they must identify the cause or causes behind it and define the actions to be taken to prevent it from occurring again. All these aspects must be notified to the CSN for analysis and approval.

The ERMPs which are carried out by the licensees of nuclear power plants allow for the identification of increases in environmental activity arising from said discharges and checking of the efficiency of the measures adopted to mitigate their effects.

Article 25
Preparation for emergency cases

Article 25. Emergency Preparedness

1. *Each Contracting Party shall ensure that before and during operation of a spent fuel or radioactive waste management facility there are appropriate on-site and, if necessary, off-site emergency plans. Such emergency plans should be tested at an appropriate frequency.*
2. *Each Contracting Party shall take the appropriate steps for the preparation and testing of emergency plans for its territory insofar as it is likely to be affected in the event of a radiological emergency at a spent fuel or radioactive waste management facility in the vicinity of its territory.*

The aspects related to the national emergency structure, such as the assignment of responsibilities, the legislative and regulatory framework, emergency preparedness measures, the role of the regulatory body, etc. are described in Annex C of this Report.

In this section, the principal changes or actions that have taken place in the period of the Report are summarized.

25.1 Legislative and regulatory framework for emergency situations

- ✓ Royal Decree 1054/2015 of 20 November approved the State Plan for Civil Protection from Radiological Risk (PERR, as per the Spanish acronym) required by Royal Decree 1564/2010 approving the Basic Directive on Civil Protection against Radiological Risk. At the same time the CSN prepared and sent to the Directorate General for Civil Protection and Emergencies on 29 April 2016 a Plan on the evaluation, measurement and radiological control in the PERR and which develops how the CSN complies with the missions assigned in a nuclear or radiation emergency and which are contained in sections f) and r) of Article 2 of Law 15/1980 creating the CSN.
- ✓ The Special Plan Against Radiological Risk in the Autonomous Community of Castilla-La Mancha (RADIOCAM) prepared to comply with the DBRR mentions the Centralised Temporary Storage (CTS). However, the current licensing situation of same does not require, based on current regulation, that the On-site Emergency Plan (OSEP) be approved.
- ✓ While there is no radiological risk at present, when this is built and before its operation, the coordination of the CTS On-site Emergency Plan with RADIOCAM must be reviewed.
- ✓ Royal Decree 177/2015 of 13 March modifies the Regulation in nuclear and radioactive facilities for the adaptation to Law 20/2013 of 9 December, guaranteeing market unity. Specifically, in Article 2 Section 3 it states:

"The authorisations for operation for Category 2 and 3 radioactive facilities shall be valid for the entire Spanish territory. Without prejudice to the above, the licensee who is going to carry out any activity for an authorisation, in a specific part of the territory must assume a communication to the competent territorial administration, initiating their activity from said communication".

25.2 Application of emergency preparedness, including the role of the regulatory body and other entities

✓ Level of Internal Responsibility

In the period of this report, the On-site Emergency Plans have been reviewed, to include the results of the analysis of the Emergency Response Organisations (EROs) considering a new methodology agreed with licensees that takes into account criteria included in various publications of the American Nuclear Energy Institute (NEI). As a result of this analysis, the EROs of Spanish nuclear power plants have new shift posts, new retention posts, or both.

The Military Emergency Unit (MEU) has signed protocols for collaboration with the Spanish Electrical Industry Association (UNESA) for intervention in extremely serious emergency situations at Spanish nuclear power plants. In this sense, all of the IEPs for Spanish nuclear power plants have been reviewed to include the intervention of the MEU as potential off-site support for EROs in these extremely serious scenarios.

Similarly, there is an Emergency Support Centre (ESC), located close to Madrid which can assist any nuclear power plant in the event of a major accident, providing additional equipment and personnel to tackle such emergency. The IEPs of all Spanish nuclear power plants include a new centre for emergency management, referred to as CAGEs. This alternative centre has the same plant information as the Technical Support Centre and from there the same emergency management functions as performed from the TSC, as it has a better location and seismic resistance and autonomy of over 72 hours and has the conditions for radiological habitability. In addition to the TSC staff, it can also house medical service staff, radiation control staff and it has a small storage space for emergency response equipment and a laboratory for analysis of samples from any accident. It also has logistical infrastructure and rest areas for ERO staff with a capacity for 70 persons at sites with a single reactor and for 120 at sites with two reactors.

✓ Level of External Responsibility

For emergencies managed under the Basic Directive on Civil Protection against Radiological Risk, the CSN has reported favourably on the Special Plans against Radiological Risk of the Autonomous Community of Castilla-La Mancha and the Regional Government of Extremadura (RADIOCAEX), presented, respectively, by the Departments of the Presidency and Public Administration of Castilla-La Mancha and of Public Administrations of the Government of Extremadura in accordance with the provisions of the DBRR.

25.3 Preparedness and response to emergency situations

To comply with the missions entrusted to the CSN by law in emergencies and contained in the Emergency Action Plan of the CSN, units and groups of personnel for one hour response have been increased.

All nuclear facilities continue to carry out mandatory on-site emergency drills, developing complex scenarios that allow for the operability of the IEPs to be checked in the event of a hypothetical accident postulated for each facility.

25.4. Arrangements on the international level, including with neighbouring countries, as necessary

In the bilateral agreement between the CSN and the ASN (the French nuclear regulator) in relation to emergencies, among other objectives is that of both organisations to inform of any nuclear or radiological accident that might occur in any part of the territory that might affect any part of the national territory or which might cause concern among its citizens.

This cooperation between the CSN and ASN took the form of a protocol for rapid exchange of information, developed for this purpose and which in this period has been put in practice by both organisations, taking advantage of emergency drills at nuclear power plants.

On 30 July 2014, and within the framework for collaboration in place between the governments of Spain and Portugal, the Technical Cooperation Protocol was signed between the CSN and the Portuguese Agency for the Environment, National Authority for Civil Protection and the Higher Technical Institute of the University of Lisbon, in the area of nuclear and radiological emergencies and radiological protection of the environment.

On 28 June 2015, Spain performed the INEX 5 exercise, promoted by the Nuclear Energy Agency (NEA), which was led by the CSN with the participation of staff from almost all the competent authorities in Spain, an observer from the Portuguese Environment Agency and Cofrentes NPP, which simulated an accident to reach the source term established by the NEA. The objective was to provide the basis for improvement of the provisions for the management of national and international emergencies, in aspects relating to notification, communication and obtaining resources through the exchange of results and the experience obtained in the different participating countries.

The deficiencies and best practice processes were presented at a recent workshop held at the NEA headquarters and attended by almost all the countries participating in INEX 5.

The CSN has participated in the meetings of the HERCA group on emergencies (WGE) which echoed the concerns expressed by the mutual assistance group on emergencies of WENRA.

While in the earliest phase of an accident the uncertainties around the accident and the potential radiological impact are significant, emergency managers must make decisions in relation to protection. This requires great flexibility in decision. In this sense, the HERCA WGE has proposed, for countries which are affected by a nuclear accident, coordination of the decisions and the response mechanism for the early phase of an accident, which the HERCA-WENRA group has called the Common Situation Report or Common Approach, based on the following principles:

- ✓ Mutual understanding and trust
- ✓ Coordination of activities
- ✓ Alignment of recommendations between neighbouring countries

The objective is to develop mechanisms that allow for protection measures to be implemented during an emergency in a manner that is consistent along common borders between countries without having to change the procedures of either country.

Article 26
Decommissioning

Article 26. Decommissioning

Each Contracting Party shall take the appropriate steps to ensure the safety of decommissioning of a nuclear facility. Such steps shall ensure that:

i) qualified staff and adequate financial resources are available;

ii) the provisions of Article 24 with respect to operational radiation protection, discharges and unplanned and uncontrolled releases are applied;

iii) the provisions of Article 25 with respect to emergency preparedness are applied; and

(iv) records of information important to decommissioning are kept

In accordance with the Nuclear and Radioactive Facilities Regulation (RINR), dismantling is

> *"the process by which the licensee of a facility, once the corresponding authorisation has been obtained, carries out decontamination, disassembly of equipment, demolition of structures and removal of materials to allow, ultimately, for the full or restricted liberation of the site. The dismantling process ends with a declaration of decommissioning, which releases the licensee from their responsibility as operator of same and defines, in the case of restricted liberation of the site, the limits of uses applicable and the body responsible for their maintenance and ensuring compliance."*

The information on the licensing process for the dismantling of nuclear facilities is contained in Annex B of this Report.

26.1. Organisation and responsibilities of dismantling

The dismantling and decommissioning of nuclear facilities in Spain constitutes an essential public service which is assigned to Empresa Nacional de Residuos Radiactivos S. A. ENRESA by Article 38 bis of Law 25/1964, the Nuclear Energy Act. ENRESA shall act as the licensee of operation relating the dismantling and decommissioning of nuclear facilities and, where necessary, radioactive facilities.

In accordance with the RINR, when the authorisation to operate a nuclear facility is granted, the responsibility for decommissioning is assumed by the licensee of the facility who, before the concession of the corresponding authorisation, must assume responsibility for the activities prior to the dismantling of same. Before granting the authorisation for dismantling, the licensee of the authorisation to operate must condition radioactive waste generated during operation in accordance with the acceptance criteria of the storage facility to which it is to be transferred. Secondly, the licensee of the facility must assume responsibility for fuel in the reactor and in the irradiated fuel storage pools or, otherwise, provide a spent fuel management plan approved by MINETAD.

Once the licensee of the facility has concluded the activities prior to the aforementioned dismantling, the facility must be transferred temporarily to ENRESA to proceed with its dismantling. The obligations and requirements involved in such a transfer of license are established in detail in a contract between ENRESA and the owners of nuclear facilities, which is also approved in advance by MINETAD.

The organisation and responsibility of ENRESA as licensee of the facilities in the process of dismantling are legally defined by the RINR itself.

26.2. Financing of dismantling

In general, the financing of the dismantling and decommissioning of nuclear facilities has not undergone changes with respect to that reported in the previous National Report. For more details of the system, see Annex D.

26.3. Radiation protection and emergency during dismantling

As described in the previous National Report, the nuclear facilities in the dismantling phase remain considered nuclear facilities until the declaration of decommissioning of same is provided and submitted to the RINR. In this respect, the standards signalled in the section on compliance with the provisions of Articles 24 *«Operational Radiation Protection»* and 25 *«Preparation for Emergency Cases»* of this Convention are applicable.

26.4. Document file for dismantling and decommissioning

The RINR established the obligation of nuclear licensees to gather and conserve adequately all the information pertaining to the operation phase. This regulation also requires that every authorised nuclear facility has in place the provisions for the dismantling and decommissioning of the facility described, including, among others, those relating to final management of the radioactive waste generated and the study of the costs and economic and financial forecasts to guarantee decommissioning (Article 20 J of the RINR).

The agreements for transfer of the license contractually establishes the mechanisms and procedures that allow ENRESA access to all operation files at the facility. Thus, ENRESA can use all the available information they consider relevant for the design and execution of the dismantling and decommissioning plan of same.

This page blank

Section G

Safety of management of spent nuclear fuel

Section G. Safety of management of spent nuclear fuel

This section covers the obligations provided for in Articles 4-10 of the Convention.

Article 4
General Safety Requirements

Article 4. General Safety Requirements

Each Contracting Party shall take the appropriate steps to ensure that at all stages of spent fuel management, individuals, society and the environment are adequately protected against radiological hazards.

In so doing, each Contracting Party shall take the appropriate steps to:

(i) ensure that criticality and removal of residual heat generated during spent fuel management are adequately addressed;

(ii) ensure that the generation of radioactive waste associated with spent fuel management is kept to the minimum practicable, consistent with the type of fuel cycle policy adopted;

(iii) take into account interdependencies among the different steps in spent fuel management;

(iv) provide for effective protection of individuals, society and the environment, by applying at the national level suitable protective methods as approved by the regulatory body, in the framework of its national legislation which has due regard to internationally endorsed criteria and standards;

(v) take into account the biological, chemical and other hazards that may be associated with spent fuel management;

(vi) strive to avoid actions that impose reasonably predictable impacts on future generations greater than those permitted for the current generation;

(vii) aim to avoid imposing undue burdens on future generations.

Spent fuel produced at Spanish nuclear facilities is first stored in the pools of the reactors. When the capacity of these is no longer sufficient, the fuel is transferred to dry storage facilities (ITS) built on-site at the power plants. As of the date of this report, there are ITS facilities at the Trillo, José Cabrera (plant in dismantling phase) and Ascó nuclear power plants. The entry into operation of new facilities of this kind is also planned at the Garoña and Almaraz plants (both in construction phase) and Cofrentes plant. In the two former, dual-purpose metallic casks are used. In the section pertaining to Article 7.3 of this Report more detailed information is provided on the technologies applied.

ITS facilities which are in operation use dry storage casks: dual purpose metallic casks, approved for storage and transport in the case of the Trillo NPP and concrete and metal casks in the case of José Cabrera and Ascó.

Storage facilities for spent fuel are nuclear facilities or part of nuclear facilities and are governed by the general legal and regulatory framework applicable to such facilities (See Annex A) and constituted basically by Law 25/1964 the Nuclear Energy Act and Royal Decree 102/2014 on Responsible and Safe Management of Spent Nuclear Fuel and Radioactive waste and the Nuclear and Radioactive Facilities Regulation (RINR), the Regulation on health protection against ionising radiation (RPSRI), and environmental legislation, in addition to the following Safety Instructions issued by the CSN:

- ✓ Instruction IS-20 establishing the safety requirements relating to spent fuel storage casks, published on February 18 2009.
- ✓ Instruction IS-19 on basic requirements of the management system of nuclear installations, published on 8 July 2010.
- ✓ Instruction IS-29 on safety criteria at spent fuel and high-level radioactive waste storage facilities, published on 2 November 2010.

These instructions incorporate the requirements of the IAEA and the WENRA reference levels and, in the case of IS-26, the safety requirements of Council Directive 2009/71/Euratom on nuclear safety.

4.1. Measures to guarantee maintenance of subcritical conditions and heat removal

Maintenance of the conditions subscribed and adequate heat removal from temporary spent fuel storage systems and facilities are safety requirements, which are incorporated through the application of technical and administrative control systems, subject to analysis, assessment and monitoring.

The measures adopted by licensees of facilities for compliance with these requirements are described in the Safety Analyses, the official document presented with the request for authorisations for the facility's different phases and in the Operating Technical Specifications, also a compulsory document for the operation of nuclear facilities.

These measures take into account the established criteria in the technical standards of the IAEA, in addition to the regulation in the country of origin of the technology (US NRC 10CFR 50 in the case of spent pools and US NRC 10 CFR 72 in the case of dry storage systems and installations). These criteria and requirements have been incorporated into national law through the Instructions of the Nuclear Safety Council cited above, in particular IS-20 and IS-29.

4.1.1. Measures to guarantee maintenance of the subcritical conditions

The criteria and methods employed for the maintenance of subcritical conditions at spent fuel storage facilities have not changed since the last report of the Joint Convention. The design criterion adopted for the maintenance of subcritical conditions (both in pools and in dry storage casks) is that the neutron multiplication factor (Keff), including all biases and uncertainties with a level of confidence of 95%, be lower than 0.95 under normal operating, abnormal or accident conditions.

For this purpose, the methods used are the following:

- ✓ The maintenance of a secure geometric configuration, the use of fixed or dissolved neutron poisons (except in BWRs), the limitation of initial enrichment and credit for the burn-upgrade of fuels, in pools or nuclear reactors.
- ✓ In the case of dry storage casks used in ITS facilities, the maintenance of subcritical conditions is based on the geometry of the basket which houses the fuel, the presence of neutron absorbent materials as an inherent part of the rack or fixed to same and in the administrative limits on enrichment of fuel in U-235 and burn-up.
- ✓ In the case of the planned CTS facility, the measures to prevent the criticality of the design chosen are based on the maintenance of geometry favourable for the storage canisters and the limitation of the number of fuel elements by canister, the consideration of security margins for the parameters that determine criticality in accordance with the uncertainty of data and methods of analysis.

4.1.2. Measures to guarantee adequate heat removal

The refrigeration system of spent fuel storage pools at the plants removes the heat generated without exceeding the temperature limits established and maintains a minimum level of water above the fuel elements that guarantees adequate shielding in any situation. The re-racking in all pools at the plants and the "stress tests" performed after Fukushima forced the analysis and calculation of residual heat and the revaluation of the existing refrigeration systems.

The ITS storage casks at the nuclear power plants are designed to direct to the environment the heat generated by the fuel elements through passive mechanisms of convection, conduction and radiation. The evacuation of the heat from the dual purpose metallic casks is facilitated by the structure of the cask itself which aids conduction of heat to the exterior, evacuated at the same time through convection and radiation.

In the case of the ITS facilities at José Cabrera and Ascó, the casks are fitted with a metal and concrete structure ventilated by natural convection which allows for the cooling of the canister housed within. This latter also has an inner structure which facilitates conduction of the heat to the exterior and the convection of the inert gas within.

The design of the CTS facilities allows for ventilation through a refrigeration system by natural convection of air respecting the temperature limits of the system (spent fuel cladding, metals of the storage capsule-tube and structural concrete). The external air will enter through air intakes, will be directed to the lower plenum of the vault and will circulate through the interior of the double sleeve that surrounds the storage tubes. The hot air will flow into the upper plenum of the vault before being discharged to the exterior through the chimney.

4.2. Measures to ensure that the generation of radioactive waste arising from the management of spent fuel is maintained at as low a level as possible

Minimising the waste generated is a principle included in the legal framework for nuclear energy (Article 38 of the Nuclear Energy Act). It is also a principle of waste management established by the new Directive 2011/70/Euratom (Article 4) and contained in Royal Decree 102/2014 (Article 3a) which transposes the Directive into Spanish legislation.

In wet spent fuel storage systems or pools, minimising waste is aimed at reducing, where possible, the secondary waste produced in the process of purifying the water and filters of cleaning and ventilation systems for air in buildings where these are stored. The criteria for minimising waste estab-

lished as a general requirement for nuclear facilities are applied equally in the design of facilities for temporary dry storage of spent fuel and the processes associated with loading the fuel.

4.3. Measures to take into account interdependencies among the different steps in spent fuel management

Consideration of the interdependencies between the different phases of the management of radioactive waste and spent fuel is an element that has formed part of the Spanish legal and regulatory framework for a number of decades. After the adoption of Directive 2011/70/Euratom, this consideration has been reinforced after being introduced as a governing principle of national policies following Article 4.3.b. of the Directive. In accordance with this, Royal Decree 102/2014 also introduces the consideration of said interdependencies as one of the general principles in the application of the standard on radioactive waste and spent fuel (Article 3.b.).

Similar wording can be found in CSN Instruction IS-26, of 16 June 2010 on basic nuclear safety requirements applicable to nuclear installations, referring to the management of radioactive waste (point 7.22):

> *The licensee of the nuclear installation shall ensure that, when decisions are made during the different radioactive waste management stages, the interactions and relations with other stages are previously identified and acknowledged such that a well-balanced compromise between safety and overall effectiveness is reached.*

In practice the fundamental measure for the implementation of this principle is made through the adoption of the Radioactive Waste and Spent Fuel Management Plan (RWMP), an official document for the operation of nuclear facilities, approved by MINETAD subject to a prior report from the CSN within the process for licensing a facility. The objectives, criteria and content of these plans are regulated by the CSN's Safety Guide 9.03 of 2008. Consequently, the plans for management of fuel and waste from operating nuclear power plants have been reviewed by the licensees of same for their adaptation to the guide. These plans have been assessed and approved by the CSN.

A direct reflection of the consideration of the interdependencies will be the adoption of the acceptance criteria for radioactive waste and spent fuel at the future CTS operated by ENRESA, the preparation of which is currently in progress. In this sense, the introduction of the new Royal Decree transposing the Directive from the following article:

> *Article 11. Technical-administrative specifications of acceptance.*
>
> 1. *The licensees of nuclear and radioactive facilities shall be obliged to subscribe the technical-administrative specifications of acceptance of their spent nuclear fuel and radioactive waste, with a view to its collection and subsequent management by ENRESA.*
> *(...)*
> 3. *In said specifications it shall be established the monitoring period which extends until the end of the life of facilities, including dismantling and decommissioning, or closure of the nuclear facilities and, where applicable, radioactive facilities.*
> 4. *These specifications must be approved by the Ministry of Industry, Energy and Tourism, with the preliminary report of the Nuclear Safety Council.*

The standard contracts established with the licensees of nuclear facilities in relation to spent fuel and high level waste and special waste, are considered technical-administrative specifications of acceptance.

Finally, it must be pointed out that, among ENRESA's reporting obligations to the CSN, introduced by the new Royal Decree, is the issuing, during the first quarter of each year, of information on interdependencies in accordance with the interfaces of competencies with licensees of other facilities for the management of nuclear fuel and radioactive waste (Article 12.2 of Royal Decree 102/2014).

4.4. Measures for the protection of persons, society and the environment

The provisions for the protection of persons and the environment against the risks arising from nuclear and radioactive facilities are contained in the existing legal framework in Spain, in accordance with Sections E and F of this Report. These provisions apply both to spent fuel storage facilities associated with nuclear power plants and independent spent fuel storage facilities.

The general measures adopted in relation to the protection of workers, and those pertaining to control and monitoring of effluents and the optimisation of radiological protection at nuclear facilities, were previously referred to in Article 24 of this Report. In the ambit of the management of spent fuel and, specifically, that of spent fuel and high level waste storage facilities, the basic criteria for the protection of workers is contained in Article 38 of Law 25/1964, the Nuclear Energy Act, developing the Regulation on health protection against ionising radiation.

In terms of radiation protection measures for persons, society and in the case of spent fuel management and storage facilities, these are developed in Articles 6, 7, 8 and 9 of this Report and in Article 25 for emergency management.

In terms of environmental protection measures, these are governed by the national standards for environmental impact assessment, specifically Law 21/2013, of 9 December, in environmental assessment, which incorporates Directive 2001/42/EC, of 27 June, on the assessment of the effects of certain plans and programmes on the environment, and Directive 2011/92/EU of 13 December on the assessment of the effects of certain public and private projects on the environment.

In Spain, Individualised Temporary Storage Facilities located on-site at the Trillo, José Cabrera and Ascó nuclear power plants have undergone Environmental Impact Assessment (EIA) and obtained the corresponding Environmental Impact Declaration (EID). Similarly, the ITS facilities planned at Santa María de Garoña and Almaraz have obtained their Environmental Impact Declaration and the future ITS at Cofrentes NPP and the planned centralised temporary storage (CTS) facility at Villar de Cañas (Cuenca) will also obtain the corresponding Environmental Impact Declarations.

With regard to the CTS, the assessment of radiological impact on the public in normal operation has been carried as a preliminary step towards the Environmental Impact Declaration.

4.5. Measures to take into account the biological, chemical and other hazards that may be associated with spent fuel management

The prevention of biological, chemical and other risks other than radiological ones associated with the management of spent fuel is regulated by the regulation common to other industrial activities with these types of risks. It is fundamentally based on the environmental impact assessment legislation. The authorisation of spent fuel management facilities requires an environmental impact assessment that takes these risks into account.

For his part, the prevention of non-radiological risks to operative staff at these facilities is regulated by Law 31/1995 on occupational risk prevention.

In this sense, it is also important that the provisions of the CSN Safety Guide No 1.6 on Reportable Events at Nuclear Power Plants, which require that events judged by the licensee of same to have significant public repercussions (including environmental variations and workplace accidents) must be reported to said body.

4.6. Measures to prevent greater repercussions on future generations than present generations

It is forecast that the interim storage of spent fuel, whether in casks in ITS facilities or at the CTS will last several decades. The robustness and security of these storage systems is achieved through strict compliance with the standards during siting, design, construction and operation, subject to a regulatory framework for licensing and supervision on the part of the regulatory body. The national policy in relation to management of spent fuel includes the different phases necessary for the temporary storage up until disposal in a deep geological repository and the financial technical and research forecasts. This long-term management policy ensures that fuel and waste rest permanently isolated from the environment protecting present and future generations. Nevertheless, as has been mentioned in the previous section, considering that fuel and waste management activities can involve various responsible parties and cover longer periods, Article 38 of the Nuclear Energy Act, in reference to the measures to be taken by organisations responsible for nuclear facilities indicate that these must adopt the appropriate measures in all phases of management of spent nuclear fuel and radioactive waste, for the purpose of adequately protecting people, objects and the environment both in the present and the future.

4.7. Measures to avoid imposing undue burdens on future generations

The regulatory framework in Spain establishes, through Law 25/1964, the Nuclear Energy Act, Law 54/1997 on the electricity sector and Royal Decree 102/2014 for the responsible and safe management of spent nuclear fuel and radioactive waste, the specific measure for this purpose, related to the assignment of responsibilities, the provision of funds for the financing of activities provided for in the GRWP and the forecasts for needs of industrial control.

The legislation establishes the responsibility of the different agents involved in the management of spent fuel: Ministry of Energy, Tourism and the Digital Agenda, Regulatory Body (CSN), producers and ENRESA, as detailed in Articles 20 and 21 of this Report and elsewhere.

In relation to this section, the legal framework is provided by the constitution, application and mechanisms for the management and guarantee of the Fund established for the financing of these activities of GRWP, among them spent fuel management, the details of which can be found in Annex D. Through the provisions of said Fund, the generation that benefits from the production of the original nuclear electricity pays the costs associated with the fuel generated until its final disposal.

The Law on Nuclear Energy also establishes that the State shall become the licensee of spent fuel once it has been placed in disposal and shall also assume responsibility for monitoring which, where necessary, may require the closure of a nuclear facility once the period established for the corresponding authorisation has elapsed.

In this sense, Directive 2011/70/Euratom highlighted the ethical obligation of each Member State to avoid placing on future generations any undue burden arising from spent nuclear fuel and established the community framework to protect this principle.

In line with the Directive, Royal Decree 102/2014, which saw its transposition into Spanish law, aims at

> *"the regulation of responsible and safe management of spent nuclear fuel and radioactive waste where they arise from civil activities, in all their phases , from generation to disposal, for the purposes of avoiding the imposition on future generations of undue burdens, and the regulation of some aspect relating to the financing of these activities in accordance with the community framework".*

As a result of the above and in accordance with Royal Decree 102/2014, the next General Radioactive Waste Plan must include in its content

> *"the concepts or plans for the period subsequent to the operational phase of a disposal facility, indicating the period of time for which the pertinent control shall be maintained, along with the means that must be used to preserve knowledge of said facility for the long-term".*

Similarly, authorisation for the dismantling and closure of facilities for disposal of spent nuclear fuel and radioactive waste, introduced in the regulation of the licensing of facilities as a result of Directive 2011/70/Euratom, seeks to guarantee the long-term security of the storage system which shall determine, in each case, the areas of the site that must be subject to control and radiological monitoring or any other form of monitoring for a determined period of time.

Article 5
Existing Facilities

Article 5. Existing Facilities

Each Contracting Party shall take the appropriate steps to review the safety of any spent fuel management facility existing at the time the Convention enters into force for that Contracting Party and to ensure that, if necessary, all reasonably practicable improvements are made to upgrade the safety of such a facility.

Measures adopted for the safety review of existing facilities

This article only refers to existing facilities at the time the Convention entered into force in Spain. At that moment, the only spent fuel management facilities were the pools at the nuclear power plants. From the previous report, new changes relating to security of spent fuel pools are referred to in changes in the Periodic Security Review of a facility and the application of some measures of the post-Fukushima National Action Plan (NAcP).

Nuclear power plants are obliged, as established in CSN regulations, to carry out a Periodic Safety Review (PRS) at least once every ten years, the scope of which must cover the spent fuel pool.

A PRS is a process for carrying out the analysis and additional checks that complement the nuclear safety assessments that take place continuously in a nuclear power plant, providing a global and integrated vision of the different aspects of the security of same.

The scope of the periodic review also includes the evaluation of the programmes for improving the safety of the facility in course or the establishment of new programmes where necessary. One of the important aspects of this review consists of the analysis of the updates to the regulation since the last review to see if any new requirements have arisen which may apply to the facility.

After evaluating the results of the PRS carried out on the facilities, the CSN establishes, if considered appropriate, additional safety requirements for licensees.

Among the objectives of a PRS are the following:

- ✓ Analyse the performance of the facility in the different aspects of nuclear safety in a period of time sufficiently long to identify trends.
- ✓ Check the adequacy of the system used in the analysis of the different aspects of nuclear safety of the facility documented in periodic reports.
- ✓ Identify the possible existence of cumulative effects that might negatively affect the nuclear safety of a facility.
- ✓ Analyse the situation of the facility with respect to the international and domestic regulation in the country of origin of the project.
- ✓ Analyse the status of the facility against technological advances that might have been made during the period covered by the review.

During the period covered by this National Report, the PRS of the Trillo NPP was carried out with the scope indicated above. The following aspects stand out in relation to the safety improvements introduced at the facility:

- ✓ Modifications in relation to the instrumentation of the spent fuel pool.
- ✓ Guides for the mitigation of the consequences of an accident for the reactor, fuel elements pool and containment.
- ✓ Plans to control and extinguish large fires that affect multiple areas, including the ITS.

Similarly, the experience of the management of nuclear fuel, its storage in pools or dry storage in casks in the ITS facility, including the handling, drying and filling with helium and the ALARA aspects of said operations.

The CSN has carried out a detailed assessment of said information and has concluded the acceptability of the security review carried out.

With respect to other existing facilities, after the accident at Fukushima, in accordance with the ENSREG directives in relation to stress tests, the CSN put in place the National Action Plan, requiring Spanish nuclear facilities to implement measures to tackle situations beyond design basis. In the case of fuel pools, the measures required, already implemented at all nuclear power plants, are aimed at improving instrumentation and making the capacity of residual heat assessment more robust. This information has been described in Annex F.

Article 6
Siting of Proposed Facilities

Article 6. Siting of Proposed Facilities

1. *Each Contracting Party shall take the appropriate steps to ensure that procedures are established and implemented for a proposed spent fuel management facility with the following purposes:*
   - i. *to evaluate all relevant site-related factors likely to affect the safety of such a facility during its operating lifetime;*
   - ii. *to evaluate the likely safety impact of such a facility on individuals, society and the environment;*

iii. *to make information on the safety of such a facility available to members of the public;*

iv. *to consult Contracting Parties in the vicinity of such a facility, insofar as they are likely to be affected by that facility, and provide them, upon their request, with general data relating to the facility to enable them to evaluate the likely safety impact of the facility upon their territory.*

2. *In so doing, each Contracting Party shall take the appropriate steps to ensure that such facilities shall not have unacceptable effects on other Contracting Parties by being sited in accordance with the general safety requirements of Article 4.*

The Sixth General Radioactive Waste Plan, currently in force, contains Spain's basic strategy for the management of spent fuel, with temporary storage of spent fuel and high level waste based on a dry system that guarantees security and protection of the persons involved and the environment during the periods of time necessary to proceed with disposal.

The planned facilities for the management of spent fuel will be destined for the storage of said fuel, whether on a centralised or individualised basis. In general, the aspects of siting to be considered shall depend on whether a new site is to be used, as in the case of the CTS or if the sites of the nuclear power plants themselves are to be used, as in the case of the ITS facilities.

6.1. Proposal of new spent fuel management facilities

The solution proposed for the management of spent fuel, high level waste and other radioactive waste that cannot be stored at the El Cabril disposal facility is based on a dry vault-type storage facility called the Centralised Temporary Storage (CTS), with an operating period of around 60 years.

The CTS storage strategy was proposed to the Government unanimously by the Parliamentary Committee on Industry in December 2004, made up of representatives of all parliamentary groups. Thus, the same Parliamentary Committee, in its session of 27 April 2006 approved a Non-Law Proposition pertaining to the establishment of an Inter-ministerial Committee responsible for establishing the criteria that must be met by the site for the CTS for nuclear fuel and high level waste and the associated technology centre.

Said process of selection of the site, which was described in detail in Article 6.1 of the Fourth National Report, led to the Agreement of the Council of Ministers of 30 December 2011, approving the designation of the Municipality of Villar de Cañas (Cuenca) as the site chosen for the Centralised Temporary Storage facility for spent nuclear fuel and high level waste and the Associated Technology Centre.

Once the site was designated on the part of the Government, the licensing process started, which requires different authorisations in accordance with specific nuclear and environmental legislation.

Insofar as it refers to nuclear standards, the Nuclear Facilities and Radioactive Waste Regulation (RINR) considers said CTS to be a nuclear facility which requires, before entering into operation, obtaining the prior authorisation (or siting license), the construction authorisation and the operation authorisation, the granting of which is the responsibility of the Ministry of Energy, Tourism and the Digital Agenda, subject to the mandatory and binding report of the CSN.

The RINR allows for these kinds of facilities to simultaneously request prior authorisation and construction authorisation. For this, ENRESA presented before MINETAD, on 13 January 2014, the requests for prior authorisation and construction authorisation for the CTS facility. The prior authorisation has already received a favourable report from the CSN on 27 July 2015,

pending the granting of the Environmental Impact Declaration and approval by MINETAD, and the construction authorisation is under the assessment of the CSN.

With regard to the environmental regulations, the project is submitted to the environmental impact assessment procedure, requiring the granting of an Environmental Impact Declaration (EID) which is the responsibility of the Ministry of Agriculture and Fisheries, Food and the Environment (MAPAMA).

To such effects, ENRESA presented, in August 2013, the request that the project be submitted to environmental assessment, and accompanied it with the starting document to determine the scope of the corresponding Environmental Impact Assessment (EIA), which was presented in May 2014.

In order to comply with the provisions of both, MINETAD carried out, in May 2014, the public information processes and consultations with the Public Administrations affected and the persons interested, whose details are provided in Article 6.4 of this Report.

For its part, the Regional Government of Castilla La Mancha agreed, on 29 July 2015 to begin the procedure for the extension of the Natura 2000 Network protected space of Laguna del Hito, affecting the lands where the CTS was to be located. This Agreement adopted a preventive protection regime in the area until the Resolution of the procedure, which forced the stoppage of all works and required a favourable report from the Regional Government of Castilla-La Mancha prior to the granting, by any Public Administration, of any authorisation, license or contract to carry out said works. The State Attorney lodged an appeal against this agreement on October 2015, requesting its annulment and, as a precautionary measure, the suspension of its enforceability.

The Regional Government continued with its procedure and published on 4 October 2016 the Decree 57/2016 extending the BirdLife Special Protection Area of the Laguna del Hito, lodging a proposal to the European Commission for its declaration as a Site of Community Importance (SCI). For its part, the State Attorney lodged, on 14 October 2016, an additional written statement to accompany the administrative-contentious appeal in relation to the aforementioned Decree 57/2016.

On 16 December 2016, the Supreme Court granted the appeal lodged by the State Attorney against the Ruling of the High Court of Justice of Castilla-La Mancha which, on 22 December 2015, had denied the precautionary measure of suspension of the aforementioned agreement of the regional government through which they began the extension of the BirdLife Special Protection Area.

After the sentence of the Supreme Court, on 8 March 2017, the Supreme Court of Justice of Castilla La Mancha agreed to suspend the enforceability of Decree 57/2016 and is therefore today awaiting the issue of the Environmental Impact Declaration on the part of the MAPAMAA.

As a consequence of the above, the terms initially established for the entry into operation of the CTS could be delayed in respect of the initially estimated dates.

On the other hand, taking into account the delay already experienced in the terms of licensing and execution of the CTS and the saturation of pools at Spanish nuclear facilities, it has been necessary to begin the licensing of three new dry storage facilities for spent fuel, called Individualised Temporary Storage (ITS) for the Santa María de Garoña, Almaraz and Cofrentes[11] nuclear power plants, to add to the existing ones in operation at the Trillo, José Cabrera and Ascó nuclear plants. Once the CTS is operational, it is expected that all spent fuel currently stored in ITS facilities will be brought there.

[11] *The Cofrentes nuclear power plant recently lodged a request that the ITS project be submitted to the Environmental Impact Assessment procedure and it is envisaged that, over the coming months, the request for the authorisation for the execution and assembly of same will be presented before MINETAD.*

With regard to the ITS at Santa María de Garoña, the two seismic category reinforced concrete slabs are under construction. Their functioning does not require the systems of the nuclear power plant to be able to operate. Their licensing complies with the nuclear and environmental regulation, requiring the following procedures:

- ✓ Licensing of the modification of the design of the facility for the installation of a temporary individualised storage (ITS) in accordance with the procedure established in Article 25 and the following of the RINR. Authorisation for the execution and assembly of the modification, which was conceded prior to the report of the CSN, via the Resolution of the Directorate General of Energy Policy and Mines, of 13 October 2015 and authorisation for the start-up of the modification of the plant, pending a report from the CSN.

- ✓ Licensing of dual purpose spent fuel cask for storage and transport in accordance with Articles 80 and 77 of the RINR. The ENUN 52B cask has been designed to meet the needs of different forms of storage and transport of 52 spent fuel elements, undamaged and ribbed, type BWRGE from the Santa María de Garoña NPP. On the one hand, the use of the spent fuel facilities was approved in accordance with Article 80 of the RINR, through the Resolution of the Director General of Energy Policy and Mines, of 20 November 2014, subject to report from the CSN. On the other hand, through the Resolution of 11 June 2015 and pending the report of the CSN, said cask was approved as a model for bulk transport type B(U)F, in accordance with the requirements in Article 77 of the RINR. Said transport may be inter-modal: land (road, rail) or maritime.

- ✓ With regard to the impact of the facility on the environment, the project was submitted to environmental impacts assessment in accordance with the then applicable Legislative Royal Decree 1/2008, of 11 January, approving the recast texts of the Law on the environmental impact of projects. Said process culminated in the Resolution of the Secretary of State of the Environment, of 30 September 2015, which contained a favourable Environmental Impact Declaration for the project.

For its part, the ITS project at the Almaraz NPP provides for the construction of a seismic category storage slab, where the casks shall be deposited. The cask used for storage of spent fuel will be the multi-purpose ENUN 32P cask. The licensing process is similar to that followed by the Garoña ITS:

- ✓ Through a Resolution of 14 December 2016, of the Directorate General of Energy Policy and Mines, subject to previous report of the CSN, the execution and assembly of the design modification corresponding to the ITS at Almaraz Units I and II was authorised, in accordance with the provisions of Article 25.2 of the RINR, pending the corresponding authorisation for the implementation of the modification.

- ✓ With regard to the ENUN 32P casks, their design was approved for the storage of PWR spent fuel at storage facilities through the Resolution of the Directorate General for Energy Policy and Mines of 22 September 2015 and as package model for transport type B(U)F of 19 October 2016, both pending CSN report.

- ✓ In addition, the Official State Gazette published on 24 November 2016 included the Resolution of 7 November 2016 of the Secretary of State of the Environment, containing a favourable Environmental Impact Declaration for said ITS.

Finally, the Cofrentes NPP plans to construct an ITS in accordance with the two seismic category reinforced concrete slabs. The licensing process shall be similar to those described previously. At present, the licensee has requested that the project undergo the environmental impact

assessment process, as part of the plan that the ITS execution and assembly authorisation request is submitted in the coming months.

Questions relating to the siting, criteria for assessment of the radiological repercussions, public information, construction and security, both of the CTS and of those ITS facilities that may be found in sections on Articles 6.2, 6.3, 6.4, 7 and 8 of this Report.

6.2. Measures for the assessment of all factors related to siting that might impact on security

The analysis of the factors pertaining to the siting of nuclear facilities can be found in the documentation to be presented for the corresponding authorisations, as established in the RINR (see Annex B of this Report), in the terms provided in CSN Instruction IS-26.

Specifically, with the request for preliminary authorisation for the site, the site characterisation study of the area of influence of the facility is presented, which must include sufficient information on the parameters of same that might impact on nuclear safety or radiological protection, including demographic and ecological parameters, and activities related to spatial planning. This documentation is assessed by the CSN, which issues a report for the granting of the authorisation on the part of the Ministry.

This information is considered in the documentation to be presented with the request for authorisation for construction and, subsequently, with the application for operation, which, in addition to the updated information on the parameters of the site, including those pertaining the use of soils and water and data that might contribute to better knowledge of same, must include the monitoring and verification plans for the basic representative parameters.

In addition, the siting factors are assessed in the Periodic Safety Reviews to which nuclear facilities are subject, which are carried out every 10 years, and the requests for modification of the plants where such modifications impact upon any factor pertaining to use of the soil or conditions originally forecast at the site. Finally, with the dismantling and decommissioning request, a radiological study of the site and its area of influence must be presented.

In the case of the ITS facilities, both the existing facilities at the Trillo, José Cabrera and Ascó nuclear power plants and the planned facilities at the Santa María de Garoña, Almaraz and Cofrentes nuclear power plants, the safety assessment must take into account the characteristics of the site in each case, established through successive authorisations of said plants and the interfaces of same with the corresponding storage system, so that:

- ✓ It is verified that the factors of the site are within the margins contained in the Safety Study for the approval of the storage casks to be used, in accordance with the requirements of Instruction IS-20 on design and use requirements of the casks.
- ✓ An analysis of the site factors that may impact upon the design and settlement of the ITS concrete slab is also carried out.

In the case of the planned CTS facility, licensing follows the process established in the legal framework applicable to nuclear facilities, which includes the request for preliminary or site authorisation, construction and operation authorisation.

The CSN has assessed the request for preliminary authorisation and in July 2015 issued the mandatory and binding report in terms of the requirements imposed in the area of nuclear safety and radiological protection to MINETAD. Said report includes the conclusion of the assessment which analysed the factors relating to the site that might affect the security of said facility during the life cycle of same. In the process of characterisation performed at the site of the planned CTS

for detailed knowledge of the characteristics of the soils, the following disciplines were analysed systematically:

- ✓ Geography, demography and studies of nearby facilities
- ✓ Geology and geomorphology
- ✓ Seismology
- ✓ Meteorology
- ✓ Surface-water hydrology
- ✓ Hydrogeology and hydrogeochemistry
- ✓ Geotechnics and soil stability

The characteristics of the proposed site condition the design of the CTS and, therefore, the design characteristics that must be met by the buildings at the facility and construction, along with the soil monitoring requirements have all been assessed.

As substantial elements associated with the preliminary or site authorisation, the need for the facility in the General Radioactive Waste Plan has been considered, to comply with same. Other aspects of physical protection have also been analysed, such as quality assurance and transport of waste to CTS storage facility.

The CSN has also studied the allegations made in the public information process within the procedure for authorisation and there is no aspect conditioned or modified by the technical evaluation that the CSN has carried out in the framework for the licensing process. Nor has the need been identified for formal modification of the contents of the official documents associated with preliminary authorisation.

In addition, like improvements in safety, consideration of resistance to different extreme natural events was also requested in the design, in accordance with Directive 2014/87/Euratom (see Annex F).

6.3. Criteria to assess radiological repercussions on the environment and neighbouring population

In accordance with Instruction IS-29, Article 3.1, the licensee of the CTS must have the general safety objective of protecting people and the environment from the prejudicial effects of ionising radiation. For that, he must demonstrate in the Safety Study of the facility that it complies with this objective both in normal operation, in planned operational events and in the case of accidents.

During normal operation and planned operational events, the effective annual dose for any member of the public located beyond the controlled area must be lower than 250 μSv. Controlled area is understood as the area surrounding the storage facility where the licensee of same exercises authority over the use and within which operations are carried out with a distance of at least 100 metres between spent fuel or high level radioactive waste stored at the facility and the limit of the controlled area. For the purpose of ensuring that exposure to the population is maintained at the lowest value reasonably possible, operational restriction on the doses arising from radioactive effluents and levels of off-site irradiation produced at the facility may be established. The CSN has required the application of dose restriction from effluents of 0.1 mSv/a, in line with other nuclear facilities.

For design basis accidents the acceptance criteria are set in terms of the effective dose lower than: 50 mSv, lower skin equivalent dose at 500 mSv and crystalline equivalent dose lower than 150 mSv and the same for any member of the public located beyond the controlled area. The verifi-

cation of said limits for postulated initiative events is covered in the analysis of accidents and their radiological consequences included in the Safety Study of the facility. The acceptable threshold for estimated frequency of an event is one in one million years for a detailed analysis of the effects of events of this kind and potential measures to mitigate them. In any case, the cut-off threshold value for the consideration of success as a basis of design must be established in the design basis. Therefore, on-site or off-site events with a lower excess frequency may be considered to be beyond the basis of design.

In the case of individualised temporary storage (ITS) facilities existing on-site at the Trillo and Ascó nuclear power plants, at the José Cabrera nuclear power plant in the dismantling phases and those planned for Santa María de Garoña and Almaraz, the evaluation must take into account the characteristics of the site itself, established through the licensing and review of the plant itself and the interface with the storage system. At these facilities, during normal operation and planned operational events, compliance with the aforementioned radiological acceptance criteria takes into account off-site and on-site irradiation due to the contribution of existing nuclear power plants at the site.

With regard to the CTS, the assessment of radiological impact on the public (direct radiation and effluents) in normal operation has been carried as a preliminary step towards the Environmental Impact Declaration. In addition, pre-operational radiological monitoring programme has begun.

6.4. Information for the public on the safety of planned spent fuel management facilities

The general questions pertaining to public information (role of the regulatory body and other authorities, duty to inform citizens, local committees for information on nuclear power plants, publicity of standards projects, Law 21/2013, etc.) have already been covered in Article 20.2.8 and Section 3 of Annex B of this Report, and therefore we only highlight below those specifically linked to public information in relation to safety of spent fuel management facilities planned for this period, that is, the CTS and ITS facilities at Santa María de Garoña, Almaraz and Cofrentes.

In accordance with the provisions of the nuclear and environmental legislation, MINETAD completed the preliminary authorisation and Environmental Impact Assessment processes for the CTS, consulting the entities and bodies affected and the public through the publication in the Official State Gazette[12] and in the corresponding Autonomous Community[13] of an extract announcement with the purpose and principal characteristics of the facility, making the project available to anyone who want to consult it and allowing a term of thirty days for the written submission of the objections they consider appropriate.

The preliminary authorisation received 2,158 objections and the Environmental Impact Assessment 2,026, which were analysed and responded to on the part of ENRESA, incorporating into the project those they considered appropriate. For its part, the CSN also studied the objections and did not identify any aspect that warranted modifications to the technical assessment made within the framework of the licensing process or the content of the official documents associated with the preliminary authorisation.

The ITS projects at Santa María de Garoña[14] and Almaraz[15] were also submitted to public information processes and affected entities and bodies were consulted, as will be the case when the Environmental Impact Assessment is presented for Cofrentes.

[12] *https://www.boe.es/boe/dias/2014/06/13/pdfs/BOE-B-2014-21239.pdf*

[13] *http://docm.castillalamancha.es/portaldocm/descargarArchivo.do?ruta=2014/06/13/pdf/2014_7702.pdf&tipo=rutaDocm*

Article 7
Design and Construction of Facilities

Article 7. Design and Construction of Facilities

Each Contracting Party shall take the appropriate steps to ensure that:

i) the design and construction of a spent fuel management facility provide for suitable measures to limit possible radiological impacts on individuals, society and the environment, including those from discharges or uncontrolled releases;

ii) at the design stage, conceptual plans and, as necessary, technical provisions for the decommissioning of a spent fuel management facility are taken into account;

iii) the technologies incorporated in the design and construction of a spent fuel management facility are supported by experience, testing or analysis.

7.1. Design and construction measures to limit the radiological impact of facilities

The purpose of radiological protection of spent fuel management facilities is established on a general basis in Article 38 of Law 25/1964, the Nuclear Energy Act. Specifically, this objective is developed in the CSN Safety Instructions IS-26 on requirements of the management system of nuclear installations and IS-29 on safety criteria at spent fuel and high-level radioactive waste storage facilities.

The latter Instruction, IS-29, requires that the objective of radiological protection be taken into account in the design, construction and operation of the facilities, which requires the adoption of measures to:

- ✓ limit, minimise and control the exposure to radiation of persons and the release of radioactive materials into the environment.
- ✓ limit the probability of events that might result in the loss of control of any source of radiation.
- ✓ mitigate the consequences of said events where they occur and
- ✓ minimise the radioactive waste generated.

In accordance with the RINR, the Safety Study to be presented with the request for authorisation of this type of facility must demonstrate that it complies with these objectives, both in normal operation, abnormal conditions and in the event of an accident.

For the ITS facilities located on-site at nuclear power plants the request for authorisation, formulated as an authorisation of the modification of the design of the plant in accordance with Articles 25 and 26 of the RINR, is accompanied by the corresponding safety analysis. The Safety Studies are assessed by the CSN prior to the granting of the corresponding authorisation by the Ministry of Energy, Tourism and the Digital Agenda (MINETAD).

In a complementary manner, in accordance with the requirements of Article 80 of the RINR, the design of the storage casks or systems used at the ITS facilities must be approved by MINETAD

[14] *https://www.boe.es/boe/dias/2014/02/28/pdfs/BOE-B-2014-7269.pdf*

[15] *https://www.boe.es/boe/dias/2015/10/24/pdfs/BOE-B-2015-31825.pdf*

after the evaluation of the corresponding Safety Study in accordance with the provisions of CSN Instruction IS-20 establishing the safety requirements relating to spent fuel storage casks.

In practice, as commented in the previous National Report, the process for approval of the design of the casks and authorisation of the existing ITS facilities at the Trillo, José Cabrera and Ascó nuclear power plants took these objectives and requirements into account. Since the Fifth Report, two ITS facilities have been authorised and are in different phases of construction at the Santa María de Garoña and Almaraz nuclear power plants, whose licenses followed the same procedure as previous ITS facilities. Both will be interim facilities and will house dual-purpose storage and transportation dry storage casks. The casks, designed and built by the Spanish company ENSA are the EN-UN 52 B model at Garoña and the ENUN 32 P model.

As indicated in previous Reports, in the case of the CTS, consideration will be given, in addition to the criteria and requirements established in the applicable legislation, to the design conditions contained in favourable report on the generic design issued by the CSN in July 2006 in the reference standard specified in said appreciation, and to the implementation of improvements in design of the facility to tackle the "serious conditions" (beyond the basis of design) arising from the application of Directive 2014/87/Euratom (see Annex F).

7.2 Provisions for decommissioning

As can be seen in Annex B referring to licensing process for facilities, the RINR requires, in Article 17, that among the documentation to be presented with the request for construction of nuclear facilities, the technological, economic and financial provisions for dismantling and decommissioning be included. In addition, these provisions be primarily developed in the request for authorisation to operate, in accordance with the provisions specified in Article 20 of the RINR.

To such effect, as part of the request for the construction of the CTS, the report describes the technological, economic and financial provisions for the future dismantling and decommissioning.

With regard to the ITS facilities at the Trillo, José Cabrera and Ascó nuclear power plants, in operation, and the ITS facilities planned for Santa María de Garoña, Almaraz and Cofrentes, currently in different phases of licensing and construction, their authorisation processes followed or will follow the provisions of Articles 25, 26 and 27 insofar as they pertain to the modification of design of the facilities of corresponding nuclear power plants.

In accordance with the provisions of the RINR, the modifications to the design of nuclear facilities must include considerations for the decommissioning of the modification which must be taken in to account insofar as they must be compatible with the decommissioning of the principal facility.

7.3. Technologies used for the storage of spent fuel

As indicated in previous editions of this Report, the technology that contributes greater to storage capacity for spent fuel in Spain is the pool method. All operating nuclear power plants have these facilities.

Moreover, at Trillo, José Cabrera (in dismantling phase) and Ascó, there are dry fuel storage systems. In the first case, the technology consists of dual-purpose (storage and transport) metallic casks stored in a purpose built building. The casks used at the José Cabrera nuclear power plant and the Ascó nuclear plant are based on the use of welded metallic canisters which are deposited in a metal-concrete module for storage. The casks are temporarily stored at the plant itself in an interim storage facility.

As was also pointed out in previous reports, the strategy for long-term temporary management of spent fuel is storage at a single purpose-built CTS facility where all of it is centralised along with high or intermediate level and long-life waste that cannot be placed in disposal at the El Cabril disposal facility. The CTS facility is a dry storage facility based on welded canisters that contain fuel, which are placed in concrete vaults. The evacuation of heat from the fuel is done using natural air convection. Its capacity is 6,700 tU in fuel elements plus the high level vitrified waste containers originating from reprocessing at Vandellós I and other intermediate level and long life waste (special waste) that is not suitable for disposal at El Cabril. It is planned that the CTS facility will have the following elements:

- ✓ Area or building for receiving spent fuel
- ✓ Processing building for condition of fuel in storage canisters
- ✓ Auxiliary system and services building
- ✓ Storage modules for spent fuel canisters , each with two vaults with independent air intakes and outlets
- ✓ Special waste storage module (intermediate level and long life waste)
- ✓ Cask maintenance workshop
- ✓ Spent fuel and radioactive waste laboratory

The vault technology selected for the CTS has international experience, in design for spent fuel only and as a solution for glass with waste or high level waste or as a combined solution. In all cases, the security requirements have been adequately met.

The delay in the construction of the CTS led to the need for additional dry storage capacity at the Santa María de Garoña, Almaraz and Cofrentes nuclear power plants. The technology to be applied at the Garoña nuclear power plant is the ENSA EN UN 52 B model dual-purpose (storage and transport) metallic casks. In the case of the Almaraz nuclear power plant the technology which shall be used is also dual-purpose metallic casks, ENUN 32 P model. Both the cask to be used at the Santa María de Garoña nuclear power plant and that to be used at the Almaraz nuclear power plant, the ENUN 32 P, have been licensed by the nuclear safety authority, the CSN.

Article 8
Assessment of Safety of Facilities

Article 8. Assessment of Safety of Facilities

Each Contracting Party shall take the appropriate steps to ensure that:

i) before construction of a spent fuel management facility, a systematic safety assessment and an environmental assessment appropriate to the hazard presented by the facility and covering its operating lifetime shall be carried out;

ii) before the operation of a spent fuel management facility, updated and detailed versions of the safety assessment and of the environmental assessment shall be prepared when deemed necessary to complement the assessments referred to in paragraph i.

8.1. Legal and regulatory requirements

The measures for carrying out the safety analysis before the construction and operation of spent fuel management and storage facilities are established by the RINR, which requires the presen-

tation by the licensee of a Preliminary Safety Study (PSS) with the request for construction and a Safety Study (SS) with the request for operation of the nuclear facilities.

The content of each of these safety studies, the PSS and the SS can be found in detail in the RINR, in accordance with the provisions of Annex B of this Report. Said studies must include, in addition to the description of the site and the description of the facility, the analysis of foreseeable accidents and their consequences along with an analytical radiological study which estimates the potential radiological impact on the population and the environment.

This requirement can be found in CSN Instruction IS-26 on basic safety requirements applicable to nuclear facilities, and in greater detail in Instruction IS-29 on spent fuel storage facilities, which emphasise the principles of defence in depth, multiple-barrier protection and passive security, specifying that the objective of the safety analysis to be carried out by the licensee is to verify the capacity of the barriers and important elements for safety to prevent accidents and mitigate the consequences.

Application of licensing to existing and planned facilities

The licensing of pools linked with nuclear power plants is integrated within the licensing of the plants themselves and falls within the process of the Periodic Safety Review of the nuclear power plant. The operations for replacing the original racks or re-racking, carried out at the pools of all nuclear power plant, have been carried out since the 1990s as modifications to the design of the plants, in accordance with Article 25 of the RINR. The request for these modifications was accompanied by the corresponding safety study with the analysis and the proposed modification associated with said operation, as detailed in the previous National Reports.

The existing individualised temporary storage (ITS) facilities at the Trillo, José Cabrera and Ascó have been licensed as modifications of the design of the facilities in which they are located, under Article 25 of the RINR. The same process is being followed for the licensing of the planned ITS facilities at the Santa María de Garoña, Almaraz and, pending presentation of the request, Cofrentes nuclear power plants.

In addition, the spent fuel storage casks require design authorisation in accordance with Article 80 of the RINR, prior to use at a storage facility.

When the cask itself or one of the components of the storage system fulfil transport functions (such as in the case of the dual purpose cask used at the Trillo, Santa María de Garoña, Almaraz and Cofrentes nuclear power plants and the casks for transporting the MPC canister of the storage system of the José Cabrera and Ascó nuclear power plants), the design shall be approved as a package model for B(U) type transport in accordance with the transport regulations, subject to presentation of the corresponding safety study.

In the case of the CTS, licensing is adapted to the regime of authorisations established in the RINR for nuclear facilities, described in Annex B of this Report. ENRESA presented in January 2014 the requests for preliminary authorisation or for siting and authorisation for construction of said nuclear facility. After the pertinent technical assessment, at the meeting on 27 July 2015, the Plenary of the CSN studied the request for preliminary authorisation or siting, along with the technical opinion proposal, agreeing to report favourably with certain limits and conditions.

In parallel, the CSN continued the assessment process associated with authorisation for construction centred on the safety analyses of the facility. All of these safety analyses are summarised in the Preliminary Safety Study. This study has undergone modifications as the detailed design has advanced, resulting in changes to the requirements of the CSN during this assessment process.

In the context of this request, the Plenary of the CSN has, to date, issued up three Technical Instructions (mandatory):

- ✓ Technical Instruction (April 2015) on the training of personnel employed at the Centralised Temporary Storage facility. The aim of this Technical Instruction is to define the activities of the CTS which must be carried out by personnel and ensure in advance the appropriate provisioning and training of the personnel.
- ✓ Technical Instruction (February 2016) on the application of Council Directive 2014/87/Euratom to the Centralised Temporary Storage facility.
- ✓ Complementary Technical Instruction (December 2016) for ENRESA, as licensee of the authorisation for physical protection associated with the construction phase of the facility, in order to comply with the provisions for Royal Decree 1308/2011, of 26 September, on physical protection of nuclear facilities, nuclear materials and radioactive sources. ENRESA must study the scenarios provided for in the design-basis threat and identify the measures to implement during the design and construction phases.

In all cases, the safety studies are assessed by the CSN prior to the granting of authorisations by the Ministry of Energy, Tourism and the Digital Agenda, in accordance with the functions attributed to the CSN by its creating law and the provisions of the RINR.

Article 9
Operation of Facilities

Article 9. Operation of Facilities

Each Contracting Party shall take the appropriate steps to ensure that:

i) the licence to operate a spent fuel management facility is based upon appropriate assessments as specified in Article 8 and is conditional on the completion of a commissioning programme demonstrating that the facility, as constructed, is consistent with design and safety requirements;

ii) operational limits and conditions derived from tests, operational experience and the assessments, as specified in Article 8, are defined and revised as necessary;

iii) operation, maintenance, monitoring, inspection and testing of a spent fuel management facility are conducted in accordance with established procedures;

iv) engineering and technical support in all safety-related fields are available throughout the operating lifetime of a spent fuel management facility;

v) incidents significant to safety are reported in a timely manner by the holder of the licence to the regulatory body;

vi) programmes to collect and analyse relevant operating experience are established and that the results are acted upon, where appropriate;

vii) decommissioning plans for a spent fuel management facility are prepared and updated, as necessary, using information obtained during the operating lifetime of that facility, and are reviewed by the regulatory body.

9.1. Authorisation to operate: limits and conditions. Operational experience

The spent fuel storage pools at all plants currently in operation have been assessed and authorised within the licensing process of the plants themselves. Therefore, the design requirements for design and limits and conditions for operation contained in the safety assessments form part of the operation authorisations granted to licensees, once the programme for start-up (pre-nuclear and nuclear testing programme) is finalised, demonstrating the facility, thus built, meets the design and safety requirements.

In addition to the pools, and as indicated throughout the previous articles, there exist three individualised temporary storage facilities with dry storage casks for spent fuel and three more in different phases of construction. In all cases, the licenses are based on a series of safety assessments. For those in operation, a programme of pre-operational tests were carried out before the granting of the operating license.

On the other hand, within the procedures for nuclear power plants, the analyses of own and other operational experiences are taken into account, which can result in actions to improve both aspects of design and operational procedures. Some of the reports analysed are generated by INPO/WANO, US-NRC and suppliers.

Spent fuel operations at the nuclear power plants are conducted in accordance with the Operating Technical Specifications (OTSs) and the Radioactive Waste Management Plan (RWMP), both mandatory.

The OTSs establish the operating technical conditions, the applicability, the necessary actions and the monitoring requirements necessary to comply with the limit conditions. They also contain the limit values of variables that affect safety, operational limits of automatic protection systems, the minimum operating conditions, the review programme, calibrating and inspections and periodic testing of different systems and components and operational control.

To develop and detail the monitoring requirements of the OTSs, monitoring procedures are prepared by the different departments involved in the operation of the power plant.

The RWMP of a facility has the aim of collecting the criteria and methods that ensure that the management of the radioactive waste and spent nuclear fuel generated at facilities is safe and optimised, considering the advances in regulation and technology, taking into account:

- ✓ The origin of radioactive waste and the history of spent fuel,
- ✓ The existing situation at the facility, in terms of management and, where applicable, transfer of radioactive waste and spent fuel at other subsequent phases,
- ✓ The interdependencies between the different phases in the management of radioactive waste and spent fuel,
- ✓ The study of alternatives to the systems and management of possible improvements in same,
- ✓ Justification of the suitability of management and need to implement improvements,
- ✓ Planning of the implementation of improvements identified. The RWMP is the reference document for the management of waste and spent fuel generated at the different nuclear facilities, both during operation and in the dismantling and decommissioning phase.

In particular, the licensee of the facility must maintain the inventory of waste and spent fuel up to date, minimising the generation thereof and recycling and recovering waste generated to the extent this is technically and economically possible and condition final waste for delivery to the

authorised final manager, final waste referring to waste not subjected to further treatment under the prevailing technical or economic conditions nor recovery of recoverable parts.

The RWMP for each facility must consider jointly the risks, both radiological and other kinds, associated with radioactive waste and spent fuel to define global services and the functioning of the treatment systems for liquid and gaseous radioactive waste.

9.2. Procedures for the operation, maintenance, radiological monitoring, inspection and testing

At nuclear power plants there are procedures that regulate the performance of different activities related to the operation, maintenance, radiological monitoring and inspection of structures, systems and equipment used in spent fuel storage.

The facilities keep detailed inventories of spent fuel elements stored in the pool with the following information on each element stored:

- ✓ Identification and technical characteristics (manufacturer, model and type),
- ✓ Burnup history and burnup value reached,
- ✓ Isotopic balance of the assembly,
- ✓ Storage position,
- ✓ Physical condition of the assembly, existence of fuel rod failures and inspections performed,
- ✓ Defective fuel rods extracted from the assemblies.

This information is updated at the end of each operating cycle pursuant to the requirements of the corresponding OTS and the Annual Report of the RWMP.

The monthly operating reports submitted to the CSN provide information on the storage status of the pools and spent fuel storage casks and any possible variations with respect to the previous report, including a list of the existing fuel assemblies, the accumulated burnup and the date of unloading from the reactor.

Spent fuel storage systems are also subject to monitoring in order to ensure that:

- ✓ Spent fuel stored temporarily, in dry or wet conditions, is maintained in subcritical conditions at all times in accordance with the OTSs;
- ✓ These storage systems have an adequate rate of residual heat extraction to ensure that the exposure to radiation and radioactive substances during spent fuel handling operations and during the temporary storage phase (in pools or casks) is maintained as low as reasonably possible (ALARA) and always below the regulatory limits (MPR);
- ✓ Radiation monitoring systems fulfil their function on the basis of design.

The ITS facilities for dry storage of spent fuel elements from spent fuel pools are designed to house fuel elements once they have undergone the heat removal and cooling period in the pools. For correct operation, different operational, monitoring, maintenance and testing procedures have been developed at the affected plants. These include the procedure for loading and handling casks, the sealing of their contents, transfer and unloading and those pertaining to abnormal occurrences, faults and/or malfunctions of handling equipment or systems and the storage system.

9.3. Engineering services and technical support

Nuclear power plants are provided with engineering services and technical support to facilitate compliance with and verification of safety criteria in the area of spent fuel storage, within the scope described in the operational regulations.

The contracts established with suppliers and/or manufacturers of nuclear fuel provide for technical support in relation to the fuel elements supplied, including the transfer of the characteristics and design of the elements, their operational limits for the guarantee of the fuel and the plans and data that the nuclear power plant requires as a result of the contracts established between the nuclear power plant and the competent companies in irradiated fuel services (ENRESA, transport of irradiated fuel, storage, etc.).

9.4. Notification of incidents

The OTSs of the nuclear power plants establish the conditions requiring special reports where significant incidents affecting the safety of spent fuel storage facilities might occur.

Reportable events are reported to the CSN and the competent government authorities using the formats of CSN Instruction IS-10, Review 1 of 30 July 2014. The Special Reports are sent to the CSN, as established by the OTSs.

On the other hand, the CSN is also tasked with inspection and control of the operation of nuclear power plants, with the powers to carry out inspections in the area of nuclear safety and radiological protection.

9.5. Programmes for gathering operational experience

Since 2008 and after several incidents/events at Spanish nuclear power plants in the years 2007 and 2008, the licensees adopted the commitment to carrying out a comprehensive analysis of the situation at each plant in order to identify possible improvements and strengthen the allocation of resources in the necessary areas, including analysis of the operational experience.

Additionally, as indicated in Section 9.1 on the licence to operate a spent nuclear fuel management facility, the nuclear power plants carry out procedural analyses of the operational experience of on-site and off-site operational experience, which in some cases lead to improvement actions being taken that may affect the design or operational procedures. The documentation under analysis includes, but is not limited to:

- ✓ Experienced communicated by the competent bodies in the area:
  - a) For nuclear stations of design originating in the US, the event reports (INPO Event Report (IER) issued by the INPO, (Institute for Nuclear Power Operations) or equivalent reports issued by the WANO, (World Association of Nuclear Operators).
  - b) For nuclear power plants of German design, notifications of operating experience (Weiterleitungsnachricht) issued by the Nuclear Safety Society (GRS).
- ✓ Recommendations written by the suppliers, including technical bulletins from suppliers (SAL, SR, RICS-IL, Technical Bulletin, etc.), as well as communications of deficiencies in safety equipment: all notifications pertaining to 10 CFR 21 of the US NRC for nuclear power plants of American design, along with the service and experience reports of the KWU for nuclear power plants of German design.

Finally, the licensees of nuclear power plants conduct continuous nuclear safety assessment of the facility, issuing periodic reports that must be issued to the CSN in accordance with the conditions of the license or authorisation to operate. These periodic reports refer to various disciplines and include own and other operational experiences, which the CSN supervise periodically through bi-annual inspection and control of actions.

9.6. Decommissioning

As established in the RINR, the licensees must draw up, and update, where necessary, the decommissioning plans for a spent fuel management or nuclear facility insofar as it pertains to nuclear waste management, using the information acquired throughout their operational lifetime. These plans are examined by the regulatory authority.

Article 10
Disposal of spent fuel

Article 10. Disposal of spent fuel

If, pursuant to its own legislative and regulatory framework, a Contracting Party has designated spent fuel for disposal, the disposal of such spent fuel shall be in accordance with the obligations of Chapter 3 relating to the disposal of radioactive waste.

There exists a broad consensus in the international ambit on the option of disposal of spent fuel and high level waste in deep geological formations. In Spain, work has been carried out since the year 1985 to study the different options for deep disposal along four basic lines of action:

- ✓ The Site Selection Plan (SSP), which was developed up to 1996. Through this Plan, sufficient information has been gathered to be able to conclude that in the subsoil of the Spanish geography, there are abundant granite, clay and, to a lesser degree, saline formations suitable to housing a disposal facility. Moreover, the existence of a wide geographic distribution of locations was verified which, in principle, may be valid. Specifically, between 1986 and 1996 an analysis was carried out of geological formations suitable to housing the Deep Geological Disposal (DGD) facility. As a result of these works, an Inventory of Suitable Formations was developed.
- ✓ Conceptual designs for a disposal facility in each of the lithologies indicated, seeking the largest number of common points among them.
- ✓ Development of safety assessment exercises of the conceptual designs, integrating the knowledge obtained from the works of the successive ENRESA R&D plans prepared, and demonstrating that the geological repositories allow for compliance with safety and quality criteria applicable to these kinds of facilities. Similarly, there was also generic design and assessment related to the safety of both basic and conceptual design for the aforementioned facility in a granite and clay type host environments. These advances constitute a solid base for the launch of the next phases for the selection of the site for the implementation of the DGD.

Based on these results, and as part of the authorities' information process, the following reports were prepared, as requested in the Sixth GRWP:

- ✓ Options for irradiated fuel management and high level waste management.
- ✓ New technology viability: separation and transmutation.

- ✓ Basic generic projects:
  - ➪ Disposal in granite formations.
  - ➪ Disposal in clay formations.
- ✓ Experiences in decision-making on spent fuel and high level waste management in OECD countries.

The R&D ENRESA Plans have evolved, adapting to Spain's SF/HLW management programme. These plans have allowed for technical knowledge to be acquired and for national working teams to be trained in the development of the disposal option, participating in international research projects and in demonstration projects at underground laboratories abroad.

In parallel, over recent years, a significant effort has been made to track the development of partitioning and transmutation technologies in their different versions. The greater part of the works carried out are of a preliminary nature, concerned with obtaining basic data and analysis of viability, with predominantly theoretical content, while it is envisaged in the forthcoming Euratom framework programmes to initiate projects geared towards studying their industrial viability.

Currently and with a view to the drafting of the Seventh GRWP, work is being done on a provisional plan for the development of DGD, with a series of milestones beginning with the updating of knowledge and technologies and which would lead to the construction of the facility in the decade of the 2050s and operation in the decade of the 2060s, with the following phases:

- ✓ Phase 1 (2016-2020): updating of knowledge.
- ✓ Phase 2 (2020-2023): assessment of information and orientation of future phases.
- ✓ Phase 3 (2023-2027) site selection process.
- ✓ Phase 4 (2028-2035): analysis of candidate sites.
- ✓ Phase 5 (2036-2050): characterisation of site and verification of suitability.
- ✓ Phase 6 (2051-2063): licensing and construction.
- ✓ Phase 7 (2063-2068): initial operation.
- ✓ Phase 8 (2069-): normal operation.

Section H

Safety of radioactive waste management

Section H. Safety of radioactive waste management

Article 11
General Safety Requirements

Article 11. General Safety Requirements

Each Contracting Party shall take the appropriate steps to ensure that at all stages of radioactive waste management individuals, society and the environment are adequately protected against radiological and other hazards. In so doing, each Contracting Party shall take the appropriate steps to:

i) ensure that criticality and removal of residual heat generated during radioactive waste management are adequately addressed;

ii) ensure that the generation of radioactive waste is kept to the minimum practicable;

iii) take into account interdependencies among the different steps in radioactive waste management;

iv) provide for effective protection of individuals, society and the environment, by applying at the national level suitable protective methods as approved by the regulatory body, in the framework of its national legislation which has due regard to internationally endorsed criteria and standards;

v) take into account the biological, chemical and other hazards that may be associated with radioactive waste management;

vi) strive to avoid actions that impose reasonably predictable impacts on future generations greater than those permitted for the current generation;

vii) aim to avoid imposing undue burdens on future generations.

11.1 Measures to guarantee maintenance of subcritical conditions and heat removal

The regulation that governs the management of waste in Spain includes a number of examples of measures to ensure the maintenance of subcritical conditions and heat removal. Instruction IS-26, on the basic requirements of nuclear safety applicable to nuclear facilities, establishes that the licensee of the nuclear facility must analyse whether a series of fundamental safety functions apply: control of reactivity, residual heat extraction and confinement or shielding of radioactive material. More specifically, for temporary storage facilities for spent fuel and high level radioactive waste, Instruction IS-29 also lists the safety functions that must be incorporated by those facilities during their life cycle, both in normal operation and under abnormal or accident condi-

tions. These are the following: control of subcriticality, confinement, residual heat extraction, protection against radiation through the use of materials and appropriate shielding thickness and recover capacity.

As previously indicated, the CTS (Centralised Temporary Storage) facility planned in the current GRWP, whose generic design was favourably received by the CSN in June 2006 will store, in addition to spent fuel from Spanish nuclear power plants, the high level and special waste arising from the reprocessing of spent fuel in other countries and other low and intermediate level waste that, due to its radiological properties, is not suitable for disposal at the El Cabril disposal facility.

In the design of the CTS facility, due attention has been paid to the maintenance of subcritical conditions during the management of radioactive waste arising from reprocessing, as described in Article 4.1 of Section G. By its nature, all other high level and special waste planned to be stored at the CTS is not susceptible to reaching critical conditions. In terms of measures to ensure heat removal, the situation is similar to that described previously. Of the waste mentioned, only vitrified high level waste, currently in France, generates heat in considerable quantities, which has been taken into account for the Safety Study of the generic design of the CTS facility, which is under detailed study as part of the licensing process.

At the disposal facility for low and intermediate level waste at El Cabril, there is also provision for limits to the content of fissile materials, as part of the acceptance criteria governing waste packages for disposal.

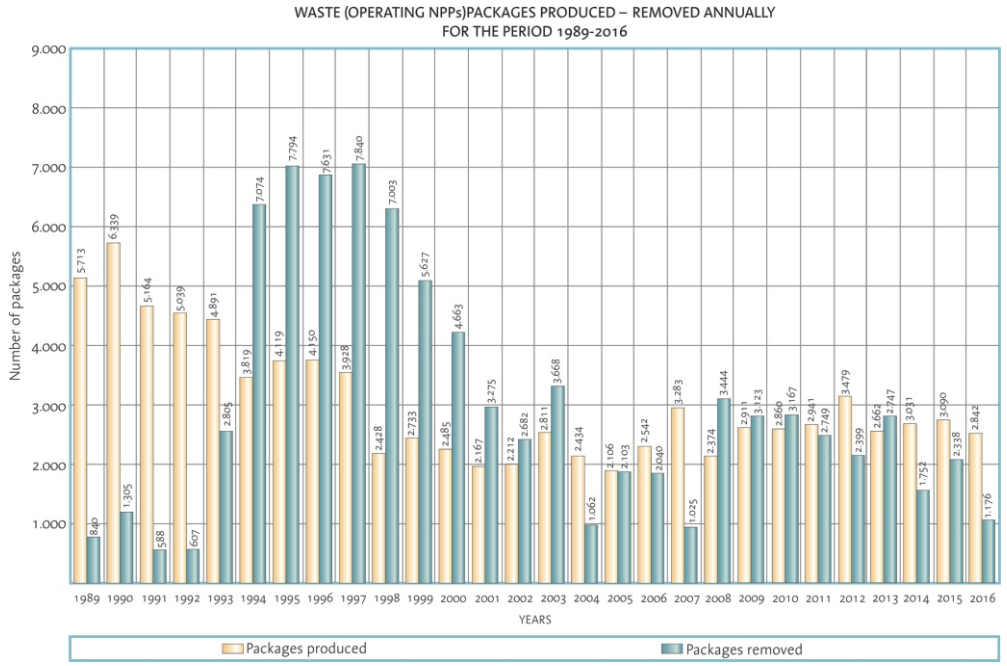
11.2. Measures adopted to ensure that the generation of radioactive waste is kept to the minimum practicable

The principle of minimising the generation of waste is established in Spanish legislation, in Article 38 of the Nuclear Energy Act, requiring producers to adopt the appropriate measures in such a manner so that the generation of waste both in term of its quantity and activity, is kept to the minimum practicable, in accordance with existing scientific practice at all times. Minimising waste is also, in accordance with Directive 2011/70/Euratom, establishing a Community framework for the responsible and safe management of spent fuel and radioactive waste, one of the principles that must govern management and, therefore, this general principle is included in Royal Decree 102/2014, transposing the Directive (Article 3).

The CSN has also fostered the practice of this principle, requiring from ENRESA the optimum use of disposal capacity at El Cabril. Among other measures, ENRESA has worked with nuclear power plants to determine and put in place projects to reduce the volume of these facilities. It has been possible to reduce the annual generation from 1.430 m^3 registered in the year 1990 to approximately 800 m^3 generated at present between all of the nuclear power plants in operation. These figures are very close to the minimum levels technically possible which is why significant further reductions in the future are not expected.

Another achievement of all radioactive facilities is that combined efforts have been made between ENRESA and licensees to reduce the quantities of radioactive waste generated. During the period 1992 to 2003, the annual volume of waste removed was reduced by half, from some 140 m^3 to approximately 70 m^3. From mid-2003 and due to the publication of Order ECO / 1449 of the Ministry of the Economy[16], there was a significant reduction in the generation of waste in this category by producers. The current values for waste generated are in the order of 15 m^3 annually.

[16] *Ministerial Order ECO/1449/2003 (Official State Gazette (BOE) No. 134 of 05/06/2003) establishes the unconditional exemption values for Category 2 and 3 radioactive facilities*



Similarly, the licensees of nuclear facilities have put clearance projects in place that develop Instruction IS-31 of 26 July 2011 of the Nuclear Safety Council on criteria for the radiological control of nuclear materials generated at nuclear facilities.

In the case of operating nuclear power plants, the Spanish Electrical Industry Association (UNESA) and the CSN have developed a methodology that is applied to the clearance of four categories of material: scrap metal, resin, active carbon and wood. ENRESA applies the same methodology in its current dismantling projects, PIMIC and José Cabrera NPP, with the quantities of declassified materials generated as of 31/12(2016 at 837 tonnes for the José Cabrera project and 5,653 tonnes for the PIMIC project.

11.3. Measures adopted to take into account interdependencies among the different steps in radioactive waste management

In Article 4.7 of this report, reference is made to the consideration of the interdependencies between the different phases of management of radioactive waste and spent fuel as a major element in the Spanish legal and regulatory framework, and reference is also made to consideration of this principle in Spanish legislation.

Consideration of interdependencies conditions the licensing process for nuclear facilities. For nuclear power plants, the licensee is required to prepare and apply the Process Control Programme (PCP) in the operation of systems for treating and conditioning waste for the generation of packages compatible with existing forms of management for disposal.

With regard to second and third-category radioactive facilities for medical, industrial or research purposes Ministerial Order ECO/1449/2003 (BOE No. 134 05/06/2003) specifies the

different aspects that must be taken into account in the management of radioactive waste at these facilities.

The CSN requires from ENRESA the preparation of a methodology for acceptance of waste packages at the El Cabril disposal facility and a set of technical and administrative procedures. These must develop their practical implementation of, both in terms of the relationship between ENRESA and producers of waste and in the activities that are the exclusive responsibility of ENRESA in the acceptance of different types of packages.

The acceptance criteria for packages of LILW were established in accordance with Ministerial Order of 9 October 1992. El Cabril's current authorisation for operation, granted by Ministerial Order of 5 October 2001 determines that the acceptance criteria for waste at this facility form part of the official operation documents. These acceptance criteria were subsequently developed as indicated in Section 16.2.4.

ENRESA has established a methodology for the acceptance of LILW and VLLW at the El Cabril which considers the different states and interrelations for disposal.

Producers of radioactive waste at nuclear facilities are responsible for conditioning packages so that they comply with acceptance criteria. ENRESA must verify, through a preliminary process that the packages comply with the requirements referred to. A supervision system has also been established based on documentary controls and in the field of the generation of waste, inspections upon delivery to ENRESA and the performance of programmed verification tests on real packages received.

In relation to the CSN's requirement of ENRESA to prepare specific acceptance processes that cover the generation on the part of producers of disposal units for direct disposal in the cells at El Cabril, within the period covered by the Sixth Annual Report, ENRESA has carried out production of these units[17] for the set of LILW generated by the José Cabrera dismantling project. Until now, these processes were exclusively carried out at the ENRESA facilities at El Cabril.

In the case of HLW, Instruction IS-29 on safety criteria at temporary spent fuel and high level radioactive waste storage facilities establishes that the mandatory Safety Study, required by the RINR in the licensing of the facility must contain, among other elements, the acceptance criteria for spent fuel casks and radioactive waste. This same instruction establishes that the licensee must complete a safety review at regular intervals (Periodic Safety Review), in accordance with the current regulation, including deviations from limits and acceptance criteria during storage and the changes that occur in the interdependencies in the different phases of management of SF and HLW. If any significant change in the acceptance criteria of the waste and spent fuel casks is proposed, the safety of the facility must be reviewed independently of the periodic safety reviews.

11.4. Measures to provide effective protection of individuals, society and the environment, by applying at the national level suitable protective methods as approved by the regulatory body, in the framework of its national legislation which has due regard to internationally endorsed criteria and standards

Article 38 of the Nuclear Energy Act requires licensees of nuclear and radioactive facilities to adopt the appropriate measures at all phases of management of spent nuclear fuel and radioac-

[17] *Véase 16.2.4*

tive waste for the purpose of adequately protecting persons, things and the environment both in the present and the future, against radiological risk.

In addition, Royal Decree 102/2014 of 21 February 2014 for the responsible and safe management of spent nuclear fuel and radioactive waste has completed the legislative, regulatory and organisational framework in accordance with Council Directive 2011/70/Euratom. Article 12.3 of the aforementioned legal provision states that during the process of granting the authorisation for radioactive waste management facilities, the demonstration or the Safety Study for the different phases of the life cycle of the facilities is required in accordance with the RINR. It is also pointed out that the safety demonstration will be in proportion with the complexity of the operations and with the magnitude of the associated risks, in accordance with the instructions, circulars and guides of the Nuclear Safety Council.

At present, the national regulatory framework shows the importance of both the mechanisms for direct protection of people and the environment and those relating to deferred safety, as, in the management of radioactive waste the remaining radiological risk for people and the environment must be controlled for long periods of time.

During the licensing and control of the El Cabril disposal facility, the applicable safety principles and criteria on these matters have been set by international bodies such as the International Commission on Radiological Protection and the International Atomic Energy Agency and have introduced specific safety requirements established in the original regulation of countries where the facilities taken as a reference are found.

11.5. Measures to take into account the biological, chemical and other hazards that may be associated with spent fuel and radioactive waste management

Biological, chemical and other hazards associated with spent fuel and radioactive waste management are regulated by the limitation in the content of substances present in radioactive waste which are disposed of at El Cabril.

In this sense, the acceptance criteria of the facility are a fundamental element in the prevention of these risks. These include, among other restrictions, those pertaining to the limitation of the presence of substances whose major potential risk is not related to radioactivity and those susceptible to causing exothermic chemical reactions. It is the producer's responsibility to declare the presence of toxic, chemical or biological substances in radioactive waste, to minimise their generation and identify them so that ENRESA can record their quantity at the facility. ENRESA works in cooperation with waste producers to treat specific aspects of this problem.

The environmental impact declaration process to which nuclear facilities are subject as part of the authorisation and licensing process is another preventive way of dealing with the question of biological and chemical risks.

11.6. Measures to prevent greater repercussions on future generations than the present one

Since 1985, the CSN has pointed out that the basic objective of the radioactive waste disposal facility, from the nuclear safety and radiological perspective is to guarantee that radioactive waste is isolated from man and from the environment in such a way that any potential release of

nuclides do not result in an unacceptable exposure of persons to radiation both for present and future generations.

Royal Decree 102/2014 of 21 February 2014 for the responsible and safe management of spent fuel and radioactive waste establishes that the purpose of the regulation of the responsible and safe management of spent nuclear fuel for the purpose of preventing the imposition of undue burdens on future generations.

The need is also stipulated to use passive safety systems with components whose functionality is ensured by physical processes which are not dependent on external energy.

The passive safety characteristics are in the design basis of the El Cabril facility, which is the only existing radioactive waste disposal facility in Spain. The close-to-the-surface type disposal system in concrete cells is based on the imposition of engineering and natural barriers that provide safe containment and isolation of the LILW. Other containment technologies are applied, including chemical barriers through the immobilisation of waste in solid, stable and resistant material which decelerates the migration of radionuclides without impeding the movement of water. At El Cabril there is a network of infiltration control that allows for the verification of these barriers.

11.7. Measures to avoid imposing undue burdens on future generations

The regulatory framework in Spain establishes, through Law 25/1964, the Nuclear Energy Act, Law 54/19997 on the electricity sector and Royal Decree 102/2014 for the responsible and safe management of spent nuclear fuel and radioactive waste, the specific measures for this purpose, related to the assignment of responsibilities, the provision of funds for the financing of activities provided for in the GRWP and the forecasts for needs of industrial control.

The legislation establishes the responsibility of the different agents involved in the management of spent fuel: Ministry of Energy, Tourism and Digital Agenda, Regulatory Body (CSN), producers and ENRESA, as detailed in Articles 20 and 21 of this Report and elsewhere.

Specifically, Royal Decree 102/2014 also makes it mandatory that the cost of radioactive waste management be borne by those who have generated said materials and not by any undue burden on future generations.

In relation to this section, the legal framework is provided by the constitution, application and mechanisms for the management and guarantee of the economic Fund established for the financing of these activities of the GRWP, among them radioactive waste management, the details of which can be found in Annex D. Through the provisions of said Fund, the generation that benefits from the production of the original nuclear electricity pays the costs associated with the waste generated until its final disposal.

The Law on Nuclear Energy also establishes that the State shall become the licensee of radioactive waste once it has been placed in disposal and shall also assume responsibility for surveillance which, where necessary, may require the closure of a nuclear facility once the period established for the corresponding authorisation has elapsed.

The El Cabril disposal facility is conceived in accordance with a concept of passive safety which functions during its operative life and during the closure phase. Passive safety refers to the fact that after decommissioning the facility will not depend on continuous active and ambitious measures, but will be subject to active and passive institutional controls that strengthen safety and ensure compliance with safety criteria specified by the regulatory authorities.

In this sense, Directive 2011/70/Euratom highlighted the ethical obligation of each Member State to avoid placing on future generations any undue burden arising from radioactive waste and established the community framework to ensure responsible and safe management of such waste.

In line with Royal Decree 102/2014, which saw its transposition into Spanish law, its objective is

> *"the regulation of responsible and safe management of spent nuclear fuel and radioactive waste where they arise from civil activities, in all their phases, from generation to disposal, for the purposes of avoiding the imposition on future generations of undue burdens, and the regulation of some aspect relating to the financing of these activities in accordance with the community framework".*

As a result of the above and in accordance with Royal Decree 102/2014, the next General Radioactive Waste Plan must include in its content

> *"the concepts or plans for the period subsequent to the operational phase of a disposal facility, indicating the period of time for which the pertinent control, along with the measures that must be used to preserve knowledge of said facility long term, are to be maintained".*

With regard to the radioactive facilities of the nuclear fuel cycle, whose dismantling and closures are not covered by the Fund for financing the activities of GRWP, these shall require, prior to the entry into force of the provision of a financial guarantee or bond, guaranteeing the future dismantling and management of the resulting radioactive waste.

Similarly, authorisation for the dismantling and closure of facilities for disposal of spent nuclear fuel and radioactive waste, introduced in the regulation of the licensing of facilities as a result of Directive 2011/70/Euratom, seeks to guarantee the long-term safety of the storage system which shall determine, in each case, the areas of the site that must be subject to control and radiological monitoring or any other form of monitoring for a determined period of time.

Article 12
Existing Facilities and Past Practices

Article 12. Existing Facilities and Past Practices

Each Contracting Party shall take the appropriate steps to ensure that:

i) the safety of any radioactive waste management facility existing at the time the Convention enters into force for that Contracting Party and to ensure that, if necessary, all reasonably practicable improvements are made to upgrade the safety of such a facility;

ii) the results of past practices in order to determine whether any intervention is needed for reasons of radiation protection bearing in mind that the reduction in detriment resulting from the reduction in dose should be sufficient to justify the harm and the costs, including the social costs, of the intervention.

Measures adopted to examine the safety of the El Cabril facility

Upon the entry into force of the Joint Convention, the only significant existing facility for the management of waste was the El Cabril disposal facility. Although safety is in line with all of the

provisions for the Convention for facilities prior to its entry into force, the paragraphs below are included in accordance with the requirements of the Article.

As of today, the mechanisms adopted to examine the safety of the El Cabril facility described in previous Reports under the Convention remain in force.

From the previous Report, in accordance with the requirements of the CSN, a new review of the Periodic Safety Review of the El Cabril disposal facility has been presented, corresponding to the 2002-2011 period, with an improved evaluation of the global safety and radiation protection of the facility.

The Supervision and Monitoring System of the El Cabril Disposal Facility was implemented in the year 2014 after a pilot programme which began in 2013. The purpose of this Supervision and Monitoring System, among others, is to provide a basis upon which inspection programme for points such as areas of attention, frequency and resources can be adjusted, as mentioned in the previous Report.

Article 13
Siting of Proposed Facilities

Article 13. Siting of Proposed Facilities

1. *Each Contracting Party shall take the appropriate steps to ensure that procedures are established and implemented for a proposed radioactive waste management facility:*
   - i. *to evaluate all relevant site-related factors likely to affect the safety of such a facility during its operating lifetime as well as that of a disposal facility after closure;*
   - ii. *to evaluate the likely safety impact of such a facility on individuals, society and the environment, taking into account possible evolution of the site conditions of disposal facilities after closure;*
   - iii. *to make information on the safety of such a facility available to members of the public;*
   - iv. *to consult Contracting Parties in the vicinity of such a facility, insofar as they are likely to be affected by that facility, and provide them, upon their request, with general data relating to the facility to enable them to evaluate the likely safety impact of the facility upon their territory.*
2. *In so doing, each Contracting Party shall take the appropriate steps to ensure that such facilities shall not have unacceptable effects on other Contracting Parties by being sited in accordance with the general safety requirements of Article 11.*

13.1 Proposed new radioactive waste management facilities

The disposal of low and intermediate level waste (LILW) and short-life waste in Spain is carried out at the El Cabril disposal facility. The main disposal facility has been in operation since the year 1992 after its corresponding licensing by the authorities. But in the mid-2000s, the new waste forecasts to be managed as a result of the dismantling of some nuclear power plants and potential incidents at others led to the planning of a complementary facility for the disposal of very low level radioactive waste (VLLW) located at the same site at El Cabril. Overall, this facil-

ity would have a combined capacity of 130,000 m3 and would be comprised of four cells. At present, two of these have been built and are in operation. The first cell (Cell 29) has been in operation since October 2008, the second (Cell 30) since July 2016.

The strategy for the temporary management of high level waste and special waste (HLW and SW) consists of storing it along with spent fuel (SF) at the Centralised Temporary Storage facility to be built in the municipality of Villar de Cañas. The facility has been in the licensing phase since January 2014.

The dismantling of the José Cabrera nuclear power plants led to another batch of special waste, as a consequence of the cutting of some of the reactor vessel internals. This waste, which is not suitable for disposal at El Cabril, is currently stored in four casks located in the ITS facility, along with the spent fuel. In the future, when it is built, they will be sent to the CTS.

13.1.1. Low and Intermediate Level Waste (LILW)

Since 2008, very low level waste (VLLW) is sent for disposal at a complementary facility located at the solid radioactive waste disposal facility of Sierra Albarrana (El Cabril). The authorisation for the start-up was awarded by MINETAD on 21 July 2008, subsequent to the favourable report on the part of the CSN.

The design of the facility proposes that it consist of four disposal cells, numbered 29, 30, 31 and 32) with a capacity for 130,000 m^3.

In July 2016, ENRESA began operating at Cell 30, with an estimated capacity of 39,000 m^3.

As indicated in previous Reports, Disposal Cell 30 has been built on a natural depression of the terrain immediately north of the previous VLLW disposal cell (Cell 29).

Cell 30 consists of two sections (I and II) for waste disposal, one above the other and with retaining dyke downstream for each of these. Both sections shall be surrounded by berms to allow for the circulation of vehicles around them.

During the operation of the cell, waste is protected from rain water at all times by way of a removable cover. Each of the two sections has its own leachates evacuation networks which are joined at the rock dyke by a shared outlet to the control tank, located downstream from the cell.

When each disposal cell is full, it shall be closed by final covering which consists of several layers of earth clay and gravel, among other components and final layer of vegetation.

13.1.2. High level waste (HLW) and special waste (SW)

The Spanish strategy for the temporary storage of high level and special waste, as explained in Section B, consists of centralising storage at the future CTS along with spent nuclear fuel.

Without this facility, the generation of any special waste as a result of the dismantling works at the José Cabrera nuclear power plant, specifically the cutting of the reactor vessel internals, has made it necessary to install four dry storage casks for storage at the ITS facility on-site. In the future, this waste will be transferred to the CTS facility.

With respect to the disposal of high level waste and special waste, the strategy and therefore possible new facilities remain pending the update of considerations contained in the General Radioactive Waste Plan with a view to new developments introduced by European legislation, Directive 2011/70/Euratom, and the latest international developments.

13.2. Criteria for the assessment of all factors related to siting that might impact on security

a) LILW

The Safety Study of the El Cabril disposal facility took into account, among other factors, those that determine the acceptability of the radiological consequences of the potential release of radionuclides into the environment. Among others, there are those related to the action of the natural barriers or characteristics of the site that might delay or mitigate the migration of the radioisotopes.

At the time, the fundamental rule adopted established the concept of intrinsic safety which, in terms of the site would require that safety, in the free use phase of same, is based on the limitation of inventory and on the characteristics of the geological barrier. In a complementary manner, the criteria used for isolation from ground and surface water were taken into account as well as the control of possible discharges in case of releases in the event of faults which must be presented for a site for these types of disposal facilities.

The very low level waste (VLLW) disposal unit, the second cell of which became operational in the year 2016, constitutes a modification within the initial design plans of the facility. In accordance with Spanish regulation and in particular the RINR, its construction has required an authorisation for the modification of the pre-existing facility.

This disposal facility uses the French facility for the disposal of very low level radioactive waste at Morvilliers as a reference. The supporting documentation for the new disposal facility includes information pertaining to the criteria for the assessment of factors influencing safety.

When weighting the characteristics of the site, the following suitability criteria may be taken into account, revised periodically in the context of the review of the facility, which is carried out at least every ten years:

- ✓ Suitable lithological characteristics.
- ✓ Tectonic stability and low seismic activity.
- ✓ Known hydrogeology that can be modelled.
- ✓ Known hydrochemistry.
- ✓ Even topography not susceptible to flooding.
- ✓ Appropriate geotechnic properties.
- ✓ Conservation of potentially usable area in the extension of the facilities.
- ✓ Availability of sufficient information on the site.
- ✓ Accessibility and communication.
- ✓ Proximity to current facilities.

b) HLW and SW

The process for the licensing of nuclear facilities takes into account, throughout all phases, the assessment of the characteristics of the site. Specifically, the prior authorisation is a specific authorisation that reflects the acceptability of the proposed site. With the request for preliminary authorisation of the site, the site characterisation study of the area of influence of the facility is presented, which must include sufficient information on the parameters that might impact on nuclear safety or radiologi-

cal protection, including demographic and ecological parameters, and activities related to spatial planning. The scope of these studies depends on the complexity and the life of the facility.

13.3. Criteria to assess the radiological repercussions for the environment and nearby population

a) LILW

In relation to the Report to the Joint Convention, the only reportable incident in the LILW section was the entry into operation of Cell 30 for disposal of VLLW. This repository is a modification of the existing facility; therefore it has been included in the Safety Study (SS) of the El Cabril disposal facility, using the same criteria and methodology and without any variation to the maximum authorised radioactive inventory for this facility. Just as in the preceding the SS, the situations analysed include present and future conditions, events associated with the normal evolution of the disposal facility and more improbably events such as intrusion. The SS has two objectives:

- To formulate acceptance criteria of the LILW for disposal.
- To determine that an acceptable level of protection for human health and the environment is obtained both now and in the future.

The methodology for this is based on that established by international forums and the ISAM and ASAM projects, promoted by the IAEA and, as principal elements:

- The context of the study, which identifies its time framework, its objectives, its criteria for radiation protection and security, etc.
- The description of the system or description of the characteristics of the components: waste, operational practices, design of facilities.
- The development and justification of scenarios and their assessment. These scenarios serve two purposes, mentioned previously.
- Analysis of results.

b) HLW and SW

The measures to assess the radiological repercussions in the environment and the surrounding population corresponding to the favourable declaration of the generic design of the CTS facility, the pre-licensing phases, has been included in Section G paragraph 6.3 of this Report, pertaining to spent fuel, the content of which is also applicable to HLW and SF, as it is the same facility.

As indicated in 13.2, the modification of the design of the Individualised Temporary Storage facility at the José Cabrera nuclear power plant did not lead to any changes in the radiological criteria of said facility to locate itself below the established limits.

There is no facility planned in Spain for the disposal of this waste.

13.4. Information for the public on the safety of planned radioactive waste management facilities

The general questions pertaining to information for the public and the public participation (role of the regulatory body and other authorities, the duty to inform citizens, local information committees at nuclear power plants, website, SISC, publicity of standards projects, Law 21/2013,

etc.) have already been covered in Article 20.2.8, like those specific to the CTS in Article 6.4 of this Report.

The first article describes the obligation of the CSN to provide access for the public to the information on nuclear and radioactive facilities and therefore covers the management of radioactive waste generated in all of them, including nuclear power plants, other nuclear facilities, such as the El Cabril disposal facility, fuel cycle facilities and facilities intended for the use of radioisotopes in medicine, industry, research and teaching. The second article summarises public participation in the process of preliminary authorisation of the CTS.

In relation to the provision of a local information committee, this only applies to nuclear power plants and, as a consequence, the management and storage of radioactive waste produced therein.

Article 14
Design and Construction of Facilities

Article 14. Design and Construction of Facilities

Each Contracting Party shall take the appropriate steps to ensure that:

i) the design and construction of radioactive waste management facilities provide for suitable measures to limit possible radiological impacts on individuals, society and the environment, including those from discharges or uncontrolled releases;

ii) at the design stage, conceptual plans and, as necessary, technical provisions for the decommissioning of a radioactive waste management facility other than a disposal facility are taken into account;

iii) at the design stage, technical provisions for the closure of a disposal facility are prepared;

iv) the technologies incorporated in the design and construction of a radioactive waste management facility are supported by experience, testing or analysis.

Low and intermediate level waste management facilities are in the same nuclear facilities that generate such waste or at the El Cabril facility, where they are brought for disposal. The first were assessed and authorised within the licensing process of the facilities themselves, which is why this article only refers to the El Cabril disposal facility.

14.1. Limitation of the possible radiological consequences for individuals, the environment and society

According to Annex B of this Report, referring to the licensing, authorisation for construction gives the licensee permission to begin construction of a facility and request the authorisation to operate. At the new facilities, this authorisation must be presented before the competent authorities along with a series of documents, which include those highlighted in the Preliminary Safety Study (PSS). The Nuclear and Radioactive Facilities Regulation (RINR) gives the Autonomous Community further competencies in relation to spatial planning and the environment of the territory where a facility is located, among the recipients of this documentation, for which it has the capacity to present allegations.

In accordance with the RINR (Article 12), the El Cabril facility obtained its construction authorisation by Ministerial Order on 31 October 1989. The construction of the new complementary facility for LILW at El Cabril, which began operation in the year 2008, was undertaken as a design modification of the existing facility and was executed sharing the same safety criteria.

The general safety objectives defined in the design and construction of the El Cabril disposal facility were the following:

- ✓ Immediate protection, during the operation, deferred in the phases of monitoring and control and free use, of people and the environment.
- ✓ To allow the free use of the site in reasonable time, that is, that the lands be used for any purposes, without limitations arising from the disposal facility.

Compliance with these objectives requires the application of the following basic criteria:

- ✓ Isolation of radioactivity stored in the environment (or biosphere) during the operation and supervision and control, thanks to the suitability of the site and the elements of the facility.
- ✓ Limitation of the activity of radionuclides present in the storage units, the manner in which the radiological impact is acceptable in any foreseeable circumstance and so that waste is compatible with the free use of the site.

The current authorisation for operation included in the modification of the design of the VLLW disposal facility at El Cabril, authorises ENRESA to use the corresponding disposal cells, with no intention of subsequent recovery, the disposal units that comply with acceptance criteria and to close the covers of these cells definitively. Prior to execution of closure, this proposition must be favourably received by the CSN.

14.2. Technical provisions for the decommissioning of radioactive waste management facilities

In accordance with the current regulations, the request for construction authorisation of any nuclear or radioactive facility must include the documentation to be presented for technological, economic and financial planning for its decommissioning and closure. All of the above aspects are defined in the RINR, the latest version of which was published in 2008 and which reserved for the CSN the competency to define the scope, content and development of the necessary documentation.

In the particular case of nuclear power plants, at the end of the operating lifetime, the licensees are obliged to carry out preparatory activities so that ENRESA assumes the license and commences dismantling activities.

14.3. Technical provisions for the decommissioning of the radioactive waste disposal facility

According to the Fifth National Report, the RINR establishes that the authorisation for dismantling and closure which, at that time, entitles ENRESA, as licensee of the facilities for the storage of spent nuclear fuel and radioactive waste, at the beginning of the final engineering works and other works that are required to ensure the long-term security of the storage system. Also dismantling activities at auxiliary facilities that are so determined, allow finally for the delimitation of the area that must be subject to control and radiological or another form of monitoring during the period of time determined and the liberation of control of the remaining areas of the site. The

dismantling and closure process ends with a declaration of closure issued by MINETAD, subject to a prior report by the CSN.

The systems for the closure of the El Cabril disposal facility and those which must be operative during the monitoring and control phase of the facility are included in the Preliminary Safety Study, presented with the request for authorisation for construction.

At the end of the operational phase of the facility, closure activities will be carried out to prepare it for the following phase. It will be necessary to complete works on the disposal facilities and their annexes (covers, water networks), the evacuation and disassembly of the operating facilities (buildings and equipment) that are not required and the installation of all the elements necessary for the monitoring and control phase not already delivered.

The seepage control network, which will operate throughout the phases of operation and surveillance and control with minimum maintenance, is designed to easily identify and locate any possible anomaly in any of the disposal cells. For this purpose, the network piping has been installed in accessible underground galleries of reinforced concrete that run longitudinally beneath the cells and has been designed with sufficient inclination and dimensions to ensure drainage by gravity to the final control tank. ENRESA will maintain the property above the soil, thus preventing any deterioration as a result of uncontrolled human intervention and ensuring monitoring and maintenance of the cover, the seeping waters control network and monitoring devices.

Before the monitoring and control period begins, a specific Environmental Radiation Monitoring Programme will be prepared which must be approved by the Authorities before closure. This Programme will be based on the experience acquired, the checks carried out and the methods used during the operation period.

14.4. Technologies used for radioactive waste management

Nuclear power plants and CTS

The introduction and development in Spanish regulation of the concept of the "reference nuclear power plant" guarantees the inclusion of consolidated and proven technology, without affecting the introduction of innovation. Existing radioactive waste management facilities at Spanish nuclear power plants were designed and built as part of the plant following the standards applied at reference nuclear power plants in the United States and Germany.

The same applies for dry storage of special waste at the José Cabrera nuclear power plant in metal-concrete casks, whose security and reliability were proven by international experience.

In the future, the CTS will house this special waste, other forms from future dismantling and high level waste from reprocessing. As indicated in section 7.3, for the case of spent fuel, the technology used for this facility has been widely used in operation in the international context.

El Cabril

At the time, the conceptual development of the disposal facility was based on the experience acquired in countries with this type of facility and based on the basic safety objectives and technical options. After these considerations, the surface disposal model was chosen, with the adoption of engineering barriers, developing the concept that takes French disposal facilities as a reference.

The auxiliary facility for VLLW, Cell 30, was brought into operation in 2016 and took as a reference the previous facility built and operated by ENRESA from 2008, Cell 29. This, at the time, took into account the facilities in operation in other countries, principally the TFA facility at Morvilliers in France.

Article 15
Assessment of Safety of Facilities

Article 15. Assessment of Safety of Facilities

Each Contracting Party shall take the appropriate steps to ensure that:

i) before construction of a radioactive waste management facility, a systematic safety assessment and an environmental assessment appropriate to the hazard presented by the facility and covering its operating lifetime shall be carried out;

ii) in addition, before construction of a disposal facility, a systematic safety assessment and an environmental assessment for the period following closure shall be carried out and the results evaluated against the criteria established by the regulatory body;

iii) before the operation of a radioactive waste management facility, updated and detailed versions of the safety assessment and of the environmental assessment shall be prepared when deemed necessary to complement the assessments referred to in paragraph (i).

15.1. Measures adopted before the construction of low and intermediate level waste management facilities

In Spain, the facilities for the management of LILW are treatment plants and temporary storage facilities located on-site at nuclear power stations, at the Juzbado fuel element factory and the CIEMAT nuclear facility. There are also systems for the treatment, conditioning and temporary storage of waste at the El Cabril disposal facility.

Radioactive facilities, where ionising radiation applications are developed for medical, industrial and research purposes also have suitable infrastructures for the temporary storage of the waste they generate, until it is submitted to ENRESA.

Among the documents the licensee of the preliminary authorisation must present in support of constructions is a Preliminary Safety Study or PSS (Article 17.e of the RINR).

The PSS will contain a description of the site and its surrounding area, with current data on the parameters impacting safety and radiation protection, including demographic, ecological and, above all, land and water uses and any additional data that might contribute to a better understanding of the site and might impact on monitoring and verification plans of the aforementioned representative parameters.

The PSS will also contain a description of the proposed facility in which the adopted criteria will be included in the design of those components and systems that depend on the safety of the facility and an analysis of foreseeable accidents and their consequences.

In addition, before the authorisation for construction of the facility, an analytical radiological study will be carried out, which will estimate the potential radiological impact on the population

and the environment. The results of this study will be included in the PSS documentation and will serve as the base for the preparation of the pre-operational radiological monitoring programme (PVRAP) which allows for the reference level or radiological background of the monitored area to be established.

In Annex B of this Report, detailed information is included on the authorisation process for facilities that includes a systematic assessment of security and an environmental assessment in accordance with the risk posed by the facility and which covers its operation lifetime.

It must be pointed out that the RINR review process is currently in progress at the CSN, as one of the objectives sought in the development of the process of authorisation for nuclear facilities for the disposal of radioactive waste in accordance with the experience acquired in existing regulation and incorporating specifically those aspects of safety and radiation protection that are considered necessary but are yet to be regulated.

15.2. Measures adopted prior to the construction of low and intermediate level radioactive waste disposal facilities

In Spain, one low and intermediate level radioactive waste disposal facility is currently in operation (1992) and also another very low level radioactive waste disposal facility (2008), both located at the El Cabril facility. Both are considered nuclear facilities and therefore before their construction the regime of authorisation and safety assessments was applicable, which have been indicated in Section E of this Report.

The information relating to measures adopted before the construction of waste disposal facilities has remained unchanged, so it is the same as has been included in successive National Reports to this Joint Convention, performing a systematic safety assessment and an environmental assessment for the period immediately after closure and assessing the results based on the criteria established by the regulatory body.

Moreover, Royal Decree 102/2014, of 21 February, on the responsible and safe management of spent nuclear fuel and radioactive waste, modified the RINR by establishing, upon the cessation of operation of radioactive waste disposal facilities, an authorisation for dismantling and closure and a declaration of closure. These administrative activities entitle the licensee to complete engineering and other works that are required to guarantee the long-term safety of the disposal system, and the dismantling activities for determined auxiliary facilities, allowing for the delimiting of areas that should be subject to control and radiological or other forms of monitoring, for a determined period of time and the release of control of other areas of the site.

Royal Decree 102/2014 establishes that all aspects of safety and protection during the closure and control and monitoring phase shall be regulated through the CSN Instruction, which must include the scope and content of the demonstration or safety study in each phase.

As has been mentioned, the RINR review process is currently in progress at the CSN, as one of the objectives sought is the development of the process of authorisation for nuclear facilities for the disposal of radioactive waste in accordance with the experience acquired in existing regulation and incorporating specifically those aspects of safety and radiation protection that are considered necessary but are yet to be regulated.

In general and in relation to Article 15 of the Joint Convention, Article 12.3 of the aforementioned Royal Decree states that during the process of granting the authorisation for radioactive waste management facilities, the demonstration or the Safety Study for the different phases of the life cycle of the facilities is required in accordance with the RINR. It is also pointed out that the safety demonstration will be in proportion with the complexity of the operations and with

the magnitude of the associated risks, in accordance with the instructions, circulars and guides of the Nuclear Safety Council.

As part of the mandatory documentation for the process of the authorisation for construction and the authorisation for operation at El Cabril, the licensee presented to the competent authorities the PSS and SS, with all the corresponding analysis and the demonstration of the safety, considering the possible future evolution of the disposal system, taking into account the mechanisms for the release and migration of radioactivity, the forms of exposure to members of the public and analysis of the radiological consequences of the scenarios of human intrusion, all of which were postulated. In relation to the long-term safety assessments, from the start of the licensing process, the international references for the methodological approach to use in these assessments were considered. In particular, before the authorisation for the construction of the facility, the safety analysis for the phase subsequent to the closure of the disposal system was consolidated and perfected during the licensing process for the authorisation for operation. In the study of the objectives and safety criteria of the French standard RFS-I.2 applicable to the demonstration of the safety of the surface storage facilities for nuclear waste.

The CSN safety guide reference GSG-09.04: *Long-term Safety assessment of Surface Disposal Facilities for Low and Intermediate Level Radioactive waste*, also establishes the concept of the defence in depth through the multi-barrier system for the confinement of radioactive waste: waste conditioning matrix, disposal cells and geological environment. The events and scenarios analysed in the safety demonstration must be based on the current situation of the disposal system and consider the possible future evolution, for which an initial list will be drawn up of features, events and processes (FEP) which might affect the behaviour and the long-term safety of the facility. The safety demonstration must include the criteria for the sifting of FEP and must document and justify the process of selection or exclusion of each of them.

15.3. Measures adopted before the operation of low and intermediate level radioactive waste management facilities

The information pertaining to measures adopted before the operation of the waste management facilities has remained unchanged, which is why it has been included in successive National Reports to this Joint Convention.

As previously mentioned, Royal Decree 102/2014 of 21 February 2014 for the responsible and safe management of spent nuclear fuel and radioactive waste has completed the legislative, regulatory and organisational framework in accordance with Council Directive 2011/70/Euratom.

In the case of radioactive waste management facilities associated with radioactive facilities other than those involved in the nuclear fuel cycle, an authorisation for functioning is exclusively required, the request for which must be accompanied by a Descriptive Dossier which will include, among other elements, the management systems for solid, liquid and gaseous radioactive waste. In this case, the request must also be accompanied by a Safety Study which will consist of an analysis and assessment of the risks that might arise from the operation of the facility in normal circumstances or as a result of an incident. Sufficient data shall be included so that the competent authorities can carry out an analysis of the risks of the facility independently of those presented by the requesting party.

The RINR requires, for the extension of request for the authorisation of dismantling and closure of radioactive waste disposal facilities (Article 12.1), that the aspects of safety and radiation protection included in the post-closure control and monitoring phases, and specifically those contained in the safety demonstration or safety study for each phase, must be regulated by the CSN Instruction. In relation to this matter and by way of recommendation, in 2013 the CSN pub-

lished the safety guide reference GSG 0904 *Long-term Safety assessment of Surface Disposal Facilities for Low and Intermediate Level Radioactive Waste*. The purpose of this guide is to describe the minimum content of the safety demonstration of disposal of radioactive waste located on the surface.

As has been mentioned, the RINR review process is currently in progress at the CSN, as one of the objectives sought is the development of the process of authorisation for nuclear facilities for the disposal of radioactive waste in accordance with the experience acquired in existing regulation and incorporating specifically those aspects of safety and radiation protection that are considered necessary but are yet to be regulated.

Article 16
Operation of Facilities

Article 16. Operation of Facilities

Each Contracting Party shall take the appropriate steps to ensure that:

i) the licence to operate a radioactive waste management facility is based upon appropriate assessments as specified in Article 15 and is conditional on the completion of a commissioning programme demonstrating that the facility, as constructed, is consistent with design and safety requirements;

ii) operational limits and conditions derived from tests, operational experience and the assessments, as specified in Article 15, are defined and revised as necessary;

iii) operation, maintenance, monitoring, inspection and testing of a radioactive waste management facility are conducted in accordance with established procedures. For a disposal facility the results thus obtained shall be used to verify and to review the validity of assumptions made and to update the assessments as specified in Article 15 for the period after closure;

iv) engineering and technical support in all safety-related fields are available throughout the operating lifetime of a radioactive waste management facility;

v) procedures for characterization and segregation of radioactive waste are applied;

vi) incidents significant to safety are reported in a timely manner by the holder of the licence to the regulatory body;

vii) programmes to collect and analyse relevant operating experience are established and that the results are acted upon, where appropriate;

viii) decommissioning plans for a radioactive waste management facility other than a disposal facility are prepared and updated, as necessary, using information obtained during the operating lifetime of that facility, and are reviewed by the regulatory body;

ix) plans for the closure of a disposal facility are prepared and updated, as necessary, using information obtained during the operating lifetime of that facility and are reviewed by the regulatory body.

16.1. Waste management at nuclear and radioactive facilities other than El Cabril

16.1.1. Authorisation to operate: limits and conditions

Operational experience

The RINR establishes the documentation that must accompany the request for authorisation to operate, distinguishing between radioactive facilities and nuclear facilities, in accordance with the explanations in previous reports and in Annex B.

The licensee must issue a series of reports and documentation for regulatory control of their activities in accordance with the provisions of the RINR and the limits and conditions set in the annex to the authorisation to operate. These reports are different for the case of nuclear and radioactive facilities.

Radioactive waste management at the nuclear power plants is conducted in accordance with the Operating Technical Specifications (OTSs) and the Radioactive Waste Management Plan (RWMP), both mandatory.

According to Article 20 of the RINR, all Spanish nuclear facilities must have a RWMP. The CSN established Safety Guide 9.3 on the criteria and technical basis for the preparation of the RWMP by licensees of nuclear facilities; and, through technical instructions required in 2009 at all nuclear facilities, the adaptation of the radioactive waste and spent fuel management plan to the content of Safety Guide 9.3.

On the other hand, the OTSs establish the Operating Technical Conditions, the applicability, the necessary actions and the monitoring requirements necessary to comply with the limit conditions. They also contain the limit values of variables that affect safety, operational limits of automatic protection systems, the minimum operating conditions, the review programme, calibrating and inspections and periodic testing of different systems and components and operational control.

To develop and detail the monitoring requirements of the OTSs, monitoring procedures are prepared by the different departments involved in the operation of the power plant.

Within the procedures for nuclear power plants, the analyses of own and other operational experiences may result in actions to improve both aspects of design and operational procedures. Some of the reports analysed are generated by INPO/WANO, US-NRC and suppliers.

16.1.2. Procedures for the operation, maintenance, radiological monitoring, inspection and testing

At nuclear power plants there are procedures that regulate the performance of different activities related to the operation, maintenance, radiological monitoring and inspection of structures, systems and equipment used at radioactive waste management facilities.

The RWMP is aimed at collecting the criteria and instructions that ensure that the management of the radioactive waste and spent nuclear fuel generated at these facilities is safe and optimised, considering the advances in regulation and technology, taking into account:

- ✓ The existing situation at each facility in terms of generation, management and, where applicable, the evacuation of waste.

- ✓ The identification of the origin of waste and the history of spent fuel.
- ✓ The study of alternatives to the systems and management processes and possible improvements in same.
- ✓ Justification of the suitability of current management and need to implement improvements.
- ✓ Planning of the implementation of improvements identified.

The RWMP is the reference document for the management of radioactive waste generated at nuclear facilities, both in operation and in the dismantling and decommissioning phase, containing the information necessary to allow analysis of existing management. It applies to the management of all radioactive waste, regardless of the levels of radioactivity and the waste materials with radioactive content suitable for clearance, to special waste and to spent fuel. Moreover, it fits within the objective of improvement in management of waste and spent fuel generated at each facility.

The monthly operating report submitted to the CSN provides information on the storage status of solid low and intermediate level radioactive waste and possible variations with respect to the previous report, including a list of the packages produced and removed from storage.

16.1.3. Engineering services and technical support

The organisation of all nuclear facilities is similar, with a support organisation not located on the plant and which performs support functions and the personnel of said operation who perform functions directly related to the activities of the plant. This support organisation, in many cases, includes departments with responsibilities relating to the management of fuel and radioactive waste.

Nuclear power plants are also provided with engineering services and technical support to facilitate compliance with and verification of safety criteria in the area of spent fuel storage, within the scope described in the operational regulations.

In the framework of the Periodic Safety Review, a programme for the assessment and improvement of organisational safety and human factors has been included.

The CSN has been carrying out actions to verify that the processes used by licensees to maintain the provisions, competencies and motivation of human resources, both own staff and contractors, guarantee in all cases the maintenance and improvement of the safety of nuclear facilities.

16.1.4 Notification of incidents

In the previous reports, the requirements of the RINR were indicated with respect to the information to be facilitated to authorities with responsibility for the issue, on any event that involves an alteration in the normal functioning of a facility or that may affect nuclear safety or radiation protection.

Also, Law 33/2007, amending Law 15/1980, creating the Nuclear Safety Council, and the RINR itself, establish the duty of workers at nuclear and radioactive facilities to communicate any fact that might affect the safe operation of the facilities, protecting them from any possible reprisals.

With the aim of providing orientation to licensees of nuclear facilities on reportable events in this sense, on 30 July 2014 the CSN reviewed Instruction IS-10, establishing the criteria for reporting of events to the CSN on the part of the nuclear power plants. Said instruction establishes

the notification criteria and reportable events, setting the maximum reporting period for each through the regulator.

To complement this, nuclear facilities, in accordance with the RINR, must establish an internal Emergency Plan in which measures foreseen by the licensee are developed and responsibility is designated to respond in accident conditions, with the aim of mitigating the consequences, protecting staff of the facility and reporting events immediately to competent bodies, including the initial assessment of the circumstances and consequences of the situation.

16.1.5 Programmes for gathering operational experience

Since 2008 and after several incidents/events at Spanish nuclear power plants in the years 2007 and 2008, the licensees adopted the commitment to carrying out a comprehensive analysis of the situation at each plant in order to identify possible improvements and strengthen the allocation of resources in the necessary areas, including analysis of the operational experience.

Additionally, as indicated in Section 9.1 on the licence to operate a spent nuclear fuel management facility, the nuclear power plants carry out procedural analysis of internal and external operational experience, which in some cases lead to improvement actions being taken that may affect the design or operational procedures. The documentation under analysis includes, but is not limited to:

- ✓ Experiences communicated by the competent bodies in the area:
  a) For nuclear plants of design originating in the US, the event reports (INPO Event Report (IER) issued by the INPO, (Institute for Nuclear Power Operations) or equivalent reports issued by the WANO (World Association of Nuclear Operators).
  b) For nuclear power plants of German design, notifications of operating experience (Weiterleitungsnachricht) issued by the Nuclear Safety Society (GRS).
- ✓ Recommendations written by the suppliers, including technical bulletins from suppliers (SAL, SR, RICS-IL, Technical Bulletin, etc.), as well as communications of deficiencies in safety equipment: all notifications pertaining to 10 CFR 21 of the US NRC for nuclear power plants of American design, along with the service and experience reports of the KWU for nuclear power plants of German design.

Finally, the licensees of nuclear power plants conduct continuous nuclear safety assessment of the facility, issuing periodic reports that must be issued to the CSN in accordance with the conditions of the License or Authorisation to operate. These periodic reports refer to various disciplines and include own and other operational experiences, which the CSN supervise periodically through bi-annual inspection and control of actions.

16.2 Management of radioactive waste at El Cabril

16.2.1 Authorisation to operate: limits and conditions operational experience

The nuclear storage facility for the disposal of solid radioactive waste at El Cabril obtained its provisional operating license by Ministerial Order in October 1992. The current operating authorisation, approved on 5 October is valid until the available volume for disposal in existing cells is completed. On the other hand, the Directorate General for Energy Policy and Mines' Res-

olution of 21 July 2008 authorised a modification in the design of the facility. There are 28 original disposal cells for disposal of low and intermediate level short-life radioactive waste (LILW) and four cells for very low level radioactive waste (VLLW), of which two are already in operation.

For the continuous assessment of safety of the El Cabril facility, ENRESA carries out the Periodic Safety Review regularly, every ten years. The first of these Reviews was presented in December 2003, corresponding to the operation period from 1992 to 2001. The second was presented in November 2012 covering the following ten years, the period from 2002 to 2011.

The scope and content of the Periodic Safety Review responds to that required in the Complementary Technical Instruction for the operating authorisation and includes the following thematic areas:

- ✓ Experience of operating a facility;
- ✓ Experience in the aspects of radiation protection;
- ✓ Experience relating to acceptance methodology and the quality of waste packages;
- ✓ Experience in the study of parameters that affect the long-term safety of the facility;
- ✓ Experience in the long-term safety assessment of the facility;
- ✓ Changes in regulation and legislation and
- ✓ Assessment programmes and facility improvements.

As indicated in greater detail in the previous reports, the operating authorisation was granted in accordance with the updated mandatory documents contained in the RINR, in place at that time (Safety Study, Operational Specifications, etc.) with added acceptance criteria for disposal units. The limits and conditions of nuclear safety and radiation protection establish that the operation of the facility will be carried out in accordance with the corresponding review of these documents.

The Operational Specifications describe the general conditions of the functioning of the El Cabril disposal facility. Part of these conditions constitute the limit values of certain parameters referring to the radiological capacity of the disposal facility, characteristics of the waste admissible at the facility for incorporation into disposal units, properties of these units and conditions imposed by discharges of effluents during the operational phases. Also included are:

- ✓ Actions to be taken in those circumstances in which some limit condition or value is not met.
- ✓ The conditions for operation and monitoring (reviews, checks, calibrations, etc.), to which systems, equipment and important safety and radiation protection components are subject.

Each of the individual treatment and conditioning activities are described in the Operational Instructions documents, which contain all the activities within the scope of the Instruction, initial condition and during operation of the system, the operational limits and requirements, actions to be taken in the event of anomalies and forms of action, of each of the systems of the facility, both related to waste management and auxiliary systems.

From the data obtained in the operational and maintenance experience, organisations involved in the design of the facility and in these activities maintain periodic meetings where the improvement plans are established. These activities are regulated in the "Procedure for Modifications to Design", in which each of the aspects involved in this process is set.

16.2.2. Procedures for the operation, maintenance, radiological monitoring, inspection and testing

The authorisation for operating of October 2001 for the El Cabril disposal facility takes into account that MINETAD may require the adoption of the pertinent corrective actions in light of the experience obtained in the operation of the facility, the results of other assessments and analysis in progress and the result of inspections and audits. In the period from 1 January of the year 2014 to 31 December of the year 2016, the CSN completed 33 inspections of the El Cabril disposal facility.

Moreover, this authorisation and that for the modification of the previously presented design, establish the duty to submit to the CSN in the first quarter of every calendar year, reports on, among other aspects, the following: modifications of design implemented or in the process of being implemented, results of the environmental radiological monitoring and dosimetric control of personnel, measures taken to analyse the applicability of new national nuclear safety and radiation protection requirements and regulation generated in this area in countries with disposal facilities with a similar design. In this last case, the aspects considered relevant are those related to tests and drills that contribute to improved knowledge of the long-term behaviour of radioactive waste.

With regard to the modifications made to design during the 2014-16 period, the following can be highlighted:

- ✓ Adoption of the Operating Technical Specifications of the facility for the entry into operation of Cell 30 for the disposal of VLLW which incorporates improvements to the design and operability from the operational experience of Cell 29.
- ✓ Launch of the closure project for Section I and the construction of Section II of Cell 29 for VLLW, to continue with the operation activities of the cell once the available volume on Section I has been filled to capacity.
- ✓ Development of the project for the remodelling of the Control Room of the Active Waste Quality Verification Laboratory at El Cabril, which assumes the technological upgrading of the monitoring and control systems and a remodelling of the physical space occupied.

16.2.3. Engineering services and technical support

According to the provisions of the RINR, the Operating Regulation contains information referring to the list of positions with nuclear responsibility, the organisation and functions of staff assigned to the facility, defining the basic education and training programmes.

In relation to the Fifth National Report, the appropriate modifications made during the period in this area pertain to the organisation of the operation based on the different organisational units of the Management of the facility, whose Director is currently under the auspices of the Technical Division of ENRESA, as reflected in the organisational chart included in Annex F of this Report. At the same time, from the headquarters and through the Departments of Safety and Licensing –belonging to the Technical Division-, of VLLW Engineering -of the Engineering Division-, and of Logistics -of the Operations Division-, general technical assistance to the facility is provided. Moreover the Engineering Project, contracted by the Department of VLLW Engineering, provides support for the completion and review of design and the technical validity of the modifications in accordance with the requirements established by the ENRESA Project Manager.

16.2.4. Characterisation and segregation of waste

ENRESA has an acceptance methodology for primary packages from nuclear facilities, the compliance with which forms part of the Operational Technical Specifications of El Cabril.

The first operating license for El Cabril, in October 1992, established that the acceptance criteria for waste at the facility, as an official operation document, had to be approved by the regulatory authorities. These criteria with small modifications over the course of this period, were in force until December 2004 and were applied to primary packages.

As indicated in previous National Reports, in December 2004 the regulatory authorities approved the modification of the design that allowed for the use of the CE-2a cask for the management of certain historic and non-compliant primary packages (non-compliance with quality objectives pertaining to mechanical resistance, confinement and thermal cycle resistance). This has allowed for:

- ✓ An increase in the activity limit per primary package.
- ✓ An increase in the limit acceptable dose rate per primary package.
- ✓ Optimisation of certain lines of conditioning of packages with panels.

Subsequently, ENRESA has been authorised to use other forms of disposal units, specifically proposed for the most efficient solution of operational issues, where they must be referred to in the authorisation for the fabrication and use of "cage" type disposal units for the site in primary package cells for singular characteristics within metallic structure of identical geometry as the aforementioned CE-2a cask and, more recently, the design and licensing of the CE-2b disposal unit specifically designed to better satisfy needs associated with the management of solid waste, principally metallic and heavy forms, generated from dismantling activities.

The management of waste at El Cabril allows the identification, monitoring and control of all waste packages at the facility and maintain up-to-date the inventory of the activity disposed in the cells in ways that can be contrasted at any time with the maximum radiological capacity (reference inventory).

ENRESA is authorised to carry out the necessary tests and drills on LILW destined for characterisation and acceptance. The controls of the acceptance are, principally, audits of process, controls or production along with technical verification drills, both destructive and non-destructive, which are mainly carried out in the laboratory at El Cabril. The drills have the following objectives:

- ✓ To compare the values of activity with those declared by the producer and monitor the factors of scale for difficult-to-measure radionuclides.
- ✓ To confirm compliance with the package properties associated with the methodology of generation.
- ✓ To check the important chemical aspects for safety of storage (compatibility of cask, corrosion, etc.).
- ✓ To examine the list of quality objectives for conditioned waste.

For its part, since October 2008, ENRESA has operated a specific facility at El Cabril for the very low level radioactive waste that might be defined as solid or solidified materials, for the most part chemically inert or previously stabilised, which are contaminated and/or activated and whose average level of radioactivity is below the authorised limits. As indicated previously[18] this waste forms part of the subset of low and medium level waste.

[18] *See Section B.2 Classification of radioactive waste*

16.2.5. Notification of incidents

The El Cabril facility has a regulatory Internal Emergency Plan. Emergency situations are classified across three categories, none of which foresee the release of radioactive material in quantities which would require protection measures beyond the site. Therefore, no emergency above the level of site emergency is defined.

In addition to the organisation in normal conditions, the Internal Emergency Plan collects the activities and the organisation for the operation of the facility in emergency situations that require special actions. The basis of the organisation of the emergency is the organisation of the site itself, although the necessary mechanisms have been established to guarantee the location of these persons at all times in accordance with internal procedure. In all cases, communication with the CSN is planned.

Also, El Cabril, like all the other nuclear facilities, is subject to the reporting of events according to the applicable legislation.

16.2.6 Programmes for gathering operational experience

To gather the operational experience for El Cabril, periodic meetings are held where the organisations involved in the design of the facility and the operation and maintenance activities establish the improvement plans.

This activity feeds off the data obtained in the operational and maintenance experience. Thus, ENRESA participates regularly in different international forums for the purpose of obtaining operational experience at other facilities of similar design.

The implementation of improvements and modifications is regulated by the "Procedure of modification of design" in which each of the aspects involved in this process is set.

16.2.7 Closure plans

The technical aspects for the future closure and decommissioning of El Cabril have been developed in Articles 14.3 and 17.2.

As indicated in 16.2.1, the operating license awarded to the El Cabril facility by the Ministerial Order of 5 October 2001 covers its operations until full capacity is reached for the 28 existing LILW cells. As of 31/12/2016, the facility had reached 74% of total capacity.

In relation to the estimated closure date, successive reviews of the GRWP have updated estimates in relation to the use of the remaining existing capacity which is expected to be conditioned by technical and technological factors associated with the quantities and characteristics of the waste generated and also by external factors, principally the decisions made in relation to the operating life of nuclear power plants and their dismantling.

Article 17
Institutional Measures After Closure

Article 17. Institutional Measures After Closure

Each Contracting Party shall take the appropriate steps to ensure that after closure of a disposal facility:

i) records of the location, design and inventory of that facility required by the regulatory body are preserved

ii) active or passive institutional controls such as monitoring or access restrictions are carried out, if required; and

iii) if, during any period of active institutional control, an unplanned release of radioactive materials into the environment is detected, intervention measures are implemented, if necessary.

According to Article 4.4 of Royal Decree 102/2014 of 21 February, for the responsible and safe management of spent nuclear fuel and radioactive waste, the State becomes the licensee of spent fuel and radioactive waste once it has been placed in disposal. Moreover, the State shall assume responsibility for surveillance of the disposal facilities after closure.

Thus, in accordance with the provisions of Article 38-bis of Law 25/1964, of 25 April, the Nuclear Energy Act, the management of radioactive waste, including spent nuclear fuel, is considered an essential public service which is reserved for the State, the management of which is assigned to ENRESA in accordance with the General Radioactive Waste Plan approved by the Government.

17.1. Custody of documents

ENRESA, as licensee of the facilities according Royal Decree 10/2014, is responsible for the permanent maintenance of the archive of the inventory of waste deposited at the storage or radioactive waste disposal facilities. Article 9.3 e) specifies, among the functions assigned to ENRESA, the preparation and management of the National Inventory of Spent Nuclear Fuel and Radioactive Waste. This Inventory shall include spent nuclear fuel and radioactive waste disposed of after the closure of the facility in which they are placed in disposal.

17.2. Closure of radioactive waste disposal facilities

Royal Decree 102/2014 modified Royal Decree 1836/1999 on the Regulation of nuclear and radioactive facilities and includes in Article 12 the need for an authorisation for the dismantling and closure of disposal facilities for spent nuclear fuel and radioactive waste (Article 12-g).

The dismantling process of disposal facilities will end with a declaration of closure which will ultimately allow for the delimiting of areas that must, where necessary, be subject to subsequent control and radiological or other form of monitoring for a determined period of time, and the cessation of control over the remaining areas.

In Spain, all facilities where deposits of radioactive waste have been stabilised and conditioned on-site belong to the first part of the nuclear fuel cycle (sterile material from mining and sterile material from old manufacturing processes of uranium concentrates). The current situation regarding these facilities is no different from that reported in the previous National Report.

17.3. Institutional controls and future forecasts

According to Royal Decree 102/2014, the dismantling or closure process of a facility for the disposal of spent nuclear fuel and radioactive waste ends with a declaration of closure. Said declaration must delimit the areas which, after closure, must be subject to control and radiological or any other monitoring form for the time and period of said control.

Thus, once approved, the Seventh GRWP must consider, in accordance with the provisions of said Royal Decree, the concepts or plans for the period after the operational phase of a disposal

facility, indicating the estimated period of time during which the pertinent controls must be maintained, along with the resources which must be used to preserve the knowledge of said facility long-term.

17.4. Forecasts regarding possible remediation interventions

Possible remediation interventions at spent nuclear fuel and radioactive waste disposal facilities must be provided for in the granted closure declarations. For reasons expressed above, it seems foreseeable that the practical application of said measures or actions are assigned in the closure declarations for entities or organisations responsible for the long-term control of said disposal facilities.

This page blank

Section I

Transboundary movement

Section I. Transboundary movements

Article 27
Transboundary movement

Article 27. Transboundary movement

1. *Each Contracting Party involved in transboundary movement shall take the appropriate steps to ensure that such movement is undertaken in a manner consistent with the provisions of this Convention and relevant binding international instruments. In so doing:*

   i) *a Contracting Party which is a State of origin shall take the appropriate steps to ensure that transboundary movement is authorized and takes place only with the prior notification and consent of the State of destination;*

   ii) *transboundary movement through States of transit shall be subject to those international obligations which are relevant to the particular modes of transport utilized;*

   iii) *a Contracting Party which is a State of destination shall consent to a transboundary movement only if it has the administrative and technical capacity, as well as the regulatory structure, needed to manage the spent fuel or the radioactive waste in a manner consistent with this Convention;*

   iv) *a Contracting Party which is a State of origin shall authorize a transboundary movement only if it can satisfy itself in accordance with the consent of the State of destination that the requirements of subparagraph (iii) are met prior to transboundary movement;*

   v) *a Contracting Party which is a State of origin shall take the appropriate steps to permit re-entry into its territory, if a transboundary movement is not or cannot be completed in conformity with this Article, unless an alternative safe arrangement can be made.*

2. *A Contracting Party shall not licence the shipment of its spent fuel or radioactive waste to a destination south of latitude 60 degrees South for storage or disposal.*

3. *Nothing in this Convention prejudices or affects:*

   i) *the exercise, by ships and aircraft of all States, of maritime, river and air navigation rights and freedoms, as provided for in international law;*

ii) rights of a Contracting Party to which radioactive waste is exported for processing to return, or provide for the return of, the radioactive waste and other products after treatment to the State of origin;

iii) the right of a Contracting Party to export its spent fuel for reprocessing;

iv) rights of a Contracting Party to which spent fuel is exported for reprocessing to return, or provide for the return of, radioactive waste and other products resulting from reprocessing operations to the State of origin.

27.1. Regulatory development

As has been described in previous National Reports, Council Directive 2006/117/Euratom, of 20 November 2006, established the community regime for monitoring and control of transboundary transfers of radioactive waste and spent fuel. This Directive was transposed into domestic legislation via Royal Decree 243/2009, of 27 February, regulating the monitoring and control of movements of radioactive waste and spent nuclear fuel across Member States or with an origin or destination outside the EU.

Thus, Royal Decree establishes the standard document, defined in the Commission Decision 2008/312/Euratom, of 5 March, which must comply with a transfer request.

Royal Decree 243/2009 shall not apply to shipments of disused sources to a supplier or manufacturer of radioactive sources or to a recognised facility, shipments of radioactive materials recovered from reprocessing to be used and transboundary shipments of waste that contains only naturally occurring radioactive material which does not arise from practices, in accordance with the definition provided in Royal Decree 783/2001, of 6 July.

The authorisations covered in this Royal Decree should not replace any specific national requirements for the shipments such as transport licences, physical protection, civil protection, etc. Royal Decree 243/2009 was partially amended by the second final provisions of Royal Decree 10/2014, of 21 February for the responsible and safe management of spent nuclear fuel and radioactive waste.

On the other hand, Royal Decree 102/2014 establishes that radioactive waste generated in Spain shall be disposed of in this country, except in the case where, at the time of shipment, an agreement has entered into force between the Spanish State and another Member State or third country, that takes into account the criteria established by the Commission in accordance with Section 2 of Article 16 of Directive 2006/117/Euratom, the objective of which is the installation of a disposal facility in one of those. This requirement shall not apply to the repatriation of disused sealed sources that are shipped to a supplier or manufacturer and the transfer of spent nuclear fuel from research reactors to a country that supplies or manufactures research reactor fuel, taking into account applicable international agreements.

In the event, before final transfer for disposal of radioactive waste to a country that is not a Member State of the European Union, the natural or legal person responsible for same shall report this fact to the Directorate General of Energy Policy and Mines of MINETAD, for the purpose of informing the European Commission of the content of said agreement and adopting the reasonable measures to ensure that:

a) the destination country has an agreement in place with the European Atomic Energy Community that covers that management of spent nuclear fuel or radioactive waste or is a Party to the Joint Convention on safety of spent nuclear fuel management and safety in the management of radioactive waste.

b) the destination country has programmes in place for the disposal of radioactive waste with high level safety objectives and equivalent to those established in Directive 2011/70/Euratom, establishing a Community framework for the responsible and safe management of spent fuel and radioactive waste.

c) the destination country's disposal facility has been authorised to receive radioactive waste, it is in operation before the shipment is sent and is managed in accordance with the established requirements of the management programme and the disposal of radioactive waste in said destination country.

On the other hand, as reflected in previous Reports, Spain has included in its internal legislation the updates and amendments in the international arena that refer to the transport of goods by air, sea, rail and road, and specifically, those pertaining to:

- ✓ European Agreement concerning the International Carriage of Dangerous Goods by Road (ADR) (published in the Official State Gazette (BOE) of 7 December 2015). Since 1 January 2017, the new version (ADR 2017) still not published in the Official State Gazette, has been in force, although transport that complies with ADR 2015 is still permitted until 30 June 2015.
- ✓ Royal Decree 97/2014, of 14 February, regulating transport operations of dangerous goods by road in the national territory, repealing Royal Decree 551/2006, of 5 May 2006, regulated the operations for the transport of dangerous goods by road in the Spanish territory.
- ✓ Regulation pertaining to the International Transport of Dangerous Goods by Rail (RID) 2015. The amendments contained in this edition of the RID were published in the Official State Gazette (BOE) on 23 February 2015 with the correction of errors in the BOE of 31 July 2015. The RID 2017 has entered into force on 1 January 2017 and will be mandatory from 1 July. During the first six months of 2017, transport may comply with RID 2015.
- ✓ 2012 amendments to the International Maritime Dangerous Goods Code (Code IMDG) published in the BOE on 29 September 2015.
- ✓ Technical Instructions for the Safe Transport of Dangerous Goods by Air 2015 (Documentation OACI 9284/AN/905), published by the BOE on 10 April 2015.

27.2. Experience in Spain

Since June 2014, the following files have been issued in relation to transboundary shipments within the scope of application of Directive 2006/117/Euratom:

- ✓ 2014. Shipment of irradiated fuel rods from a nuclear power plant in Spain to the research facilities at Studsvik (Sweden), within the framework of the R&D plan.
- ✓ 2015. Shipment from France to a nuclear power plant of radioactive waste arising from the decontamination of primary pump motors.

This page blank

Section J

Disused Sealed Sources

Section J. Disused Sealed Sources

Article 28. Disused Sealed Sources

Article 28. Disused Sealed Sources

1. *Each Contracting Party shall, in the framework of its national law, take the appropriate steps to ensure that the possession, re-manufacturing or disposal of disused sealed sources takes place in a safe manner.*
2. *A Contracting Party shall allow for re-entry into its territory of disused sealed sources if, in the framework of its national law, it has accepted that they be returned to a manufacturer qualified to receive and possess the disused sealed sources.*

28.1. Measures to ensure safe possession, re-preparation and disposal

Law 25/1964, the Nuclear Energy Act, establishes in its Article 31 that radioactive materials cannot be used or stored within the national territory by persons not expressly authorised to do so, and it indicates that the same requirements shall be applied to transfer or resale.

This legal requirement is developed in the RINR. The regulation's Article 36 establishes that radioactive facilities for scientific, medical, agricultural, commercial or industrial purposes require an authorisation for operation, a declaration of closure and, where applicable, an authorisation for modification or change of licensee.

In Article 34 of the aforementioned regulation, it is established that these are facilities of any kind that contain an ionising radiation source, along with any premises, laboratories, factories or facilities that produce, use, possess, treat, manipulate or store radioactive materials.

These requirements are applicable independently of whether or not the radioactive materials are new or spent or disused.

Therefore, the possession and re-preparation of any source of radioactive material in Spain requires an administrative authorisation. In the licensing process that the licensee must follow to obtain this authorisation, it is necessary that the CSN issue a mandatory report on the safety and radiation protection, after verifying that the licensee will carry out all operations fulfilling the applicable safety and radiation protection requirements. The corresponding authorisations, issued by the competent bodies, are accompanied by the applicable limits and conditions.

Among the documentation that the licensees must present to obtain these authorisations is a document on planning for the decommissioning of the facility, in which information must be provided on the provisions for the management of the disused sources is safe conditions, including the economic provisions made for same.

The CSN, in the exercise of its inspection and control functions at authorised facilities, where it finds disused radioactive sources or equipment, obliges licensees to remove them, following the steps provided in the regulations and supervises the execution of these activities.

In the year 2014, the CSN established a Protocol that grouped, in a systematic manner, all the resources and tools available to the CSN and Spanish regulation in order to detect the entities with problems in terms of viability, whether due to economic problems or any other issues, to establish the risk of each situation and act in time.

Prior to the year 2013, the CSN issued an instruction to all licensees of sealed radioactive sources to require actions from those with problems pertaining to viability and, in the case of being incapable of maintaining adequate control of the sources, the requirement to transfer the same to a reliable entity: another authorised licensee, the supplier or the National Radioactive Waste Management Agency (ENRESA).

The protocol was applied in a pilot phase during the year 2015 and was formally implemented in the year 2016.

In terms of the final provision of disuses sources of radiation, the provisions adopted in Spain are diverse in terms of the different situations that might arise.

Where it concerns sources of radiation for which the licensee has obtained an authorisation as a radioactive facility, there is a duty on the licensee to return disused radioactive sources to the supplier of same, or in their absence, their management through the National Radioactive Waste Management Agency (ENRESA).

In Spain, there are no facilities for the manufacture or production of sealed radioactive sources, therefore all sources are imported from other countries. Article 74 of the RINR shows that the import, export and intra-community movement of radioactive material must be done in compliance with international commitments assumed by Spain in this area. In the event that sources originate from a Member State of the European Union, a communication regime of the shipments of sources to the authorities of the recipient country and for acceptance on the part of same shall apply, established in Regulation 1493/1993/Euratom. In the case of sources with an origin or destination outside the European Union, the Code of Conduct on the Safety and Security of Radioactive Sources and, more specifically, the Supplementary Guide on the Importation and Export of Radioactive Sources is applied. This guide envisages a regime of prior permission from the Regulatory Authority of the importing country for the shipment of any Category 1 source, and communication prior to the effective shipment date. For Category 2 sources, only prior communication of the effective shipment date is required. In Spain the CSN has been designated as a point of contact for communications arising from the application of this guide.

Where the entity which is to perform the importation of radioactive sources has an authorisation as a radioactive facility, this also entitles it to import radioactive sources (single authorisation). CSN Instruction IS-28, of 22 September 2010, on the technical specifications that second and third-category radioactive facilities must observe, establishes the obligation of all entities that carry out importation activities from other countries establish agreements with foreign suppliers for the return of same to their country of origin at the end of their useful life. In fact, Instruction IS-28 imposes on all radioactive facilities the requirement to establish with the supplier of each radioactive source an agreement for its removal when it is in disuse.

There exist situations in which the licensee of an authorisation for the possession and use of radioactive sources cannot return it to the supplier at the end of their useful life (for example,

where the supplier has ceased activities). In these cases, the limits and conditions establish that the licensee must approach ENRESA in order to proceed with its removal and management as radioactive waste. In this case it is ENRESA who, based on the regulations governing their activity, is responsible for the management of radioactive sources and a final destination for same in accordance with the applicable legislation, depositing them in the low and intermediate level waste disposal facility which it has authorised at Sierra Albarrana (El Cabril) or adopting the appropriate measures for disposal.

Where dealing with disused sources of radioactive waste outside the system of regulatory control (old sources or orphan sources), that is to say that there is no authorised licensee, the two possibilities mentioned shall be considered. If it is possible to identify the supplier of sources, the person in possession of it performs the necessary steps to proceed with its removal; in the event that this is not feasible, the owner of the source shall establish contact with ENRESA. In accordance with the provisions of Article 74 of the RINR, the removal by ENRESA of authorised disused sources requires a specific transfer issued by MINETAD, subject to a prior report by the CSN.

A special case within the set of orphan sources is that of those detected at facilities for the processing or recovery of scrap metal. Steps for the safe management of these are provided in the Protocol agreed between the companies in the sector, MINETAD, the CSN, ENRESA and Trade Union organisations. Said protocol establishes the obligation of the licensee of the industry in which the source is detected to establish technical and administrative systems to isolate the source, identify the radioactive isotope and its activity and maintain it safely until it can be removed. In this protocol it is established that when the radioactive source is of domestic origin it shall be managed as radioactive waste by ENRESA, who shall assume the costs. In other cases, the sources shall be returned to the scrap metal supplier, and if this is not feasible they shall be transferred to ENRESA for management as radioactive waste in which case the costs arising shall be borne by the companies, without prejudice to case where these may impact the supplier or shipper of the scrap.

Another special case is that of the provisions of Ra-226 needles for medical use, which were used in Spain prior to the development of the regulation of authorisation for the possession and use of radioactive sources and materials. These sources ceased to be used many years ago and have been subject to specific campaign for the recovery, removal and management on the part of ENRESA. The costs of this management have been supported with a charge to the fund of ENRESA and no cost to the owners. At this time, the campaign for collection and removal is considered to be complete, after several years without the appearance of any new sources.

With the possession, use, transfer and disposal of radioactive sources in safe condition in all cases mentioned in the above paragraphs, it is guaranteed that the different entities that participated in these processes are obliged to comply with the provisions of the Regulation on health protection against ionising radiation. This Spanish standard includes requirements on radiation protection and safety of radioactive sources, the International Atomic Energy Agency (IAEA), and EU Directive 96/29/Euratom.

In December 2003 the European Union approved Directive 122/2003/Euratom on the control of high-activity sealed radioactive sources and orphan sources. This Directive, repealed by Directive 2013/59/Euratom, was transposed into Spanish domestic legislation through Royal Decree 229/2006, of 24 February, on the control of sealed high level radioactive sources and orphan sources. It includes specific requirements relating to the control of sources and the management of disused sources. Article 5 of said Royal Decree states that before completing the preliminary authorisation prior to the start-up of the radioactive facility for which authorisation includes a source, the owner must arrange with the supplier the appropriate agreements for their return when it becomes disused and establish the financial guarantee to provide for its safe man-

agement at that time, even in the case of insolvency, cessation of activities or any other contingency that may occur.

Article 7 of same establishes the obligation of owners of radioactive sources to keep an inventory sheet for each of the sources under their responsibility, where their location and transfers are recorded, issuing a copy of same to the CSN and MINETAD. A copy of this sheet must specifically be sent in the case of any change in the location or the regular storage of the source; also the identification of a new owner must be communicated immediately or the recognised facility to which it has been transferred when the inventory sheet of a specific source is closed.

As an additional measure, this Article requires the CSN to keep an up-to-date inventory of State ambit of the authorised owners for the sources they possess. For this purpose, the virtual office of the CSN offers an application in which the owners of facilities can upload the high level sources inventory sheets, which make the work of reporting data easier and allows the CSN to use this data for counts, statistics, etc.

Article 8 goes on to require that the owner return all disused sources to the supplier, for which the appropriate agreements must be reached in advance or be transferred to another authorised owner or a recognised facility, without unjustified delay once it has ceased to be used.

Finally, this new regulation includes requirements pertaining to the identification and marking of sources, training of personnel, surveillance measures to detect the appearance of orphan sources and for subsequent management, including the establishment of a financial guarantee to cover the costs arising from this.

In April 2004, Spain communicated to the Director General of the IAEA its commitment to the application of the Code of Conduct on the Safety and Security of Radioactive Source, which represents a strengthening of measures to maintain efficient control of the sources of radiation from manufacture to disposal at an authorised facility. These measures are found in the national regulation relating to security, protection, radiation, radioactive waste management, transport and control of radioactive sources.

As indicated, Spain is applying the same guidelines on the import and export of radioactive sources published by the IAEA as a development of the aforementioned Code of Conduct and has designated a national point of contact for the exchange of consent requests for transfers of sources and the notification shipments of same. In this sense, Spain has begun the procedure to notify the IAEA of its support for said Code and to demonstrate its intention to continue to act in accordance with the guidance contained in same.

It is also worth highlighting that, by virtue of Royal Decree 1308/2011 on the Physical Protection of Nuclear Facilities and Materials and Radiation Sources, a physical protection regime has been established that:

- ✓ provides protection against robbery, theft or other illicit appropriation of nuclear materials or radioactive sources during their use, storage or transport,
- ✓ guarantees the application of sufficient appropriate measures to locate and, where appropriate, recover nuclear material or radioactive sources lost or stolen,
- ✓ protects against sabotage or any other legal action that might have radiological consequences or prejudice or alter the normal operation of facilities, and
- ✓ mitigates the radiological consequences of sabotage.

In relation to radioactive sources, said Royal Decree establishes a classification, based on the activity and danger level of a series of radionuclides and, for those that reach a certain category, imposes a series of requirements; basically that those who use them must have permission, granted by MINETAD subject to favourable prior report from the CSN and the Ministry of the Interior. This permission is based on checks that the requester has an appropriate system of

physical security, both in terms of material and organisation and protocols of operation and custody of radioactive materials.

Finally, the Nuclear Safety Council issues CSN Instruction IS-41, of 26 July of 2016, by which the requirements on physical protection of radioactive sources are approved. This Instruction develops the requirement of the aforementioned Royal Decree 1308/2011, aligns Spanish regulation with the Nuclear Security Series No. 11 Security of Radioactive Sources of the IAEA. This establishes the basic functions of the system of physical protection of radioactive sources (dissuasion, detection, delay and response), the organisation and management of safety and the content of the physical protection plan, an official document that describes the system and which must be developed by each facility and submitted to the approval of the executive granting the authorisation for operation.

28.2. Readmission to Spanish territory of sealed disused sources

As has been mentioned, in Spain at present there are no facilities for the manufacture or production of sealed radioactive sources. Nevertheless, in the Spanish regulation, there is no disposition that impedes the readmission of radioactive sources exported by Spanish manufacturers.

The authorisation of Spanish license holders to import radioactive sources from other countries requires that these comply with the provisions of this article, allowing the return of sources out of use to suppliers or manufacturers authorised in their national territory.

This page blank

Section K

General Efforts to Improve Safety

Section K. General Efforts to Improve Safety

K1. Measures adopted in relation to challenges and suggestions identified at the fifth review meeting of the Joint Convention

During the period covered by this Report, Spain has continued working on those challenges and suggestions that were identified in at the fifth review meeting of the Convention (licensing of a Centralised Temporary Storage, developing the regulation pertaining to the clearance of waste material and finalising of the national waste inventory) as has already been summarised under section A.3.

K2. Possible areas of improvement and activities planned to improve safety

This Sixth National Report presents the situation in Spain in relation to the management of spent nuclear fuel and radioactive waste in the context of safety requirements established in the Joint Convention. Looking at the information provided in the treatment of each article and the evaluation of compliance, it can be stated that, in general terms, the Spanish system complies with the requirements of the Convention.

Nevertheless, taking into account the nature of the safe management of radioactive waste and spent fuel, work is ongoing on the improvement of the legal and regulatory framework, and in areas listed below and in those expected to obtain improvements in the short and medium term:

K2.1. Regulatory development in relation to safety in the management of spent fuel and radioactive waste

As has been pointed out throughout this Report, the aspects in which work remains ongoing in order to complete the legal and regulatory framework for the long-term management of spent fuel and nuclear waste are:

- ✓ Transposition into domestic legislation of Council Directive 2013/59/Euratom of 5 December 2013 laying down basic safety standards for protection against the dangers arising from exposure to ionising radiation.
- ✓ Transposition of Council Directive 2014/87/Euratom, of 8 July 2014, amending Directive 2009/71/Euratom, establishing a Community framework for the nuclear safety of nuclear installations.

K2.2. Licensing and construction of a Centralised Temporary Storage (CTS)

As indicated in Article 6.1 of this Report, the basic strategy for the management of spent fuel generated by Spanish nuclear power plants, along with radioactive waste which, due to its characteristics, cannot be managed at El Cabril, consists of the temporary storage at a Centralised Temporary Storage which will be located in the municipality of Villar de Cañas until a final disposal facility is available.

With regard to sectoral legislation, in January 2014, ENRESA presented to MINETAD simultaneously the site and the construction authorisations required by the RINR for these types of facilities. The site authorisation, which is the official recognition of the objective of the facility and the suitability of the chosen site, shall entitle ENRESA to begin work on the authorised preliminary infrastructure; and the construction authorisation shall allow for the construction of the nuclear facility. The site authorisation has already been favourably reported by the CSN through the report of 27 July 2015, with the authorisation for construction still being assessed by the CSN, after which MINETAD shall resolve the requests of ENRESA.

After the granting of these two authorisations for the purpose of initiating the operation of the facility, the RINR requires an authorisation for operation, which is granted by MINETAD, subject to a mandatory and binding report of the CSN. Nevertheless, the start-up of a cask storage facility is envisaged as part of the CTS, which would allow for compliance with the temporary storage needs for spent fuel and waste before the main facility becomes operational.

Also, as part of the authorisation process, in August of the year 2013 the process began for the environmental impact assessment of the CTS project, required by Royal Legislative Decree 1/2008, of 11 January (in force at that time and since repealed by Law 21/2013 on environmental assessment). Both the preliminary authorisation and the Environmental Impact Assessment were subject to the public information process, in accordance with the regulation, simultaneously, and currently awaiting the Environmental Impact Declaration, the issuing of which corresponds to the Ministry of Agriculture and Fisheries, Food and the Environment.

K2.3. The approval of the Seventh General Radioactive Waste Plan (GRWP)

Although the Sixth General Radioactive Waste plan already contains strategies and actions to carry out in Spain in different areas of radioactive waste management and the dismantling of facilities, and the corresponding economic-financial provisions to achieve them, the need to update said provisions and the actions pertaining to the CTS and to adapt to the requirements of the new Directive 2011/70/Euratom makes it necessary for the Government to adopt a Seventh Plan. In any case, the period in which the Spanish Government has been in place as an acting government and the delays involved for the licensing of the CTS have postponed the beginning of the procedure for its adoption, which is foreseen to take place in the coming months.

K2.4. Implementation of the policy on the safety culture in the regulatory body

As a continuation of the process initiated by the CSN in relation to the strengthening of the safety culture within this body and once the policy document mentioned in section A.3 point g) of this Report is approved, the CSN has established a step by step action plan in which a series of landmarks are established to be carried out. Highlighted in this plan is the completion of a self-assessment on the safety culture. It is envisaged that the Plenary of the CSN will decide, at the end of 2017, on the mechanism by which this self-assessment shall be carried out, based on the different alternatives being analysed by the multidisciplinary working group responsible for this process.

K3. Information on strengths of the regulatory system in Spain in the area of the Joint Convention

Spain remains committed to continued improvement in the ambit of safe management of spent fuel and radioactive waste. Below are some of the most significant measures in progress in the ambit of the Convention in this period:

- ✓ Application in the design phase of the CTS of the most recent regulatory developments, such as Directive 2014/87, anticipating the compliance requirement through a CSN Technical Instruction (IT). Said Technical Instruction required the identification of potential improvements in the design of the facility (beyond the basis of the design) with regard to serious conditions, both extreme natural events and those of human origin, analysis of the safety functions in the event of multiple faults and management of the emergency response for these situations. This involves the strengthening of the design of the facility along the lines of work carried out at nuclear power plants to comply with post-Fukushima regulations and the loss of large areas.
- ✓ Application in the design phase of the CTS of physical safety requirements through a Complementary Technical Instruction (ITC). Once the Design Basis Threat is prepared at State level, the promoter is required to analyse the possible sabotage scenarios and take the necessary measures for the physical protection limiting the radiological consequences. Thus, in the preparation of said ITC, the principles of achieving nuclear safety and security have been integrated.
- ✓ Incorporation of aspects of engineering and human factors in the design phase of the CTS for the purpose of rescuing both human errors and the impact of these on the operation of installation systems. These aspects cover the entire life cycle of the facility, from design to dismantling and will have greater development during the construction, installation and assembly phase.
- ✓ Improvements in the training and licensing programmes of operative personnel at the CTS. Through a Technical Instruction, in an early phase of the development the promoter is required to carry out the analysis of tasks and the definition of the training needs of personnel requiring licenses.
- ✓ Implementation of improvements to the safety of the Individualised Temporary Storages of the nuclear power plants to tackle situations beyond the design basis, including the loss of large areas.

- ✓ With respect to the safety culture, without prejudice to the necessary supervision of the safety culture programmes of the licensees of nuclear and radioactive facilities, activities oriented towards the strengthening of the safety culture have also been carried out at the regulatory body. Thus, in 2017, the Nuclear Safety Council approved the document "CSN Policy on the Safety Culture". Work has also been carried out on the preparation of an action plan to develop the CSN policy in this area and which considers different short and medium-term activities to be carried out.
- ✓ Taking into account the needs for generational replacement, especially in terms of experts at the regulatory body, the priority objectives of the Nuclear Safety Council are the replenishment of human resources and the establishment of a knowledge management model. In doing so, in recent years it has been able to fill vacancies caused by retirements with new recruits and put in place a project for the extraction and transfer of knowledge, which will serve as the base for the consolidation of a broader knowledge management model.

K4. Plans and calendar of peer review missions or monitoring missions and measures taken by Spain to make the results of reports public

During the period covered by this Report, in April 2005, the second workshop for peer review of post-Fukushima national action plans (NAcP) was held. The process of review, organised in the framework of ENSREG, was based on national reports published in December 2014[19]. Thus the workshop allowed for specific technical aspects to be discussed in relation to the application of safety improvements in light of the lessons learned from the Fukishima accident. Both the terms of reference for the review process and the workshop itself which concluded the same were led by the CSN's Director of Nuclear Safety, who exercises the presidency of the Nuclear Safety Working Group since January 2014.

Spain, as an EU Member State, must carry out periodic self-assessments of the national framework and regulatory authorities in the area of the nuclear safety of its nuclear facilities at least every ten years, which is followed by an international peer review for the purpose of the continuous improvement of nuclear safety. In addition, self-assessments of national frameworks in the area of radioactive waste management and spent fuel management, the regulatory authorities and national programmes must also be carried out every ten years, followed by the corresponding peer review. The results of both missions must be communicated to the European Commission and other Member States as soon as they are available and shall be published and made available to the public on the websites of the CSN, ENRESA and MINETAD and also on the website of ENSREG and the IAEA.

As a result of this commitment, Spain has requested from the IAEA a joint IRRS (Integrated Regulatory Review Service) + ARTEMIS (Integrated Review Service for RW and SF management, decommissioning and remediation programmes) mission to be carried out in October 2018, ten years after the IRRS mission which took place in Spain in the year 2008[20], and preparatory work and self-assessment for this mission is already underway.

[19] *http://www.ensreg.eu/EU-Stress-Tests/Country-Specific-Reports/EU-Member-States/Spain*

[20] *Spain received an IRRS (Integrated Regulatory Review Service) mission in the year 2008 and the follow-up mission in 2011.*

During the period covered by this Report, there have been a number of WANO (World Association of Nuclear Operators) technical support missions, operator-level peer review missions at Almaraz (December 2014), Ascó (June 2015), Cofrentes (May 2014) and Vandellós II (September 2014), and a number of monitoring missions at Almaraz (January 2017), Cofrentes (May 2016), Trillo (October 2015), and Vandellós II (April 2016).

K5. Information on the improvement of the openness and transparency in the implementation of the obligations of the Convention

With the aim of achieving greater transparency and openness to the public in the implementation of the obligations of the Joint Convention, the Ministry of Energy, Tourism and Digital Agenda has published all National Reports on its website in accordance with Article 32 of the Convention, and the questions and comments received in the review process of same. The National Report is also accessible to the public through the websites of the CSN and the IAEA. In addition, both the National Report and the Reports of the rapporteurs to the Plenary and the summary report of the review meetings are issued to the respective Commissions of Energy, Tourism and Digital Agenda of the Congress of Deputies and the Senate.

This page blank

Section L

Annexes

Section L. Annexes

Annex A

Domestic legislation in the ambit of nuclear energy and radioactive waste

1. Standards of legal scope

- ✓ Nuclear Energy Act (Law 25/1964 of 29 April; LEN; BOE 04.05.1964). This law has been amended by:
  - Law 25/1968, of 20 June, amending by Articles 9 and 16 of Law 25/1964.
  - Law 15/1980, of 22 April, creating the Nuclear Safety Council.
  - Law 54/1997, of 27 November, on the electrical sector (Articles. 2.9).
  - Law 62/2003, of 30 December on fiscal, administrative and social order measures (addition Article. 2.12.bis and first additional provision).
  - Law 24/2005, of 18 November, on reforms to promote productivity (Articles 28-30, 84).
  - Law 33/2007, of 7 November reforming Law 15/1980 (Articles. 1, 2.12bis, 36-38 43, 44 bis and chapter XIV).
  - Law 11/2009, of 26 October, regulating Listed Investment Companies on the Property Market. (Article 38 bis).
  - Law 12/2011, of 27 of May, on civil liability for nuclear damage or damage caused by radioactive materials (Articles 2 and 28) (repealing Chapter VII (except Article 45), and chapters VIII, IX and X once it has entered into force).
- ✓ Law creating the Nuclear Safety Council (Law 15/1980 of 22 April; BOE 25.04.1980). This law has been amended by:
  - Law 34/1998, of 7 October, on the hydrocarbons sector.
  - Law 14/1999, de 4 of May, on fees and prices charged to the public for services rendered by the CSN.
  - Law 62/2003, of 30 December on fiscal, administrative and social order measures.
  - Law 24/2005, of 18 November to promote productivity.
  - Law 33/2007, of 7 November, reforming Law 15/1980.
- ✓ Law on fees and prices for services rendered by the Nuclear Safety Council (Law 14/1999, of 4 May; BOE 05.05.1999). Amended by:
  - Law 30/2005, of 29 December, on the General State Budgets for the year 2006 (BOE 30.12.2005).
- ✓ Law on the electrical sector (Law 54/1997, of 27 November; BOE 28.11.1997 and 31.12.2001). This law has been amended, with regard to nuclear energy by:
  - Law 24/2005, of 18 November, on reforms to promote productivity (seventh additional provision).

- Law 11/2009, of 26 October, regulating Listed Investment Companies on the Property Market (sixth additional provision and repeal of the sixth additional provision bis).
- Law 2/2011, of 4 March, on the Sustainable economy modifying section 9 four of the sixth additional provision of Law 54/1997 regulating the rate for the provision of radioactive waste management services for waste generated at radioactive and other facilities.
- Law 24/2013 of 26 December, on the Electricity Sector, repealing Law 54/1997 except the sixth and seventh additional provisions (BOE 27.12.2013).

✓ Law 21/2013, of 9 December, on environmental assessment (BOE 11.12.2013).

✓ Law 27/2006 (Aarhus Law), of 18 July, regulating the rights of access to information, public participation and access to justice in the area of the environment (BOE 19.07.2006). This law has been amended by:

- Royal Legislative Decree 1/2008, of 11 January, approving the consolidated text of the Law on Environmental Impact Assessment of projects.

✓ Law 12/2006, of 27 December on the complementary taxation of the Budget of the Autonomous Community of Andalusia (BOE 16.01.2007).

✓ Law 12/2011, of 27 of May, on civil liability for nuclear damage (BOE 28.05.2011). Not yet in effect.

✓ Law 15/2012, of 27 December, on fiscal measures for energy sustainability (BOE 28.12.2012), amended by:

- Law 16/2013, of 29 October establishing specific measures in relation to environmental taxation and adopting other tax and financial measures (BOE 30.10.2013).

2. Standards of regulatory scope

1. Nuclear and Radioactive Facility Regulation (Royal Decree 1836/1999, of 3 December BOE 31.12.1999). This Law was amended by:
   - Royal Decree 35/2008, de 18 January, modifying the Regulation of nuclear and radioactive facilities.
   - Royal Decree 1308/2011, of 26 September, on the physical protection of nuclear facilities and materials, and radioactive sources (BOE 07.10.2011).
   - Royal Decree 102/2014, of 21 February, for the responsible and safe management of spent nuclear fuel and radioactive waste.
2. Regulation on health protection against ionising radiation. (Royal Decree 783/2001, of 6 July BOE 26.06.2001). This law has been amended by:
   - Royal Decree 1439/2010, of 5 November, amending the Law on health protection against ionising radiation approved by Royal Decree 783/2001, of 6 July (BOE 18.11.2010).
3. Royal Decree 102/2014, of 21 February for the responsible and safe management of spent nuclear fuel and radioactive waste (BOE 08.03.2014).
4. Royal Decree 1440/2010, of 5 November, approving the Statute of the Nuclear Safety Council (BOE 22.11.2010).

5. Royal Decree 229/2006, of 24 February, on the control of high activity radioactive sources and orphan sources (BOE 28.02.2006). This RD was amended by:
   - Royal Decree 1308/2011, of 26 September, on the physical protection of nuclear facilities and materials, and radioactive sources (BOE 07.10.2011).
6. Royal Decree 775/2006, of 23 June, creating the Inter-ministerial Committee for establishing the criteria that must be met by the site for the Centralised Temporary Storage facility for nuclear fuel and high level waste and the associated technology centre.(BOE 05.07.2006).
7. Royal Decree 413/1997, of 21 March, on the radiation protection of off-site workers at risk of exposure to ionising radiation due to intervention in controlled areas (BOE 16.04.1997).
8. Royal Decree 1132/1990, of 14 September, establishing fundamental radiation protection measures for persons submitted to medical examinations and treatments (BOE 18.09.1990). This Royal Decree was amended by:
   - Royal Decree 220/1997, 14 February regulating academic titles of specialist in hospital radiography (BOE 01.03.1997).
   - Royal Decree 1976/1999, of 23 December, establishing the quality criteria for radiodiagnostics (BOE 29.12.1999).
9. Royal Decree 815/2001, of 13 July, on the justification for the use of ionising radiation for the radiation protection of people with medical exposure (BOE 14.07.2001).
10. Royal Decree 1085/2009, of 3 July, approving the Regulation on the installation and use of X ray apparatuses for the purpose of medical diagnosis (BOE 18.07.2009).
11. Royal Decree 1308/2011, of 26 September, on the physical protection of nuclear facilities and materials, and radioactive sources (BOE 07.10.2011). This RD was amended by:
   - Royal Decree 1086/2015, of 4 December, amending Royal Decree 1308/2011, de 26 September, on the physical protection of the facilities and the nuclear materials and radioactive sources (BOE 18.12.2015).
12. Royal Decree 1464/1999, of 17 September on activities of the first part of the nuclear fuel cycle (BOE 05.10.1999).
13. Royal Decree 1546/2004, of 25 November, approving the Statute of the Nuclear Safety Council (BOE 14.07.2004). This law has been amended by:
   - (Royal Decree 1428/2009, of 11 September BOE 12.09.2009).
   - (Royal Decree 1276/2011, of 16 September BOE 17.09.2011).
14. Regulation on coverage of nuclear risks. (Royal Decree 2177/1967, of 22 July BOE 18.09.1967). This Law was amended by:
   - Decree 742/1968, de 28 March, modifying Article 66 of the Regulation.
   - And will be partially repealed by the entry into force of Law 12/2011, of 27 of May, on civil liability for nuclear damage (BOE 28.05.2011).
15. Royal Decree 110/2015, of 20 February, on waste from electrical and electronic devices (BOE 21.02.2015).
16. Royal Decree 1428/1986, of 13 June (BOE 11.07.1986). This RD was amended by:
   - Royal Decree 903/1987, of 10 July (BOE 11.07.1987).
17. Royal Decree 243/2009, of 27 February, regulating the monitoring and control of movements of radioactive waste and spent nuclear fuel across member states or with

an origin or destination outside the EU (BOE 02.04.2009). This RD was amended by:

- Royal Decree 102/2014, of 21 February, for the responsible and safe management of spent nuclear fuel and radioactive waste.

18. Royal Decree 97/2014, of 14 February, regulating operations for the transport of dangerous goods by road in Spanish territory (BOE 27.02.2014).
19. Royal Decree 412/2001, of 20 April, regulating different aspects related to the transport of dangerous goods by rail (BOE 08.05.2001), amended by Ministerial Order of 1/02/2007.
20. Royal Decree 1749/1984, of 1 August, approving the National Regulation for the transport of dangerous goods by air, (BOE 02.10.1984) amended by Ministerial Order of 28/12/1990 and by Ministerial Order FOM/456/2014, of 13 March.
21. Royal Decree 145/1989, of 20 July, approving the Regulation on the installation and use of X ray apparatuses for the purpose of medical diagnosis (BOE 13.02.1989).

3. Council Instructions

- ✓ Nuclear Safety Council Instruction IS-01, of 31 May 2001, which defines the format and content of the individual radiological monitoring document (Radiological Passport) regulated in Royal Decree 413/1997 (BOE 6.8.2001)
- ✓ Nuclear Safety Council Instruction IS-02, revision 1, of 1 September 2004, on documentation relating to Refuelling Activities at Light-water Nuclear Power Plants (BOE 16.9.2004).
- ✓ Nuclear Safety Council Instruction IS-03, of 6 November 2002, on the qualifications required to obtain recognition as an expert in protection against ionising radiations (BOE 12.12.2002).
- ✓ Nuclear Safety Council Instruction IS-04, of 5 February 2003, regulating the transference, filing and custody of documents relating to the radiation protection of the workers, the general public and the environment prior to the transference of the licence ownership of the nuclear power plants for dismantling and decommissioning (BOE 28.2.2003).
- ✓ Nuclear Safety Council Instruction IS-05, of 26 February 2003, defining the values of exemption for nuclides as established in Tables A and B of Annex I of Royal Decree 1836/1999 (BOE 10.4.2003).
- ✓ Nuclear Safety Council Instruction IS-06, of 9 April 2003, defining Training Programmes on basic and specific radiation protection matters, regulated by Royal Decree 413/1997 of 21th March in relation to nuclear and radioactive facilities of fuel-cycle (BOE 3.6.2003). On 28 October 2004, the CSN issued a circular informing all external companies, clarifying certain aspects of the implementation of this instruction.
- ✓ Nuclear Safety Council Instruction IS-07, of 22 June 2005, on fields of application of the radioactive facilities personnel licences (BOE 20.7.2005).
- ✓ Nuclear Safety Council Instruction IS-08, of the 27 July 2005, on the criteria applied by CSN to request specific advice on radiation protection from the owners of the Nuclear and Radioactive Facilities (BOE 5.10.2005).

- ✓ Nuclear Safety Council Instruction IS-09, of 14 June 2006, establishing the criteria to be applied for the systems, services and procedures of physical protection for nuclear facilities and materials (BOE 07.7.2006).
- ✓ Nuclear Safety Council Instruction IS-10, of 25 July 2006, establishing the Criteria for reporting events to the Nuclear Safety Council by the nuclear power plants (BOE 19.9.2014).
- ✓ Nuclear Safety Council Instruction IS-11, of February 21 2007, on licenses for operating personnel of nuclear power plants (BOE 26.4.2007).
- ✓ Nuclear Safety Council Instruction IS-12, of 28 February 2007, defining the qualification and training requirements of non-licensed staff and non-licensed off-site personnel of nuclear power plants. (BOE 11.5.2007).
- ✓ Nuclear Safety Council Instruction IS-13, of February 21 2007, on licenses for operating personnel of nuclear power plants (BOE 7.5.2007).
- ✓ Nuclear Safety Council Instruction IS-14, of 21 March 2007, on the Radiological Criteria for the Release of Nuclear Installation Sites (BOE 8.11.2007).
- ✓ Nuclear Safety Council Instruction IS-15, revision 1, of 5 May 2016, on the requirements for monitoring the effectiveness of maintenance at the nuclear power plants (BOE 16.6.2016).
- ✓ Nuclear Safety Council Instruction IS-16, of 23 January 2008, regulating the periods of time which documents and records of radioactive facilities must be remain filed for.(BOE 12.2.2008).
- ✓ Nuclear Safety Council Instruction IS-17, 30 January, on the recognition of training courses and programmes for personnel that manage the operation of or operate equipment in X-ray facilities for medical diagnosis and the accreditation of the personnel of said facilities (BOE 19.2.2008).
- ✓ Nuclear Safety Council Instruction IS-18, of 2 April 2008, on the criteria applied by the CSN to demand from the licensees of radioactive facilities the reporting of radiological events and incidents (BOE 16.4.2005).
- ✓ Nuclear Safety Council Instruction IS-19, of 22 October 2008, on the requirements of the nuclear facilities management system (BOE 8.11.2008).
- ✓ Nuclear Safety Council Instruction IS-20, of 28 January 2009, establishing safety requirements relating to spent fuel storage casks (BOE 18.2.2009).
- ✓ Nuclear Safety Council Instruction IS-21, of January 28 2009, on the requirements applicable to modifications at nuclear power plants (BOE 19.2.2009).
- ✓ Nuclear Safety Council Instruction IS-22, of 1 July 2009, on safety requirements for the management of ageing and long-term operation of nuclear power plants (BOE 10.7.2009).
- ✓ Nuclear Safety Council Instruction IS-23, of 4 November 2009, on in-service inspection at nuclear power plants (BOE 24.11.2009).
- ✓ Nuclear Safety Council Instruction IS-24, of 19 May 2010, regulating the filing and periods of retention of the documents and records of nuclear facilities (BOE 1.6.2010).
- ✓ Nuclear Safety Council Instruction IS-25, of 9 June 2010, on criteria and requirements on the performance of probabilistic safety assessments and their applications for nuclear power plants (BOE 24.6.2010).
- ✓ Nuclear Safety Council Instruction IS-26, of 16 June 2010, on basic nuclear safety requirements applicable to nuclear installations (BOE 08.7.2010).

- ✓ Nuclear Safety Council Instruction IS-27, of 16 June 2010, on general nuclear power plant design criteria (BOE 8.7.2010).
- ✓ Nuclear Safety Council Instruction IS-28, of 22 September 2010, on the technical specifications that second- and third-category radioactive facilities must observe (BOE 11.10.2010).
- ✓ Nuclear Safety Council Instruction IS-29, of 13 October 2010, on safety criteria at spent fuel and high-level waste storage facilities (BOE 2.11.2010).
- ✓ Nuclear Safety Council Instruction IS-30, Rev 1, of 21 February 2013, on the requirements of the fire protection programme at nuclear power plants (BOE 30.11.2016).
- ✓ Nuclear Safety Council Instruction IS-31, of 26 July 2011, on the criteria for the radiological control of waste materials generated in nuclear facilities (BOE 17.9.2011).
- ✓ Nuclear Safety Council Instruction IS-32, of 16 November 2011, on Plant Technical Specifications of nuclear power plants (BOE 5.12.2011).
- ✓ Nuclear Safety Council Instruction IS-33, of 21 November 2010, on the radiological criteria for the protection against exposure to natural radiation (BOE 26.1.2012).
- ✓ Nuclear Safety Council Instruction IS-34, 18 January 2012, on criteria in relation to radiation protection measures, the notification of nonconformities, the availability of people and means during emergencies, and load surveillance during the transport of radioactive material (BOE 4.2.2012).
- ✓ Nuclear Safety Council Instruction IS-35, December 4 2013, relating to the treatment of design modifications of radioactive material transport packages accompanied by certificates demonstrating their Spanish origin and of the physical or operational modifications (BOE 4.1.2014).
- ✓ Nuclear Safety Council Instruction IS-36, January 21 2015, on emergency operating procedures and the management of severe accidents at nuclear power plants (BOE 17.2.2015).
- ✓ Nuclear Safety Council Instruction IS-37, of January 21 2015, on the analysis of design basis accidents at nuclear power plants (BOE 26.2.2015).
- ✓ Nuclear Safety Council Instruction IS-38, of 10 June 2015, on the training of persons involved in the transport of radioactive material by road (BOE 6.7.2015).
- ✓ Nuclear Safety Council Instruction IS-39, of 10 June 10 2015, regarding control and monitoring in the manufacturing of packages for the transport of radioactive material (BOE 6.7.2015).
- ✓ Nuclear Safety Council Instruction IS-40, of 26 April 2016, regarding documents that must be provided when requesting authorisation for commercialisation or providing technical assistance of appliances, equipment, and accessories that contain radioactive material or are generators of ionising radiation. (BOE 13.5.2016).
- ✓ Instruction IS-41, of 26 July 2016, of the Nuclear Safety Council, approving the requirements for the physical protection of radioactive sources (BOE 16.9.2016).
- ✓ Instruction IS-42 of 26 July 2016, of the Nuclear Safety Council, establishing the Council's notification criteria for events occurring during the transport of radioactive material (BOE 22.9.2016).

Annex B

Licensing process for nuclear and radioactive facilities

The licensing process, for both nuclear and radioactive facilities, is governed by the Nuclear and Radioactive Facilities Regulation (RINR) approved by Royal Decree 1836/1999, of 3 December.

In accordance with the RINR, these authorisations shall be granted by the Ministry of Energy, Tourism and the Digital Agenda (MINETAD), which will be directed by applications along with the documentation required in each case. MINETAD shall issue a copy of each application and the documentation to the Nuclear Safety Council (CSN) for issue of the mandatory report.

The CSN reports are mandatory and, moreover, biding where negative or where they reject an application and, where positive, all conditions established are binding.

Thus, MINETAD shall issue, in each case, a copy of all documentation to the Autonomous Communities with competencies in the area of spatial and environmental planning in the territory in which the facility is to be located or the planning zone provided in basic regulation on planning of nuclear and radiological emergencies, for them to present their objections within one month.

Having received the CSN report and subject to the rulings, reports and objections that may arise, MINETAD shall adopt the appropriate resolution.

1. Licensing system for nuclear facilities

According to the RINR, nuclear facilities are:

1. Nuclear power plants
2. Nuclear reactors
3. Factories that use nuclear fuel to produce nuclear substances and those where nuclear substances are treated
4. Nuclear substance storage facilities
5. Devices and facilities that use nuclear fusion or fission to produce energy or with a view to the production or development of new energy sources.

In accordance with the RINR, nuclear facilities require, for their functioning, different administrative authorisations, in accordance with each case, which are: preliminary or siting authorisation, construction authorisation, operating authorisation, modification authorisation and dismantling and decommissioning authorisation, which ends with a declaration of decommissioning, or authorisation for dismantling and closure, leading to a declaration of closure. The procedure for granting each of these authorisations is regulated in the Regulation itself and is summarised below:

Preliminary or siting authorisation

The preliminary or siting authorisation is an official recognition of the proposal and the suitability of the chosen site. The granting of this allows the licensee to begin preliminary infrastructure works that are authorised and request the authorisation for the construction of the facility.

The application for preliminary authorisation must be accompanied by the following documents:

a) Declaration of the needs intended to be met, justification of the facility and the site chosen.

b) Descriptive report of the fundamental elements comprising the facility, along with the basic information on same.

c) Draft generic design of construction, including phases and deadlines of completion and preliminary economic study of financial investments and costs forecast.

d) Study of characterisation of the site and the area of influence of the facility.

e) Plans to supervise the project and guarantee quality during construction.

f) Description of the activities and preliminary infrastructure works intended to be carried out.

In the processing of this request, a public information period which is described in detail in point 3 of this Annex, is opened.

Construction authorisation

Entitles the licensee to initiate construction of the facility and to request the authorisation of the facility.

This application is accompanied by the following documentation:

a) General design of the facility

b) Procurement programme

c) Budget, financing, execution phase and technical collaborative regime

d) Economic study, updating the one presented with the preliminary report

e) Preliminary Safety Reports, which, at the same time must contain:

1. Description of surrounding area
2. Description of the facility
3. Analysis of the accidents foreseen and their consequences
4. Analytical radiological study
5. Updating of the preliminary organisation for the request for the supervision of the development of the project and quality guarantee during construction.
6. Organisation planned for the future operation of the facility and preliminary programme for training personnel at the facility.
7. Preparatory radiological environmental monitoring programme.
8. Construction quality guarantee programme.

f) Technological, economic, and financial decisions of dismantling and decommissioning

g) Concessions and administrative authorisations granted by other Ministries and Public Administrations, or accrediting documents, having requested them with all necessary requirements.

During construction and assembly of a nuclear facility and before proceeding with the loading of the fuel or admittance of nuclear substances at the facility, the licensee of the authorisation is obliged to carry out a programme of pre-nuclear tests that accredits the adequate performance of the equipment or parts of the facility, both in relation to nuclear safety and radiological protection and in the applicable regulatory and technical regulations.

The pre-nuclear tests programmes shall be proposed by the licensee of the authorisation and shall require the approval of the Directorate General for Energy Policy and Mines from MINETAD, subject to the mandatory CSN report.

The results of the pre-nuclear tests will be presented to the Directorate General of Energy Policy and Mines and the CSN for their analysis before the operating authorisation be granted.

Operating authorisation

This authorisation entitles the licensee to load nuclear fuel or to admit nuclear substances at the facility, to carry out the nuclear tests programme and to operate the facility under the conditions established in the authorisation. Initially it will be granted provisionally until nuclear tests have been completed satisfactorily.

To obtain the operating authorisation, the licensee must present the following documents.

a) Safety Study: must contain sufficient information to carry out an analysis of the facility from a nuclear safety and radiation protection perspective, and an analysis of the risk arising from the functioning of the facility, both in normal conditions and in accident conditions. It must refer to the following themes:

   1. Complementary data obtained during construction of the site and its characteristics.
   2. Description of the facility and processes to take place there
   3. Analysis of foreseeable accidents and their consequences
   4. Analytical radiological study of the facility
   5. Radiological environmental monitoring programme

b) Regulation of operation. Must contain the following information:

   1. List of positions with nuclear responsibility
   2. Organisation and functioning of staff and description of the management of safety implemented
   3. Regulations of operation under normal conditions and accident conditions

c) Operating Technical Specifications (OTSs): They will contain the limit values that affect the security of the minimum operating conditions

d) On-site emergency plan: This will detail the measures planned by the licensee and the assigning of responsibilities in accident conditions

e) Nuclear tests programme: this will describe tests, their objectives, the specific techniques and the results forecast

f) Quality guarantee manual: This will establish the scope and content of the quality programme applicable to systems, structures and components relating to safety

g) Radiological protection manual. This will include radiological protection of the facility

h) Radioactive waste and spent fuel management plan: This will include a system for the possible clearance of waste materials with radioactive content

i) Final economic study: Will analyse compliance with the economic and financial provisions and will express the total sum for the facility

j) Dismantling and decommissioning plans: This will outline the disposal of waste generated and will include the study of the cost and the economic and financial provision to guarantee decommissioning

Once the nuclear test programme is completed, the licensee of the authorisation must issue to the Directorate General of Energy Policy and Mines and the CSN the results of said programme and the proposal of modifications in the OTSs if advisable in light of the tests carried out.

The CSN will issue a report to MINETAD on the results of the tests and the modifications that, in such cases, may be necessary to introduce along with the conditions of the operating authorisation for the established term. MINETAD will then issue the operating authorisation for the corresponding term.

Modification authorisation

The RINR considers that modifications to the design or conditions of operation that affect the nuclear safetyor radiation protection of the facility or the performance of tests at same, must be analysed in advance by the licensee to ensure that they comply with the criteria, standards and conditions upon which the authorisation is based. If, as a result of said analysis, the licensee concludes that all aforementioned requirements are still guaranteed, the modifications may be carried out, providing periodic reports to the competent regulatory authority. If, on the contrary, the modification of the design represents a change of criteria, standards and conditions on which the operating authorisation is based, the licensee must request an authorisation for modification, which must be obtained before the entry into service of the modification or the performance of the tests. Independently of the authorisation mentioned, when, in the judgement of the regulatory authorities, the modification is of extensive scope or implies significant construction or assembly works, the licensee must request an authorisation for the execution and assembly of the modification, authorisation which must be obtained before beginning assembly or construction work pertaining to these types of modification.

The application for authorisation for modification must be accompanied by the following documents:

a) Technical description of the modification

b) Safety analysis

c) Identification of the documents that would be affected by the modification

d) Identification of the tests necessary prior to resumption of operation

A request for authorisation for execution and assembly of the modification, where required, must be accompanied by the following information:

a) General description of the modification, identifying the reasons for it

b) Regulation to apply in the design, construction, assembly and testing of the modification

c) Basic design of the modification

d) Planned organisation and quality guarantee programme for the execution of the project

e) Identification and scope of the content of the analysis necessary to demonstrate the compatibility of the modification with the rest of the facility and to guarantee that the safety levels are maintained

f) Destination of the equipment to be replaced

g) Acquisition plan and budget in the case of large-scale modifications

Dismantling and decommissioning authorisation

Once the authorisation for operation has expired, this authorisation allows the licensee to begin decontamination activities, disassembly of equipment, demolition of structures and the removal of material to allow, ultimately, for the full or restricted liberation of the site. The dismantling process shall end with a declaration of decommissioning.

The request for the dismantling and decommissioning authorisation must be accompanied by the following documents:

a) Safety Study

b) Regulation of operation

c) Technical specification applicable during the dismantling phase

d) Quality guarantee manual

e) Radiological protection manual

f) On-site emergency plan

g) Radioactive waste and spent fuel management plan

h) Site restoration plan

i) Economic study of the dismantling process and financial provisions to meet the cost of same

j) Plan for the control of cleared materials

The authorisation for dismantling and decommissioning shall include the general approach to same and, if this is to be done in different phases, it shall regulate only the activities provided for in the immediate execution phase.

Once the dismantling activities are completed, when compliance with the provisions of the site restoration plan has been verified and other technical conditions established in the dismantling programme, MINETAD shall issue a declaration of decommissioning, subject to the report of the CSN. This declaration will release the licensee from their responsibility as operator of same and will define, in the case of restricted liberation of the site, the limits of use applicable and the body responsible for their maintenance and for monitoring compliance.

Said Ministry, prior to the declaration of decommissioning, shall transfer, for the purposes of presenting objections within a period of one month, to the corresponding Autonomous Communities with competencies in relation to spatial planning and the environment in whose territory the facility is located.

Authorisation for dismantling and closure (for spent nuclear fuel and radioactive waste disposal facilities)

At spent nuclear fuel and radioactive waste disposal facilities, this authorisation entitles the licensee to complete engineering and other works that are required to guarantee the long-term safety of the disposal system, and the dismantling activities of auxiliary facilities, where so determined, allowing ultimately for the delimiting of areas that should be subject to control and radiological or other forms of monitoring, for a determined period of time and the release from control of other areas of the site. The dismantling and closure process shall end with a declaration of closure issued by the Ministry of Energy, Tourism and the Digital Agenda, subject to the report of the Nuclear Safety Council.

2. Licensing system for radioactive facilities

In accordance with the RINR, radioactive facilities are defined as:

- ✓ Facilities of any kind that contain a source of ionising radiation.
- ✓ Apparatus producing ionising radiations and operating at a differential potential of more than 5 kV.
- ✓ Premises, laboratories, factories and facilities where radioactive materials are produced, used, possessed, treated, or handled, or where radioactive materials are stored, except incidental storage during transport.

Radioactive facilities are divided into three categories.

- ✓ Category 1 radioactive facilities are those of the nuclear fuel cycle, industrial irradiation facilities and those facilities where significant inventories of radioactive substances are handled with a potentially significant radiological impact. Radioactive facilities of the nuclear fuel cycle, that is factories producing uranium, thorium and their compounds or factories producing natural uranium fuel elements, shall require the same authorisations as nuclear facilities. For the request, processing and granting of these authorisations, the process described in section 1 above shall be followed, with the adaptation of the documents corresponding to the special characteristics of these facilities.
- ✓ Category 2 and 3 radioactive facilities are those radioactive facilities for scientific, medical, commercial or industrial processes that cannot be considered Category 1, and are classified in the corresponding category, based primarily on their radiological characteristics. This type of facility will require an operating authorisation, a declaration of decommissioning and, where applicable, authorisation for the modification or change of licensee.

The application for authorisation for operation of these radioactive facilities for scientific, medical, commercial or industrial purposes must be accompanied by, at least, the following documents:

a) Descriptive design of the facility

b) Safety Study: Analysis and evaluation of the risks that might arise in normal operation of the facility or as a result of an accident

c) Verification of the facility: Containing a description of the tests undergone at the facility

d) Regulation of operation: Practical measures that guarantee the safe operation of the facility

e) List of planned personnel, organisation and responsibilities of each position

f) On-site emergency plan: Measures planned and assignment of responsibilities in accident conditions

g) Decommissioning plans and economic provisions to guarantee same

h) Economic budget of the investment to be made

For Category 1 facilities the following additional documentation shall be attached:

a) Information on the site and surrounding terrains

b) As part of the Regulation of Operation:

- ✓ Quality guarantee manual
- ✓ Radiological Protection Manual
- ✓ Operating Technical Specifications

c) Physical Protection Plan

The Ministry of Energy, Tourism and the Digital Agenda is responsible for the granting of the authorisations for operation, change of licensee and declarations of decommissioning for Category 1 Radioactive Facilities, while said competencies are delegated to the licensee by the State Secretariat for Energy through MINETAD Order IET/556/2012, of 15 March. In said authorisation, the relevant documentation will be transferred to the Autonomous Community so that objections can be presented within the term of one month.

The granting of other authorisations to radioactive facilities regulated in this chapter is the responsibility of the Director General of Energy Policy and Mines.

When the licensee is ready to initiate operations of the facility, it shall inform the CSN so that it can perform the inspection of same. Once the CSN has adjudged that the facility will function in safe conditions, it shall inform MINETAD so that it can issue a "notification of start-up", that will allow the licensee to initiate operations at the facility.

The changes that affect the licensee of the facility, its location, the activities permitted by the granting of the authorisation, the category of the facility, the incorporation of particle accelerators or additional radioactive material not previously authorised shall require authorisation through the same process by which the authorisation for operation was granted.

The changes and modifications that affect other aspects of the design or the operational conditions authorised at the facility shall require the express acceptance of the Nuclear Safety Council prior to implementation, with this body informing MINETAD.

The request for the declaration of decommissioning must be accompanied by the following documentation:

a) Technical study of decommissioning

b) Economic study, including the cost of decommissioning and financial provisions for same

Once the absence of radioactive substances or equipment producing ionising radiation and the results of the contamination analysis of the facility are verified, a report will be issued to MINETAD, which will then issue the declaration of decommissioning of the facility.

In accordance with the provisions of the Spanish Constitution, the different Statutes of Autonomy and the related regulation, the services and functions of MINETAD in relation to Category 2 and 3 radioactive facilities have been transferred to the different Autonomous Communities. The Autonomous Communities to which these transfers have been made are: Catalonia, the Basque Country,

the Balearic Islands, Murcia, Extremadura, Asturias, Madrid, Galicia, Cantabria, the Canary Islands, Ceuta, Navarra, Valencia, Castilla y León, La Rioja and Aragón[21].

3. Information and public participation in the process of the authorisation of the facilities

Both the RINR and Law 21/2013 on environmental assessment require public information processes, the most relevant of which is that which is carried out as part of the process for prior authorisation of a nuclear or radioactive facility of the nuclear fuel cycle.

The RINR establishes, in relation to the processing of the prior authorisation of nuclear and radioactive facilities of the nuclear fuel cycle that once the request for authorisation is received, the Government Delegation in the Autonomous Community where it is planned to locate the facility shall process to open a public information period. This will begin with the publication in the Official State Gazette and in that of the relevant Autonomous Community, of an announcement indicating the purpose and main characteristics of the facility. In the thirty days following the announcement, the persons and bodies considered affected by the project can present the objections they deem appropriate. Once the thirty-day public information term expires, the Government Delegation shall carry out the pertinent tests; both in relation to the documentation presented by the public and written objections and issue a report, sending the file to MINETAD and a copy to the CSN.

Law 21/2013 establishes that the following, among others, must be subject to an environmental impact assessment: nuclear power plant projects and other nuclear reactors, irradiated nuclear fuel reprocessing facilities, facilities designed for production or enrichment of nuclear fuel, disposal of spent nuclear fuel, exclusively the disposal of radioactive waste or exclusively for storage (for a period of more than ten years) of irradiated nuclear fuel or radioactive waste in a place other than the production site. In these cases, the public information process shall be carried out jointly with the Environmental Impact Assessment (EIA) required by Law 21/2013 and for the preliminary authorisation of the future facility required by the RINR. The Environmental Impact Declaration is prepared by the Ministry of Agriculture and Fisheries, Food and the Environment, in coordination with the CSN and is issued jointly with the preliminary authorisation for the facility. In addition, the dismantling or decommissioning of the plants and nuclear reactors is also subject to ordinary Environmental Impact Assessment.

The RINR also requires that during the construction, operation and dismantling of the nuclear power plants, an Information Committee operates, with the status of a collegiate body. This Committee has the function of informing the different entities represented in the development of activities regulated in the corresponding authorisations and dealing with those questions of interest for said entities. It is presided over by a representative of MINETAD and made up of a representative of: the licensee of the facility, the CSN, the Government Delegation, the Autonomous Community, the Directorate General for Civil Protection and Emergencies and of the municipalities included in zone 1 defined in the corresponding off-site emergency plans of the nuclear

[21] *The third additional provision of Law 15/1980, creating the CSN, allows it to delegate to the Autonomous Communities the exercise of certain function attributed to it. Nevertheless, such delegation of functions shall not be considered a transfer as, in accordance with the Law creating the CSN, it has exclusive competency for nuclear safety throughout the national territory.*

power plants. This Committee may also include other representatives of Public Administration, where the nature of the matters being dealt with so requires.

In the municipal ambit, the Association of Municipal Authorities in nuclear power plant areas (AMAC), which acts as an interlocutor with the Administration in different matters relating to nuclear power plants.

On another level of information and in more general terms, the CSN is entrusted with, among others, the function of informing public opinion on matters in its area, without prejudice to the publicity of its administrative actions in the terms legally established. Also, the CSN's Advisory Committee, created by Law 33/2007, of 7 November (reforming Law 15/1980, of 22 April creating the Nuclear Safety Council) whose purpose is to issue recommendations to said Council in relation to transparency and the proposal of measures that strengthen public access to information and participation of citizen in matters of its competency. It is comprised of representatives of the CSN, different Ministries, Autonomous Communities, licensees of nuclear facilities, trade unions, experts, NGOs and municipalities, among others.

Finally, it must be noted that in 2004 Spain approved and ratified the Convention on Access to Information, Public Participation in Decision-making and Access to Justice in Environmental Matters in Aarhus (Denmark). Law 27/2006, of 18 July, regulating the rights of access to information, public participation and access to justice on environmental matters, recognises the right of any physical or legal person to access information on the environment which is in the power of the Public Administrations, and the obligation of these to distribute said information.

This page blank

Annex C

Organisation of emergency response

Nuclear and radioactive waste management

The management of nuclear and radioactive emergencies in Spain is regulated by the national system for civil protection and the requirements for the use of nuclear energy and ionising radiation.

From a civil protection standpoint, the general organisation principles are established, along with the responsibilities, rights and duties of the citizens, public administrations and licensees with regards to the planning, preparedness and response to emergency situations. Likewise, emergency plans are established for off-site action whenever accidents in the nuclear facilities have an impact on third parties.

From the standpoint of nuclear regulation, on-site emergency plans are required to be available for each radiological practice, and the specific criteria regarding intervention levels and techniques are established, along with the protection measures on which plans are based.

The Basic Nuclear Emergency Plan (PLABEN), approved by Royal Decree 1456/2004 of 25 June establishes the planning and preparation in emergency situations that might arise from accidents in nuclear power plants in operation or shut down while spent fuel is stored in their pools.

Also, the Basic Directive for the Planning of Civil Protection against Radiological Risk, approved by Royal Decree 1546/2010 of 19 November contains the minimum criteria that must be followed by the different Public Administration and, where applicable, the licensees of regulated nuclear and radioactive facilities and the licensees of other facilities and activities where there exists an exceptional radiological risk. Among others are the facilities dedicated to the disposal of low and medium level waste (El Cabril) and the storage of spent fuel and high level radioactive waste. This includes both ITS facilities, currently under the regulation of PLABEN and those that at a determined moment shall come under the DBRR, like the CTS.

At present, the ITS facilities in operation include those at the José Cabrera nuclear power plant currently being dismantling, the Trillo nuclear power plant and the Ascó nuclear power plant, in different phases of licensing and construction, the ITS facilities at the Almaraz nuclear power plant and Santa María de Garoña, while a request for authorisation is expected for the CTS at the Cofrentes nuclear power plant, and the start of the procedure for the Environmental Impact Assessment.

This DBRR requests that each Autonomous Community develops a special plan to tackle the radiological risks that may affect it where the main competent authorities, public bodies involved and international partner bodies in the event of emergency are mentioned.

Nuclear and Radioactive Facility Regulation (RINR)

The RINR requires that any nuclear or radioactive facility, before obtaining the authorisation for operation and subsequent authorisation, prepare and present an Emergency Plan appropriate to the existing risks which are approved upon conceding said authorisations.

In accordance with the RINR, both the El Cabril disposal facility and the fuel elements factory are classified as nuclear facilities. Consequently, they must have in place an On-site Emergency Plan approved by MINETAD, subject to the report of the CSN.

Organisation of the CSN for emergency situations

Given the specific nature of nuclear and radiological emergencies, the Nuclear Safety Council (CSN) assumes a series of functions that go beyond the competencies of the organisation as a nuclear regulator.

To comply with these functions with an adequate degree of efficacy and efficiency, the CSN has in place and Emergency Response Organisation (ERO) that complements its ordinary organisation of work. This is managed by the Chairperson of the CSN and participate the technical and logistical units in accordance with an Emergency Action Plan (EAP) that is activated based on the seriousness of the accident that leads to the nuclear or radiological emergency.

The ERO of the CSN operates from an Emergency Room (SALEM) that is permanently attended to, and can respond to an emergency situation in a period of less than one hour. The Salem has in place communications systems and assessment tools to advise the managers of the emergency plans of the off-site response level activated based on the most conservative progress of the accident, on the potential consequences and the measures to protect the population which must be implemented based on the expected impact.

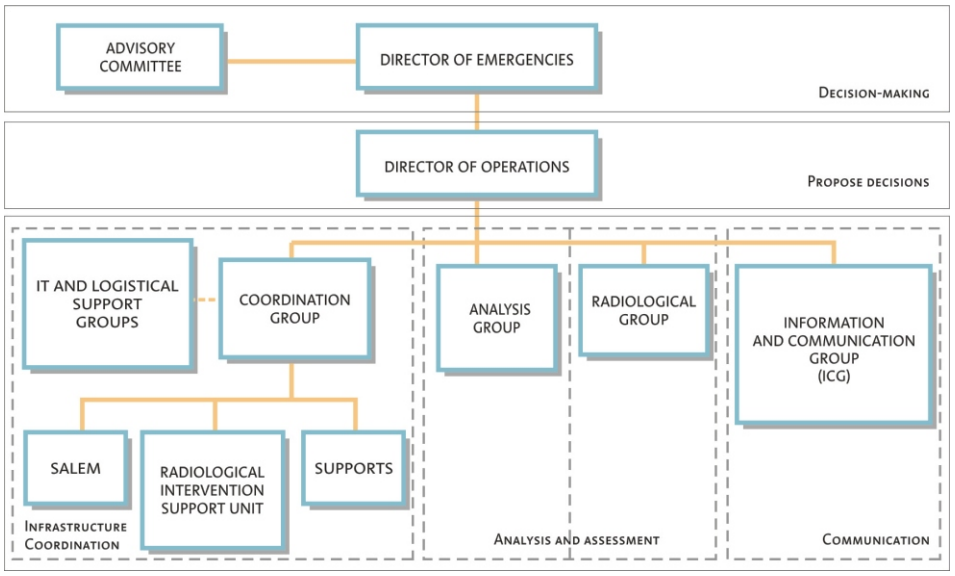
The capacities of the CSN itself in responding to emergencies are entirely through collaboration agreements and contracts with public and private entities through which it receives external support, in terms of both personnel and material, to provide emergency services under the supervision of the CSN.

The CSN's emergency action plan is supported by training and is independent of other training plans of those who participate in nuclear emergency plans off-site from the nuclear power plants but coordinated by same. Moreover, the Emergency Action Plan of the CSN has a programme of exercises and simulations of internal, national and international scope that allow for the verification of the operability of technical capacities and the implementation of the necessary improvements.

The ERO has a hierarchical structure which acts under the principle of unified command and complements the ordinary organisation of the CSN.

The ERO is structured across the following three hierarchical levels:

- ✓ Decision-making regarding recommendations to the directors of the plans.
- ✓ Proposal regarding decisions and measures to protect the population.
- ✓ Analysis and assessment of the events:
  - ➪ The Emergency Director (ED), advised by a committee comprising of the Plenary Meeting of the CSN, is responsible for running the ERO, making decisions and transmitting CSN recommendations to the Management of the applicable emergency plan and for cooperating with the competent authorities and informing the public. The ED role is a function of the Chairperson of the CSN.
  - ➪ The Director of Emergency Operations (DEO) is responsible for the coordination of all actions of the ERO and preparing proposals of recommendations that the ED must forward to the Management of the applicable emergency plan. The Director of Emergency Operations role is assumed by one of the two Technical Directors of the CSN or one of the Sub-directors.



➪ The Operative Groups are responsible for carrying out the technical activities necessary to prepare the recommendations. These shall be transmitted to the DEO and the ED, once the recommendations are transmitted to the Management of the applicable Off-site Emergency Plan which will activate and coordinate the intervention teams and will prepare the information to be communicated to the affected population.

Specifically, the missions of the Operative Groups of the ERO are the following:

✓ The mission of the Operational Analysis Group is to analyse accident causes and anticipate possible future developments, and to report the DEO on the measures that should be adopted in order to lead the emergency situation to a safe condition, bearing in mind that the responsibility for adopting appropriate preventive decisions and measures corresponds to the installation.

✓ The mission of the Radiological Group is to analyse the radiological situation generated by the accident, to propose appropriate measures to the DEO aimed at mitigating radiological consequences thereof affecting the public in general, the equipment and the environment, and to cooperate in their implementation.

✓ The mission of the Information and Communications Group (ICG) is to provide other ERO organs and bodies with which the CSN has assumed a prompt notification commitment with information on the facility or place of the accident that is necessary for the development of their functions. Likewise, the ICG is responsible for preparing the information on the emergency that, in fulfilment of the functions assigned to the CSN, has to be provided to the national and international media and the public.

✓ The mission of the Coordination Group (CG) is to maintain the ERO structure in full operational conditions, and to ensure the flow of information among all its organs and

with other entities. This group coordinates the Computer Support Group and the Logistics Support Group, and manages external support and emergency on-call teams.

- ✓ The Computer Support Group ensures the operative conditions of CSN corporate information systems in the event of an emergency, providing feasible alternatives, if needed, to guarantee the fulfilment of ERO basic functions, and provides technical support to ensure appropriate operative conditions of the Computer and Communications systems of specific use by the operational groups of the SALEM.
- ✓ The Logistics Support Group ensures the availability of all required logistics resources for the operation of the ERO, or offers feasible alternatives that guarantee the fulfilment of the basic functions thereof, and also guarantees ERO safety.
- ✓ The Sub-directorate General for Emergencies has been assigned within the CSN, among others, the responsibility for operation and maintenance of the SALEM, the management of the external supports and of the emergency on-call personnel. Therefore, CG responsibilities are closely linked to the operation of this Sub-directorate.

In the SALEM, the personnel may act in four different response modes (from 0 to 3) and its structure is varied based on the severity, complexity or duration of the emergency and the level of responsibility in decision-making, adapting to different levels of response based on the composition of the resources: Permanent Alert or Mode 0 (Technical Assistants), Reduced Response or Mode 1 (previous + DEO), Basic or Mode 2 (previous + Stand-by team) and extended or Mode 3 (which may include all CSN personnel).

The CSN endeavours to maintain its Emergency Response Organisation trained and up-to-date so that it can confidently and efficiently undertake the functions assigned by Law to the CSN in the event of an emergency, through the upgrading and acquisition of new material resources and signing of contract and protocols that allow it to avail of new equipment.

Instruction and Training of the ERO: Drills and Exercises

The Emergency Response Organisation (ERO) of the CSN participates on an on-going basis in the exercises and drills that guarantee efficiency in the case of emergency. It supervises annually the instruction and training of personnel with respect to the emergencies of the nuclear facilities and in particular in relation to the low and intermediate level radioactive waste management facility and the fuel element factory.

The CSN monitors annual emergency drills at all nuclear facilities through the activation and activity of the ERO at the Emergency Room (SALEM). Within the agreement between the Military Emergency Unit (MEU) and the CSN, material resources have been provided that allow for the setting up in a short space of time in the facilities of the General Barracks of the MEU at Torrejón de Ardoz (Madrid), of an SUPPORT Emergency Room (SALEM) for CSN staff transferred for such purpose. This would if occur if, once the SALEM is activated, circumstances arise forcing its evacuation.

The actions carried out in these drills are performed in conditions of maximum realism applying the existing procedures for the activation and action of the operative groups of the ERO. Moreover, these drills are practices in coordination with the corresponding Provincial and National Authorities, for the purpose of verifying the general efficiency of the existing procedures.

During the drill, the CSN transfers to the facilities inspection staff to verify the operability of the On-site Emergency Plan and carry out monitoring on-site, and may require the implementation of corrective actions that, in some cases, may arise from the observations made.

ENRESA participates actively in both the urgent phase drill and the management of the hypothetical radioactive waste generated and also during the tasks of the recovery phase. It participated in debates on the efficiency of decontamination techniques of urban and rural areas and under the supervision of the CSN manages the radioactive waste generated in these processes.

Participation of the CSN on the international level

The Spanish State is a Contracting Party of the international conventions on the Early Notification of Nuclear Accident and on Assistance in the Case of a Nuclear Accident or Radiological Emergency and is subject to the obligations for the exchange of information in the event of nuclear and radiological emergency. Moreover, it has subscribed agreements and protocols for the collaboration at Government level and between regulators.

Among others, the CSN has subscribed bilateral agreements on the exchange of information on nuclear and radiological emergencies with the ASN in France and the Portuguese Agency for the Environment, National Authority for Civil Protection and the Higher Technical Institute of the University of Lisbon in Portugal. Furthermore, CSN personnel have participated in some drills and exercises carried out at European nuclear power plants in countries such as France and Belgium.

Participation of the Military Emergency Unit in nuclear and radiological emergencies

Based on Organic Law 5/2005, of 17 November on the National Defence and the Agreement of the Council of Ministers of 17 October 2005, creating the Military Emergency Unit (MEU) to intervene immediately in severe emergency situations. RD 1097/2011 of 22 July approved the intervention protocol of the MEU to define the circumstances in which its intervention may be ordered. Said protocol indicates that the Ministry of Defence, by the delegation of the President of the Government, shall order the intervention of the MEU, whose actions must correspond with the provisions established in the applicable legislation in relation to civil protection and, especially, in relation to the distribution of the competencies of the State and the Autonomous Communities. The completion of the actions must be adopted by the Ministry of Defence at the request of the Ministry of the Interior and informing the authorities who requested the intervention. The start and end of the activities must be notified to the Department of National Security of the Presidency of the Government.

Royal Decree Governing the Activities of the National Radioactive Waste Management Agency (ENRESA) and its Financing

Royal Decree 102/2014, of 21 February, for the responsible and safe management of spent nuclear fuel and radioactive waste, assigns to ENRESA, among other functions, that of cooperating with the competent authorities in the event of nuclear or radiological emergencies. Both the PLABEN and the DBRR assign to ENRESA the management of radioactive waste that must be carried out in the emergency phase, under the coordination of the CSN.

This page blank

Annex D

Fund to finance the activities planned in the General Radioactive Waste Plan

The fund to finance the activities of the GRWP, which covers activities developed by ENRESA not only in relation to the management of radioactive waste and spent fuel but also in relation to the dismantling and decommissioning of nuclear facilities, as well as structure and R&D costs, is endowed with the proceeds of the fees indicated below, including the financial yield generated by same. Said rates are regulated by the Sixth Additional Provision of Law 54/1997 of 27 November, on the electrical sector, declared valid by Law 24/2013, of 26 December.

1. Fee relating to electricity fees (tolls)

This constitutes the funding channel of the costs corresponding to the management of radioactive waste generated at nuclear power plants, whose operation ceased definitively prior to 1 January 2010, and its dismantling and decommissioning, of those future costs corresponding to nuclear facilities of fuel element factories that, having definitively ceased operations, were not provided for during said operation and which, in some cases, may arise from the early cessation of operation of facilities for reasons beyond the control of the licensee.

Also included in this fee are sums to be allocated to the part of this Fund for the financing of the costs of managing the radioactive waste produced by those research activities that MINETAD determine to have been directly related to the generation of nuclear power, dismantling and decommissioning operations that must be carried out as a result of the mining and production of uranium concentrates prior to 4 July 1984, the costs arising from the reprocessing of nuclear fuel sent abroad prior to the entry into force of the Law establishing it and other costs specified by Royal Decree.

2. Fee relating to nuclear power plants

This constitutes the funding channel by which all costs incurred from 1 January 2010, corresponding to the management of radioactive waste and spent fuel generated at nuclear power plants in operation shall be financed by the licensees of nuclear power plants during such operation, regardless of the date of their generation, as well as those corresponding to their dismantling and decommissioning.

Thus, the allocations to municipalities affected by nuclear power plants shall be financed by the licensees of nuclear power plants or spent fuel or nuclear waste storage facilities under the terms established by MINETAD, along with the sums corresponding to the taxes accrued in relation to activities for the storage of radioactive waste and spent fuel, regardless of the date of generation.

3. Fee relating to the Juzbado Fuel Element Factory

Covers the provision of management services for radioactive waste arising from the manufacture of fuel elements, including the dismantling of the manufacturing facilities of same.

4. Fee relating to other facilities

Fee for the provision of services for the management of radioactive waste generated at other facilities other than those indicated above, such as radioactive facilities (medicine, industry, agriculture and research), CIEMAT or other companies. All of these costs are taken directly at the time of the provision of the services.

Control of the Fund

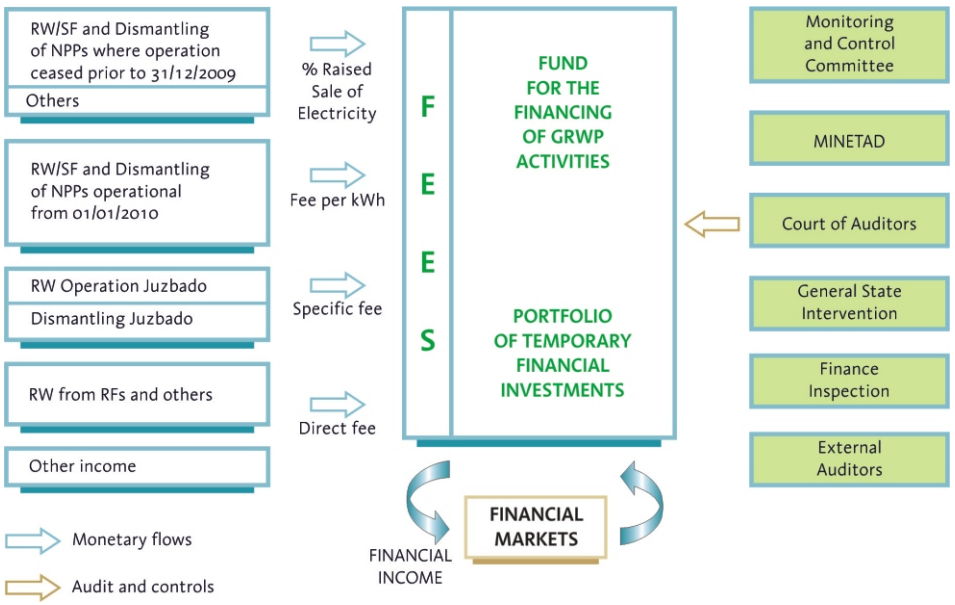
The management of the Fund is the responsibility of ENRESA and governed by the principles of security, profitability and liquidity. As has been indicated in successive National Reports, allocations to the Fund can only be used to fund the activities provided for in the GRWP. Upon the conclusion of the management period of radioactive waste and the dismantling of facilities covered by the GRWP, the total sums lodged to the Fund through the different funding channels must cover the costs incurred so that the final balance is zero.

The supervision, control and rating of transient investments made with the Fund correspond to the Committee for Security and Control ascribed to MINETAD, regulated by Royal Decree 102/2014. This Committee must prepare half-yearly reports, covering the situation of the Fund and the investments corresponding to their financial management as well as the rating of the management of the fund, including the observations deemed appropriate. Said reports are delivered to MINETAD, the Ministry of the Economy, Industry and Competitiveness and the Ministry of Finance and Public Administrations.

In addition to the activities of this Committee, Royal Decree 102/2014 establishes the obligation of ENRESA to present the following reports to MINETAD (which is responsible for the strategic management and monitoring and control of the activities and the plans of ENRESA, both technical and economic, through the State Secretariat for Energy):

- ✓ During the first semester of each year:
  - ➪ A report including the technical and economic aspects relating to the activities of the previous financial year.
  - ➪ An updated economic-financial study of the cost of the activities considered under the GRWP, including the remuneration of the management of the plan.
- ✓ Before 30 November of each year, a technical and financial justification of the annual budget corresponding to the following year and its projection for the following three years. In the event that, as an exception, if it were necessary to meet costs not projected in the above economic-financial study, ENRESA must issue, in advance, the corresponding justification.
- ✓ The month following each calendar quarter, a budget monitoring report.

The diagram below provides a general illustration of the system of financing of the activities of the GRWP and the mechanisms for its control:


RW/SF and Dismantling of NPPs where operation ceased prior to 31/12/2009
Others
RW/SF and Dismantling of NPPs operational from 01/01/2010
RW Operation Juzbado
Dismantling Juzbado
RW from RFs and others
Other income
% Raised Sale of Electricity
Fee per kWh
Specific fee
Direct fee
F
E
E
S
FUND FOR THE FINANCING OF GRWP ACTIVITIES
PORTFOLIO OF TEMPORARY FINANCIAL INVESTMENTS
FINANCIAL MARKETS
FINANCIAL INCOME
Monitoring and Control Committee
MINETAD
Court of Auditors
General State Intervention
Finance Inspection
External Auditors
Monetary flows
Audit and controls

This page blank

Annex E

Regime of civil liability for nuclear damage

International Conventions and national regulatory provisions

Spain is a Contracting Party to the Paris Convention and the Brussels Supplementary Convention on civil liability in the field of nuclear energy (international agreements established within the OECD Nuclear Energy Agency) signed in 1960 and 1963 respectively and both subsequently amended in 1964 and 1982, the most recent amendment,applied to both Protocols, was in February 2004.

Nevertheless, said Protocols have not entered into force at this time, so the existing regulatory framework is that established by the Protocol Agreements through chapters VII, VIII, IX and X of Law 25/1964, of 29 April, the Nuclear Energy Act, and by Royal Decree 2177/1967, approving the regulation of coverage of nuclear risks, and the first additional Provision of Law 17/2007, of 4 July, updating the limit of responsibility to €700 million until the entry into force of the Law developing the Protocols for modification.

Currently applicable regime of civil liability for nuclear damage

The applicable framework regulating civil liability for nuclear damage is based on the characteristics provided below, in accordance with the commitments acquired as a Contracting Party of the aforementioned Conventions.

The responsibility of the operator is objective, exclusive and limited in quantity (up to €700M), also limited to the term of 10 years (immediate damages) for the categories of damages considered.

The Ministry of Energy, Tourism and the Digital Agenda may establish a limit other than the €700M, but no lower than €30M, in the case of the transport of nuclear substances or any other activity of which the risk, in the judgement of the Nuclear Safety Council, does not require additional cover.

The categories of damages deemed compensable by the law are the following:

I. The loss of human life, bodily injury and material damages caused as a direct or indirect result of the radioactive properties or their combination with toxic properties, explosives or other dangerous properties of nuclear fuel or of the radioactive products or by-products found at a nuclear facility or nuclear substances that are generated, originate or are sent there.

ii. Other damages arising or originating in such a manner as so declared by the competent court.

iii. The loss of human life, bodily injuries and material damages causes as a direct or indirect result of ionising radiation emanating from any other source of radiation.

For the aforementioned categories of immediate damages, the operator of the nuclear facility is obliged to subscribe an insurance policy or any other financial guarantee up to equivalent cover.

For deferred damages, that is, those that occur, are alerted to or the party responsible for which is aware of after the term of ten years from the occurrence of the accident, the Government shall adopt the appropriate measures for their compensation.

In addition, the Law establishes the prevalence of payment of compensation for personal damage prior toall others. In the event that cover were not sufficient to meet these, the State shall arbitrate the legal measures to cover the difference.

In relation to the claim period, even though the specifically nuclear law does not so state explicitly, Law 1/2000 of 7 January, on civil procedure, establishes a period of five years as a general rule.

Although excluded from the aforementioned International Conventions, Category 1 radioactive facilities, as well as the transport of non-nuclear radioactive material, are obliged, according to Royal Decree 2177/1967, of 22 July, approving the regulations on the coverage of nuclear risk, to subscribe a policy for a minimum of 6,000 euros, with Category 2 and 3 facilities exempt from said obligation.

Regime of civil liability for nuclear damages once the protocols of 12 February 2004 modifying the Convention on Civil Liability for Nuclear Damages (Paris Convention) and of 12 February of 2004 modifying the supplementary Convention (Brussels Convention) enter into force

As previously explained, in February 2004 two new amendments to the Paris and Brussels Conventions were approved, which constitute an in-depth review of some of the basic elements of the regime of nuclear civil liability, and have required a substantial amendment to the domestic legislation to reflect the changes and specify those stipulations that, in accordance with the provisions of the Conventions, correspond to the Contracting Parties to determine in their national legislation. Law 12/2011, of 27 May, on civil liability for nuclear damage, has updated our legislation in line with both Protocols but will not enter into force in Spain until said Protocols have.

The aforementioned Law 12/2011 considers to be directly applicable the provisions contained in the amended Paris and Brussels Conventions as, having been published in the Official State Gazette, form part of domestic legislation as laws of higher status. Therefore, this Law only develops those provisions in which the Paris Convention grants a margin to the States to define certain aspects themselves. Consequently, the new regulation on civil liability in our country shall be based on the consolidated text of said Conventions and on the text of said Law.

Highlighted below are some of the most significant amendments in relation to the applicable regime.

Law 12/2011 includes new categories of damages that do not appear in the currently applicable regime, such as damage to the environment, loss of profit and remedial or preventive measures; provided that the damages are due to the radioactive properties of nuclear substances or where non-nuclear damages cannot be separated from nuclear damages.

The quantitative limits that have established in Law 12/2011 are determined by the application of the Conventions:

- ✓ The Paris Convention establishes a minimum of 700 million euros, which might be reduced to 70 million euros for facilities that, due to their low risk, are not susceptible to causing great damage and 80 million euros for the transport of nuclear material. Based on the above, the Law establishes that the Ministry of Energy, Tourism and the Digital Agenda, subject to the report of the Nuclear Safety Council, may determine a reduced sum appropriate to each situation, in consideration of the nature of the activity or facility.
- ✓ Meanwhile, the Brussels Convention establishes three tranches of funding for the compensation due to nuclear accidents. The first tranche covers, up to a minimum of 700 million euros established in the Paris Convention, or up to the sum indicated as the liability of the operator by the State. The second tranchecovers sums fixed in the first section up to 1.2 billion euros (this channel is assumed by the Contracting State of the facility). The third tranche(which would be the joint responsibility of all States which are Parties to the Brussels Convention) up to a total of 1.5 billion euros.

Law 12/2011 establishes a limit of liability for the operator at 1.2 billion euros, which shall be covered by the first and second tranches of liability of the Brussels Convention, with only the State liable for its equal share of the third tranche of same.

In relation to the regulation of liability in the case of accidents during the transport of nuclear material, Law 12/2011 refers directly to the provisions of the amended Paris Convention, which contains all cases pertaining to the liability for damages occurring during said transport. Law 12/2011 only pronounces in the case of the transport to or from third party countries that are not signatories to the Convention, in which cases the liability lies with the operator of the facility located in Spain. The Law also offers the possibility that the carrier might be considered responsible in place of the operator of the facility, provided that the competent authority authorises it and they have the agreement of the licensee of the facility. The carrier must also demonstrate that it has the financial guarantee required by Law.

With regard to the period of claims, Law 12/2011 stays within the remit of the Paris Convention, which establishes a general period for the filing of claims of 30 years from the moment of the accident in the case of death or personal damages and 10 years for other categories of damages. Within the general plan, the Convention establishes the possibility of a period of prescription or limitation of at least three years for victims to file a claim, from the time the aggrieved has knowledge of the damage occurred and the cause of same, or ought reasonably to have known. In accordance with the above, Law 12/2011 sets the term at three years. Thus, Law 12/2011 establishes priority rules for a period of three years from the moment of the accident, during which it is estimated that the most significant numbers of claims will be filed, which shall follow the following order: first the claims pertaining to personal damages shall be attended to, making reference to their quantification through the scales used by the leg

islation on traffic accidents, it being considered that its evaluation is the most suitable for the purposes of the Law. Secondly, claims arising from environmental damages shall be compensated, including the costs of remedial measures, those caused by preventive measures or possible damages caused by the measures. Finally, compensation for damage caused to goods and property, lost profits due to damage to goods and property and persons and those lost profits directly related to the use or enjoyment of a an environment that has been damaged. Once the initial period of three years has passed, claims shall be attended to with no distinction made between them. In the event that the compensation exceeds the quantitative limits established by Law, the State guarantees the reparation of personal damages and death within the national territory.

Law 12/2011 contemplates various options for the licensee of the facility to guarantee the liability; the most commonly used being the insurance policy. In relation to this type of guarantee the Law considers an amendment of the Statute of the Insurance Compensation Consortium so that

coverage may be provided for those categories of damages for which coverage is beyond the limits established in the Law, whether monetary or of the period of prescription.

With regards to the claim procedure, Law 12/2011 establishes that the claims shall be filed in accordance with the standard general procedure for this type of claim, which is established in Law 1/2000, of 7 January, on Civil Procedure.

The Law also regulates the civil liability for damages caused in accidents involving radioactive materials not regulated by the Paris Convention. A similar liability is set in the event of nuclear damages, objective and exclusive to the licensee of the facility and limited in quantity to the sums established in the annex of the Law, classified according to the type of materials and based on their activity. The rest of the particulars of this liability are similarly regulated in the event of nuclear damages. Nevertheless, it must be indicated that risks for environmental damage in accidents that involve radioactive materials that are not nuclear material must be governed by the applicable legislation in relation to environmental liability. To such effect, by virtue of Law 26/2007, of 23 October, on environmental liability, the Ministry of Energy, Tourism and the Digital Agenda, subject to reports from the Ministry of Agriculture and Fisheries, Food and the Environment and the Nuclear Safety Council, shall determine the minimum sum which must be guaranteed by the operator to respond to such damages.

Annex F

Actions relating to the post-Fukishima National Action Plan (NAcP)

As stated previously, spent fuel generated at Spanish nuclear power plants is stored in fuel pools located on-site at same, and casks located at individualised temporary storage (ITS) facilities existing on the sites of the Trillo, Ascó and José Cabrera nuclear power plants, the latter in dismantling.

After the accident at Fukushima, in accordance with the ENSREG directives in relation to stress tests, the CSN put in place the post-Fukishima National Action Plan (NACP), requiring Spanish nuclear facilities to implement measures to tackle situations beyond design basis.

In the case of fuel pools, the measures required, already implemented at all nuclear power plants, are aimed at improving instrumentation and making the capacity of residual heat assessment more robust. The following specific actions have been carried out:

- ✓ Strengthening of level and temperature of water instrumentation in the pools to maintain availability in the case of prolonged loss of electrical energy.
- ✓ Strengthening of systems providing additional refrigeration to the pools and portable electrical supply systems in the event of prolonged loss of electrical energy.
- ✓ The adoption of strategies for the redistribution of spent fuel ("chessboard" layout, with the hottest elements surrounded by colder elements).

The ITS facilities located at the Trillo and Ascó nuclear power plants, given that they form part of said facilities, are covered by the amendments implemented by the licensees to comply with the Complementary Technical Instruction (mandatory) issued to each facility after the accident at Fukishima to tackle situations beyond design basis (severe conditions) including the loss of large areas within the facility.

At the ITS at the José Cabrera nuclear power plant, which is in dismantling, the CSN required, through a specific instruction, the development of measures to guarantee the capacity for the handling and reconditioning of fuel in the event of unexpected failure and mitigation measures to respond to events with a potential loss of large areas.

After the accident at Fukishima, the European Commission initiated the stress tests process with subsequent peer review. Moreover, the European Commission has reviewed Directive 2009/74/Euratom, establishing a community framework for the nuclear safety of nuclear facilities, through Directive 2014/87/Euratom of 8 July 2014. The aforementioned Directive requires strict compliance[22] with the safety applicable to design, siting, construction, operation and dismantling of nuclear facilities that contained their construction authorisation subsequent to 14 August 2014. For this reason, said Directive is applicable to the Centralised Temporary Storage (CTS) facility which is currently in the assessment of construction authorisation phase.

[22] *For nuclear facilities with construction authorisation prior to this date, the safety objective of the Directive is considered a reference for the effective implementation of improvements in safety that are reasonably feasible in appropriate time.*

To such end, in February 2016 the CSN approved a Technical Instruction requiring the promoter, ENRESA, to implement improvements in the design of the facility to tackle "serious conditions" (beyond the design basis).

Annex G

Summary Matrix

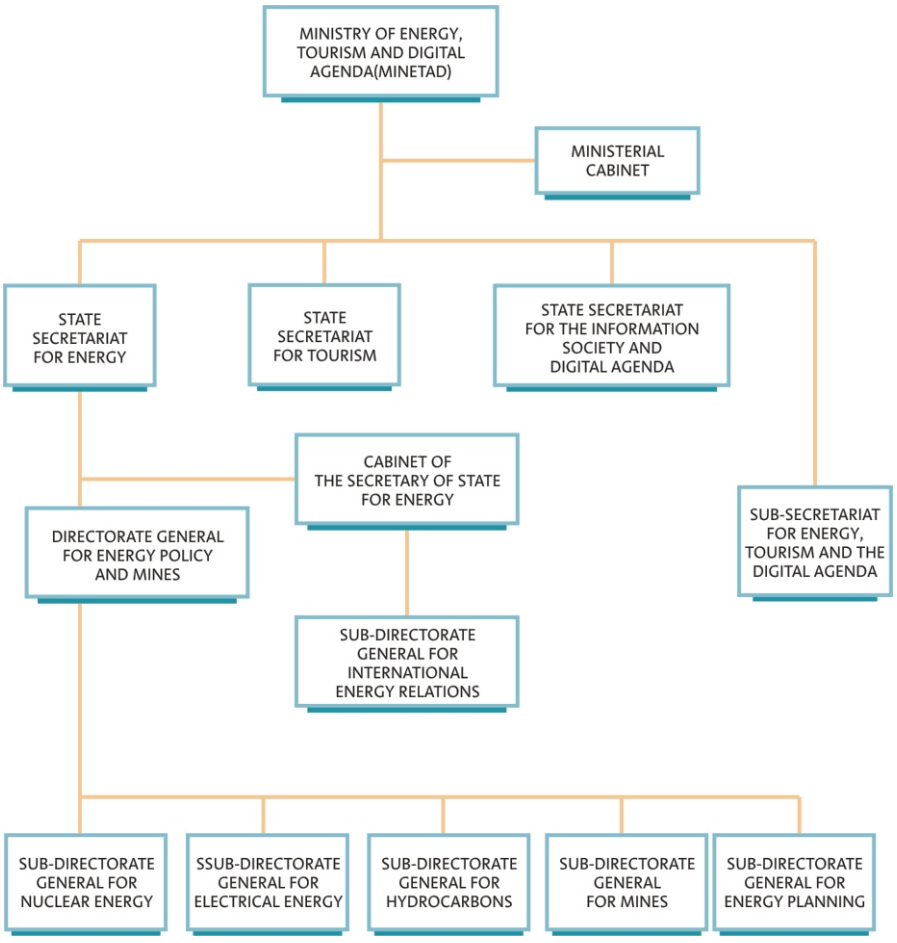
Type of responsibility		Long-term management policy	Financing	Current practices	Planned facilities
Spent fuel		Temporary storage for 60 years at CTS until availability of a disposal facility	"Polluter pays" principle. Fund for financing activities of GRWP. Income from NPPs in operation that have remained in operation in the year 2010 through the payment of "fee 2". Financing of the management of SF from NPPs closed prior to 2010 runs at the cost of "fee 1" (included in electricity rates).	At pools of the NPPs. Some ITSs.	CTS in the municipality of Villar de Cañas. Future disposal facility.
Waste from nuclear fuel cycle	Tailings of uranium mining	Facilities under monitoring programmes	Financing corresponds to the licensee of the facility or, in the case of historical legacy, imputed as "fee 1".	Conditioning and remediation on-site	N/A
	Waste from Juzbado	Disposal of LILW at El Cabril	"Polluter pays" principle. Fund for financing activities of GRWP. Income from Juzbado through payment of "fee 3".	Preconditioning and temporary storage at Juzbado. Transport, conditioning and disposal at El Cabril	N/A
	Operational waste from nuclear facilities	Disposal of LILW at El Cabril	"Polluter pays" principle. Fund for financing activities of GRWP. Income from operation of NPPs in operation that have remained in operation in the year 2010 through the payment of "fee 2".	Preconditioning and temporary storage at Juzbado. Transport, conditioning and disposal at El Cabril	N/A
	Waste from reprocessing of fuel from Vandellós 1 abroad	Temporary storage for 60 years at CTS until availability at a disposal facility	Fund for financing activities of GRWP. Income from "fee 1" (included in electricity rates).	Return to Spain once CTS available	CTS in the municipality of Villar de Cañas. Future disposal facility
Waste external to the fuel cycle		Disposal of LILW at El Cabril	"Polluter pays" principle. Fund for financing activities of GRWP. Income from operation licensees for RFs through payment of "fee 4"	Temporary storage at RFs. Preconditioning on-site. Transport, storage and disposal at El Cabril.	N/A

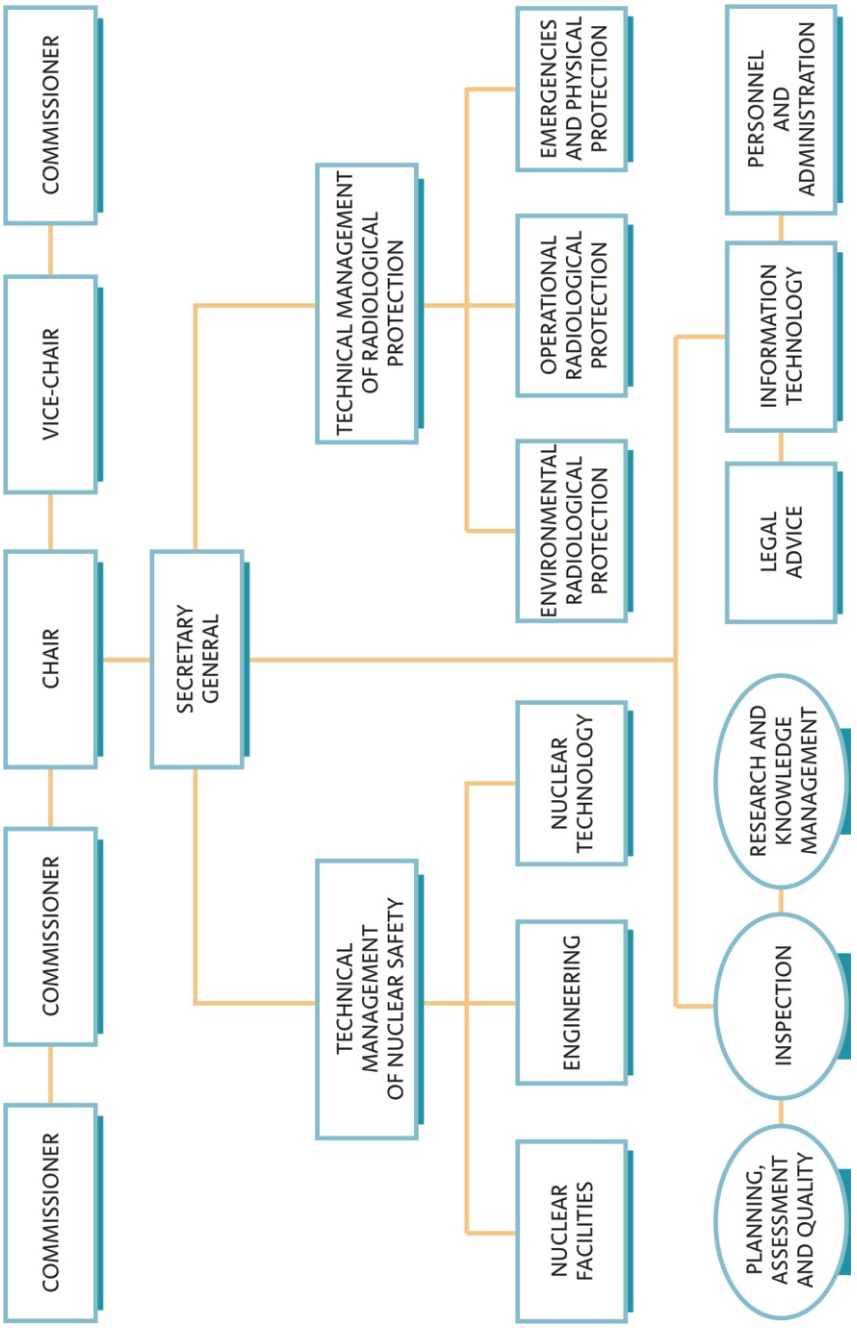
Type of responsibility	Long-term management policy	Financing	Current practices	Planned facilities
Decommissioning	Dismantling to green field. Resulting VLLW and LILW disposed at El Cabril. HLW and SW temporarily stored at CTS for a period of 60 years.	"Polluter pays" principle. Fund for financing activities of GRWP. Income from NPPs in operation that have remained in operation in the year 2010 through the payment of "fee 2". Financing of the management of SF from NPPs closed prior to 2010 runs at the cost of "fee 1" (included in electricity rates).	Immediate dismantling strategy for all light water reactors. Deferred strategy for Vandellós I	N/A
Used sealed sources	Return to supplier. If not possible, disposal at El Cabril. If acceptance criteria not met, temporary storage at El Cabril until the CTS is available. Then, disposal once available.	Cost assumed by licensee of the facility	Return to supplier. If not possible, disposal at El Cabril. If acceptance criteria not met, temporary storage at El Cabril until the CTS is available.	CTS in the municipality of Villar de Cañas. Future disposal facility.

Annex H

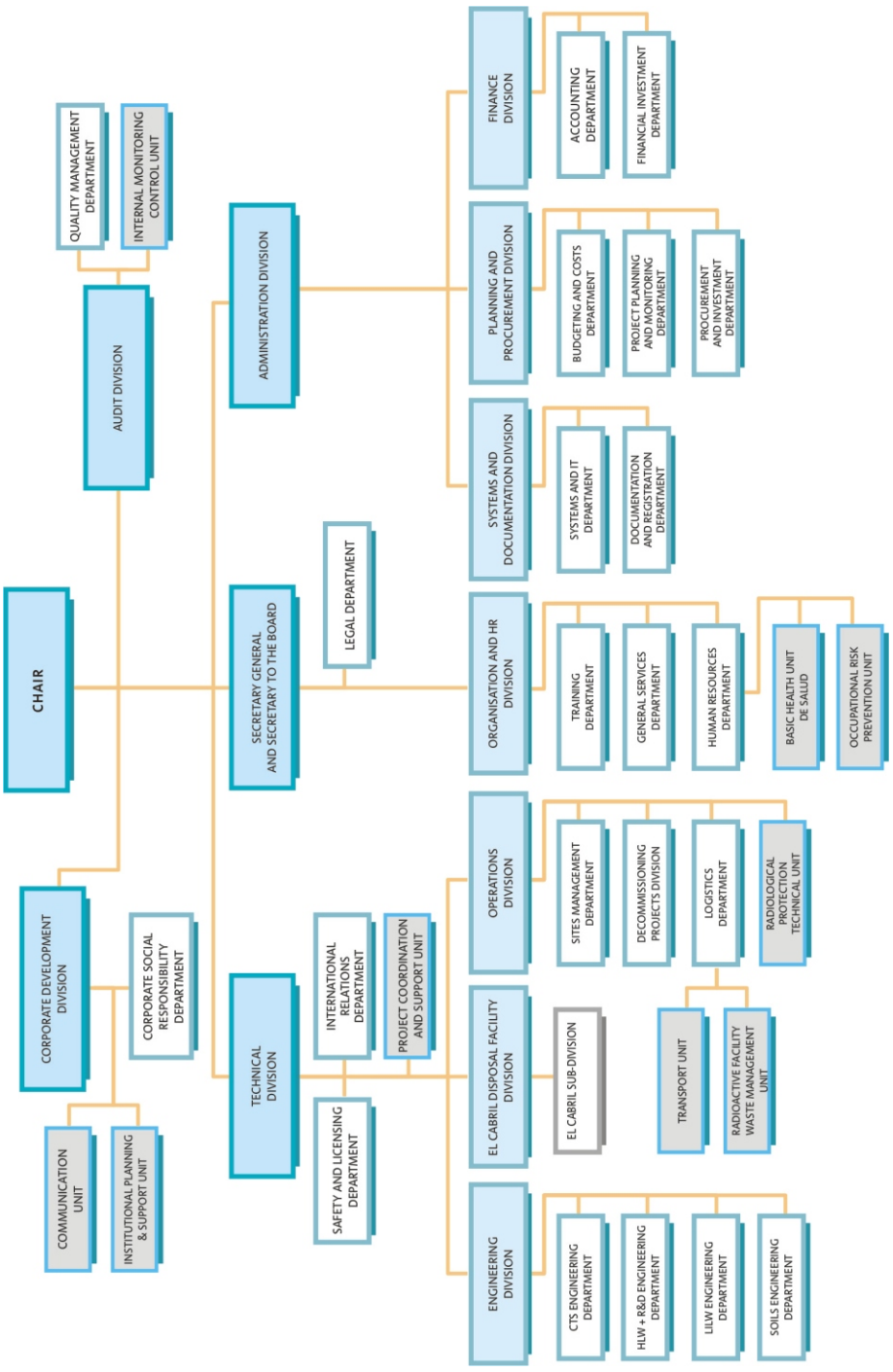
Organisational chart of bodies and institutions involved in radioactive waste and spent fuel management

1. Ministry of Energy, Tourism and the Digital Agenda (MINETAD)




COMMISSIONER
VICE-CHAIR
CHAIR
COMMISSIONER
COMMISSIONER
SECRETARY GENERAL
TECHNICAL MANAGEMENT OF RADIOLOGICAL PROTECTION
EMERGENCIES AND PHYSICAL PROTECTION
OPERATIONAL RADIOLOGICAL PROTECTION
ENVIRONMENTAL RADIOLOGICAL PROTECTION
TECHNICAL MANAGEMENT OF NUCLEAR SAFETY
NUCLEAR TECHNOLOGY
ENGINEERING
NUCLEAR FACILITIES
PERSONNEL AND ADMINISTRATION
INFORMATION TECHNOLOGY
LEGAL ADVICE
RESEARCH AND KNOWLEDGE MANAGEMENT
INSPECTION
PLANNING, ASSESSMENT AND QUALITY

3. ENRESA


CHAIR
AUDIT DIVISION
QUALITY MANAGEMENT DEPARTMENT
INTERNAL MONITORING CONTROL UNIT
CORPORATE DEVELOPMENT DIVISION
COMMUNICATION UNIT
INSTITUTIONAL PLANNING & SUPPORT UNIT
CORPORATE SOCIAL RESPONSIBILITY DEPARTMENT
SECRETARY GENERAL AND SECRETARY TO THE BOARD
LEGAL DEPARTMENT
TECHNICAL DIVISION
INTERNATIONAL RELATIONS DEPARTMENT
PROJECT COORDINATION AND SUPPORT UNIT
SAFETY AND LICENSING DEPARTMENT
ADMINISTRATION DIVISION
FINANCE DIVISION
ACCOUNTING DEPARTMENT
FINANCIAL INVESTMENT DEPARTMENT
PLANNING AND PROCUREMENT DIVISION
BUDGETING AND COSTS DEPARTMENT
PROJECT PLANNING AND MONITORING DEPARTMENT
PROCUREMENT AND INVESTMENT DEPARTMENT
SYSTEMS AND DOCUMENTATION DIVISION
SYSTEMS AND IT DEPARTMENT
DOCUMENTATION AND REGISTRATION DEPARTMENT
ORGANISATION AND HR DIVISION
TRAINING DEPARTMENT
GENERAL SERVICES DEPARTMENT
HUMAN RESOURCES DEPARTMENT
BASIC HEALTH UNIT DE SALUD
OCCUPATIONAL RISK PREVENTION UNIT
OPERATIONS DIVISION
SITES MANAGEMENT DEPARTMENT
DECOMMISSIONING PROJECTS DIVISION
LOGISTICS DEPARTMENT
RADIOLOGICAL PROTECTION TECHNICAL UNIT
EL CABRIL DISPOSAL FACILITY DIVISION
EL CABRIL SUB-DIVISION
TRANSPORT UNIT
RADIOACTIVE FACILITY WASTE MANAGEMENT UNIT
ENGINEERING DIVISION
CTS ENGINEERING DEPARTMENT
HLW + R&D ENGINEERING DEPARTMENT
LILW ENGINEERING DEPARTMENT
SOILS ENGINEERING DEPARTMENT

This page blank

Annex I

Initials and abbreviations used

AEMC	*Alternative Emergency Management Centre*
ALARA	*As low as reasonably achievable*
B.O.E.	*Official State Gazette*
BWR	*Boiling Water Reactor*
CFR	*United States Code of Federal Regulations*
CIEMAT	*Research Centre for Energy, Environment and Technology*
CSN	*Nuclear Safety Council*
CTS	*Centralised Temporary Storage*
DBRR	*Basic Directive on Civil Protection against Radiological Risk.*
DCP	*Design Change Package*
DGD	*Deep Geological Disposal*
DGPC	*Directorate General for Civil Protection*
DGPEyM	*Directorate General for Energy Policy and Mines*
EC	*European Commission*
ECURIE	*Urgent Radiological Information Exchange system of the European Union*
EIA	*Environmental Impact Assessment.*
ENRESA	*Empresa Nacional de Residuos Radiactivos, S.A. (Spanish Radioactive Waste Management Agency)*
ENUSA	*ENUSA Industrias Avanzadas, S.A.*
ERO	*Emergency Response Operation*
ESC	*Emergency Support Centre*
EURATOM	*European Atomic Energy Community*
FUA	*Andújar Uranium Factory*
GRWP	*General Radioactive Waste Plan*
HERCA	*Heads of the European Radiological Protection competent authorities*
HLW	*High Level Waste*
IAEA	*International Atomic Energy Agency*
ICRP	*International Commission on Radiological Protection*
INEX	*International Nuclear Emergency Exercise*
INPO	*Institute of Nuclear Operations*
IRRS	*Integrated Regulatory Review Service*
ISO	*International Organization for Standardization*

JEN	*Nuclear Energy Board*
KWU	*Kraftwerk Union A.G.*
LEN	*Nuclear Energy Act*
M.O.	*Ministerial Order*
MAPAMA	*Ministry of Agriculture, Fisheries, Food and the Environment*
MCDE	*Offsite Dose Calculation Manual*
MITYC/ MINETUR/ MINETAD	*now Ministry of Energy, Tourism and the Digital Agenda*
NEA-OECD	*Nuclear Energy Agency of the OECD*
NPP	*Nuclear Power Plant*
NRC	*United States Nuclear Regulatory Commission*
NUREG	*Technical publication of the NRC*
OECD	*Organisation for Economic Co-operation and Development*
OI	*Operating Instructions*
OSPAR	*Convention for the Protection of the Marine Environment of the North-East Atlantic*
OTS	*Operating Technical Specifications*
PCP	*Process Control Programme*
PEI	*Off-site Emergency Plan*
PEN	*National Energy Plan*
PERR	*State Plan for Civil Protection from Radiological Risk*
PIMIC	*Integrated Plan for the Improvement of CIEMAT Facilities*
PLABEN	*Basic Nuclear Emergency Plan*
PSR	*Periodic Safety Review*
PSS	*Preliminary Safety Study*
PVRA	*Environmental Radiation Monitoring Programme*
PWR	*Pressurised Water Reactor*
R.D.	*Royal Decree*
R.G.	*Regulatory Guide of the NRC*
R+D	*Research and Development*
RBMA	*Low and Intermediate Level Waste*
RF	*Radioactive Facility*
RINR	*Nuclear and Radioactive Facilities Regulation*
RPSRI	*Regulation on Health Protection against Ionising Radiation*
RWSFMP	*Radioactive Waste and Spent Fuel Management Plan*
SACOP	*Operational Coordination Room*
SALEM	*Emergency Room of the Nuclear Safety Commission*
SEPI	*State Industrial Ownership Corporation*
SF	*Spent fuel*

SFSP	*Spent Fuel Storage Pool*
SG	*Safety Guide*
SGEN	*Sub-directorate General for Nuclear Energy*
SS	*Safety Study*
SW	*Special Waste*
UKAEA	*UK Atomic Energy Authority*
UNESA	*Spanish Electrical Industry Association*
UPC	*Universidad Politécnica de Cataluña*
USA	*United States of America*
USNRC	*United States Nuclear Regulatory Commission*
VLLW	*Very Low Level Waste*
WANO	*World Association of Nuclear Operators*
WENRA	*Western European Nuclear Regulators Association*