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

Fifth Spanish National Report

October 2014

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Section A

Introduction

Section A. Introduction

A.1. Presentation of the report

This document constitutes the Fifth Spanish National Report, submitted in compliance with the requirements of Article 32 of the Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management, adopted in Vienna on 5 September 1997.

This report will be examined at the Review Meeting of the Contracting Parties as set out in Article 30 of the Convention, which will begin in May 2015. The preparation of the report involved the participation of the Spanish Ministry of Industry, Energy and Tourism (MINETUR), the Spanish Nuclear Safety Council (CSN) and the Spanish radioactive waste management agency Empresa Nacional de Residuos Radiactivos, S.A. (ENRESA). The report summarises the actions implemented mainly from 1 January 2011 to 1 June 2014, although the information and data included refer to that available as of 31 December 2013, unless expressly specified otherwise.

It is intended that this report is not merely an informative document but also of critical and evaluative use. In this respect, the criteria and guidelines used in drawing up the report have been as follows:

- ✓ The starting point for the preparation of the report was the IAEA document INFCIRC/604 'Guidelines regarding the Form and Structure of National Reports', adopted by the Contracting Parties in accordance with Article 29 of the Convention.
- ✓ Section A.3. briefly summarises progress since the Fourth National Report. This includes the actions pending outlined in Section K of the Fourth National Report and other actions resulting from the commitments made by Spain at the Fourth Review Meeting, with reference to the relevant articles of the Convention. Sections A, B, C and D should be self-explanatory, whilst the rest of the sections will describe only those developments or actions carried out in compliance with the articles of the Convention, with reference to the Annexes or previous National Reports in order to avoid duplication.
- ✓ Consideration has been given to the comments and suggestions issued during the process of reviewing the previous National Report. The reports by the Rapporteurs to the Plenary and the Summary Report of the Fourth Review Meeting were submitted to the Spanish Congressional and Senate Commissions on Industry, Energy and Tourism, and to the Institutions concerned.
- ✓ Section K mainly identifies aspects considered as requiring improvement and the measures planned in this respect.

The terminology of the Convention has been used throughout this report, except in those sections in which the corresponding details have been expressly indicated. (In the original Spanish version of this report, for the purposes of correspondence with Spanish standards, the term residuo radiactivo has been used in preference to the synonymous *desecho radiactivo* to refer to radioactive waste, as defined in Article 2 of this Convention.)

It should be pointed out that what the Convention refers to generically as 'nuclear facilities' corresponds in Spanish legislation, and throughout this report, not only to those facilities that are designated as 'nuclear facilities' in national law – i.e. nuclear power plants, nuclear reactors, nuclear fuel manufacturing facilities, facilities for the treatment of nuclear substances and facilities for the storage of nuclear substances – but also includes, for reasons of safety in radioactive waste management, 'radioactive facilities' that produce, handle or store radioactive material.

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

The spent fuel managed in Spain derives from the eight operating nuclear reactors located at six sites, including the Santa María de Garoña nuclear power plant, shut down since 2013, and the José Cabrera nuclear power plant, currently in the process of dismantling. In accordance with the Convention, these plants are also radioactive waste management facilities. There are also other nuclear facilities in operation: the Juzbado fuel manufacturing facility in Salamanca and the Sierra Albarrana (El Cabril) solid radioactive waste disposal facility in the province of Córdoba. Some of the obsolete facilities at CIEMAT (the Centre for Energy-Related, Environmental and Technological Research), in Madrid, are currently in the dismantling phase. In addition, radioactive waste may be generated as a result of the presence of radioactive sources and other materials in facilities or activities outside the regulatory system. Section B.3 details the origin of this fuel and waste.

Spain has the necessary infrastructure in place for the management of spent fuel and radioactive waste, from institutional, administrative, technical, and economic and financial standpoints. It has also established appropriate measures to ensure the public's rights of access to information and participation.

From an administrative point of view, the legal and regulatory framework for the management of spent fuel and waste is integrated in the general framework regulating nuclear energy in Spain. This is a broad framework developed in accordance with the evolution of international regulatory requirements. This framework clearly sets out the responsibilities of the various parties involved, as well as the distribution of functions among the competent authorities responsible for each area. Whilst these functions are carried out separately and independently, they are integrated and coordinated within a common administrative framework.

Firstly, and with specific regard to the management of spent fuel and radioactive waste, the Government is responsible for defining national policy through the approval of the General Radioactive Waste Plan (GRWP), on the proposal of the MINETUR. This Plan, which is revised periodically, sets out the main courses of action, the timeframe for their implementation, and the economic and financial estimates for this implementation. Likewise, the management of radioactive waste, including spent fuel and the dismantling and decommissioning of nuclear facilities, constitutes an essential public service for which the Spanish State is responsible. ENRESA is com-

missioned to manage this public service in accordance with the GRWP. The State will assume ownership of the radioactive waste once its definitive disposal is undertaken.

Secondly, the basic procedures of the regulatory framework for nuclear energy, setting out the distribution of administrative functions among the different competent authorities, are as follows:

✓ **Authorisation procedure**

The MINETUR is responsible for issuing authorisations for nuclear and radioactive facilities, except in the case of 2nd and 3rd category radioactive installations[1] when competence has been transferred to the Governments of the Autonomous Communities[2] as requested. Prior to granting any authorisation for a nuclear or radioactive installation, the MINETUR must request reports from all competent authorities involved. In the specific case of nuclear safety and radiological protection, the mandatory report issued by the CSNs binding both in the case of refusal and regarding limISFSI and conditions imposed if favourable.

The CSN is responsible for granting and revoking licences and accreditation for personnel involved in the operation of nuclear and radioactive facilities, as well as diplomas for personnel in the radiological protection services or technical units, as required. The CSNis also responsible for the granting and withdrawal of authorisations for Personal Dosimetry Services, Radiological Protection Services and Radiological Protection Technical Units.

The issuance of Environmental Impact Statements for relevant projects is the responsibility of the Ministry of Agriculture, Food and the Environment.

✓ **Legislative procedure**

The Government is responsible for approving the legislative development of laws approved by Parliament, whilst the MINETUR is currently the ministerial department responsible for processing and submitting legislative proposals in the field of nuclear energy. The preparation of proposals for regulatory developments relating to nuclear energy is coordinated between the MINETUR and the CSN. When proposals refer to matters that may concern nuclear safety or radiological protection, the initiative lies with the Nuclear Safety Council, which transfers proposals to the MINETUR for submission to the Government.

The Nuclear Safety Council is empowered to issue its own standards through the approval of CSNInstructions, which are technical standards relating to nuclear safety, radiological protection, emergencies and physical protection. These are incorporated in the internal legal system and are binding upon those within its scope of application once notified or published in the Official State Gazette. Non-compliance with these instructions is legally classified as an administrative offence punishable under the penalty system of Law 25/1964, the Nuclear Energy Act of 29 April (NEA). The CSNmay also issue Supplementary Technical Instructions, which are administrative proceedings binding upon those to whom they are issued. These aim to ensure the upholding of safety requirements and conditions in facilities and activities, and improved compliance with the requirements established in each authorisation. Finally, the CSNissues

[1] *As classified in R.D. 1836/1999 of 3 December, approving the Regulation on Nuclear and Radioactive Facilities, amended by R.D. 35/2008 of 18 January.*

[2] *The Spanish State is made up of seventeen Autonomous Communities, whose right to autonomy is set out in Art. 2 of the Spanish Constitution. The powers and competences of the Autonomous Communities are established in Art. 143 and the following articles of the Spanish Constitution.*

Circulars and Guides that are technical documents of an informative nature and non-binding technical recommendations, respectively.

✓ **Surveillance, monitoring and control procedure**

The review and assessment of nuclear safety and radiological protection at nuclear and radioactive facilities, and the inspection of these facilities are the responsibility of the CSN, as the sole competent body in matters of nuclear safety and radiological protection.

As regards other issues, such as security, emergency preparedness and environmental impact, the implementation of these procedures is carried out in coordination with the agencies of other ministerial departments with relevant competence.

✓ **Penalty proceedings**

The MINETUR Directorate General for Energy Policy and Mines is responsible for processing penalty proceedings against nuclear and radioactive installations, except 2nd and 3rd category installations for which competence has been transferred to the Governments of the Autonomous Communities. It is also responsible for submitting penalty proposals to the relevant authority as determined by legislation, depending on the seriousness of the offence.

When offences are related to issues involving nuclear safety or radiological protection, the initiative lies with the CSN, which proposes initiation of the corresponding proceedings to the MINETUR. As regards physical protection, the CSN may also propose the institution of penalty proceedings for offences against the nuclear regulatory framework.

In addition, under certain circumstances stipulated in the NEA, the CSN is legally empowered, instead of proposing the institution of penalty proceedings to the MINETUR, to issue warnings to licensees, stating the corrective measures to be implemented by the licensee. If this requirement is not met, the CSN may impose coercive fines in accordance with the procedure established for this purpose in the legislation.

With regard to the technical, economic and financial infrastructure for the management of radioactive waste, as stated above, ENRESA is the company authorised in Spain to provide services for the storage, disposal, transport and handling of radioactive waste and spent nuclear fuel. This company, entirely public in nature, was set up by Royal Decree in 1984 and its shareholders are SEPI (the State Industrial Holdings Corporation), a public law entity attached to the Spanish Ministry for Finance and Public Administrations, and CIEMAT, a national research centre reporting to the Ministry of the Economy and Competitiveness. ENRESA operates under the aegis of the MINETUR, through the Secretariat of State for Energy, which undertakes the strategic management, monitoring and control of its technical and economic actions and plans.

Besides activities specific to the management of spent fuel and radioactive waste and the dismantling of nuclear facilities, ENRESA fulfils other tasks. These include drawing up the drafts of the general radioactive waste plans, which are subsequently sent to the MINETUR for review and submission to the Government, and the administrative and financial management of the Fund for the financing of activities included in the GRWP, under the supervision of a Fund Monitoring Committee and the competent economic and financial authorities of the State Administration. Detailed information on ENRESA's functions can be found in Article 19.2, on the approval of the new Royal Decree 102/2014 of 21 February on the responsible management of spent nuclear fuel and radioactive waste.

Lastly, waste producers are responsible for the safe operation of their facilities and activities in compliance with the requirements of the official documents, and for any issues that might affect the conditions of their authorisation, safety and radiological protection and, in general, compli-

ance with the regulations in force. Likewise, producers are responsible for their facilities in any emergency situations that might arise.

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

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

Section K of the Fourth National Report outlined planned actions for the improvement of safety in relation to the safe management of radioactive waste and spent fuel in Spain. These included: the adoption of a new Royal Decree on Physical Protection applicable to nuclear facilities and material; the designation by the Government of a site for the construction of a Centralised Temporary Storage facility (CTS); the adoption of measures derived from the recommendations of the IAEA's IRRS (Integrated Regulatory Review Service) mission; and the review of safety implications applicable to nuclear facilities derived from the Fukushima accident. The development status of these initiatives was updated during the presentation of the Report in the Fourth Review Meeting of the Convention. Consequently, it was also requested that the Fifth National Report take into account the progress made in the following: developments to ensure timely pro-

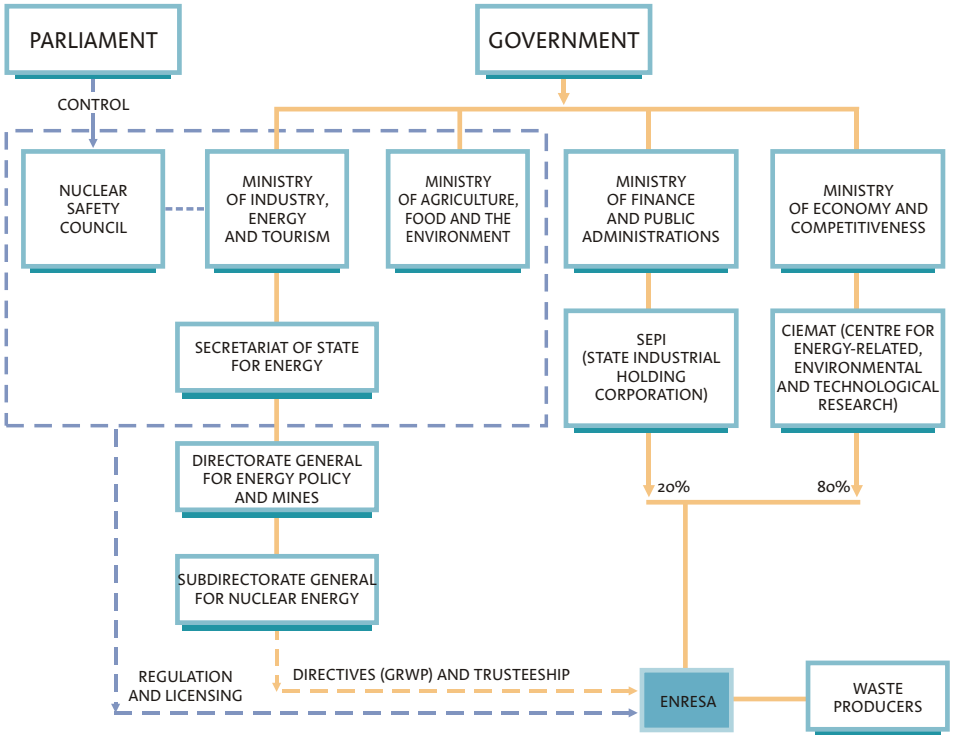

Figure 1. National system.

vision of additional temporary storage capacity for spent fuel in the pools at the nuclear power plants where saturation is predicted; the long term management of disused sealed sources with a long half-life; dismantling activities at the Saelices el Chico (Salamanca) uranium milling facilities; and the analysis of loss of large areas as a consequence of explosions or fire, particularly for nuclear power plants in the process of dismantling.

Although these matters are dealt with in depth in various sections of this Report, the most important examples of progress in these areas, and other developments in the management of radioactive waste and spent fuel, or relevant to this management are underlined below.

a) Principal developments in the existing regulatory framework, which may be found in Annex A.

i) Council Directive 2011/70/Euratom of 19 July 2011 establishing a Community framework for the responsible and safe management of spent fuel and radioactive waste (previously described in the Fourth National Report) has been recently transposed into the Spanish legal system by means of Royal Decree 102/2014 of 21 February on the responsible management of spent nuclear fuel and radioactive waste. The transposition was partial, since a large part of the Directive's content was already incorporated in the legislation at various levels, and particularly in relation to legislation on nuclear safety, the licensing system, the General Radioactive Waste Plan (GRWP), the control system and the funding of management activities.

This Royal Decree is not limited to transposing the Directive but also updates the precepts of Royal Decree 1349/2003 of 31 October on the regulation of the Spanish radioactive waste management agency ENRESA's activities and funding, now repealed.

The main developments included in Directive 2011/70/Euratom and Royal Decree 102/2014 are outlined in Articles 19.1 and 19.2 respectively of this Report.

ii) Similarly at European level, during the period covered by the Report, Council Directive 2013/59/Euratom of 5 December 2013 was adopted, laying down basic safety standards for protection against the dangers arising from exposure to ionising radiation, and repealing the following Directives:

- ✓ 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.

Directive 2013/59/Euratom is the result of the amendment and reworking of these five directives, now repealed, laying down basic safety standards for protection against the dangers arising from exposure to ionising radiation, applicable to individuals subject to occupational, medical and public exposure. The Directive applies to

any planned, existing or emergency exposure situation which involves a risk from exposure to ionising radiation which cannot be disregarded from a radiation protection point of view or with regard to the environment. The Directive sets out a time limit of four years for its transposition into the national legal system. More detailed information on this directive may be found in Article 19.1 of this Report.

iii) Law 15/2012 of 27 December on fiscal measures for sustainable energy, amended by Law 16/2013 of 29 October, introduced as of 1 January 2013 two new state-level taxes which tax firstly the production of spent nuclear fuel and radioactive waste and secondly its storage and disposal in centralised facilities. From a practical point of view, the licensees of the nuclear power plants are liable for the tax on production and ENRESA, as licensee of the El Cabril Centralised Disposal facility for low and intermediate level waste, is liable for the tax on storage and disposal. The tax on storage and disposal will also apply to the planned Centralised Temporary Storage facility (CTS), once spent nuclear fuel or radioactive waste is received at the facility. This is detailed in Article 19.1 of this Report.

iv) Law 21/2013 of 9 December on environmental assessment, in force since 12 December 2013, unifies the legal framework on environmental assessment of plans and programmes and the legal framework on environmental assessment of projects, regulated until then by two different provisions, now repealed: Law 9/2006 of 28 April on the assessment of the effects of certain plans and programmes on the environment; and Royal Legislative Decree 1/2008 of 11 January approving the reworked text of the Law on environmental impact assessment of projects. Similarly incorporated into the Spanish legal system was Directive 2011/92/EU of 13 December on the assessment of the effects of certain public and private projects on the environment. More detailed information on this law can be found in Article 19.1 of this Report.

v) The adoption of Royal Decree 1308/2011 of 26 September on the physical protection of facilities, nuclear materials and radioactive sources. This new Royal Decree arises from the need to update Royal Decree 158/1995, which it repeals, fundamentally due to the 2005 amendment of the Convention on the Physical Protection of Nuclear Material and Nuclear Facilities, under the auspices of the IAEA, the creation of the Global Initiative to Combat Nuclear Terrorism (GICNT) and Resolution 1540 of the UN Security Council.

   Its most important contribution is the enhancement of the existing physical safety system in Spain, defining the concepts which are used in the physical safety systems for nuclear facilities and materials. It reinforces the regulation of protection measures for these materials and above all to prevent the sabotage of facilities, the protection of significant radioactive sources, the management of illicit traffic events, the delimitation of powers between authorities and the protection of information regarding physical safety. The content of this Royal Decree is detailed in Article 19.2 of this Report.

vi) Additionally, incorporated into the Regulation on Nuclear and Radioactive Facilities (RNRF)[1] is a new authorisation for the dismantling and closure of definitive disposal facilities for spent nuclear fuel and radioactive waste, detailed in Article 19.4. This includes the obligation to provide proportionate guarantees covering the costs and contingencies which may arise from the processes of dismantling and de-

[1] *Approved by Royal Decree 1836/1999 of 3 December and amended by Royal Decree 35/2008 of 18 January, Royal Decree 1308/2011 of 26 September and Royal Decree 102/2014 of 21 February.*

commissioning or closure of radioactive facilities from the period when resources were not covered by the Fund for the financing of activities included in the General Radioactive Waste Plan, detailed in Article 22.2.

vii) Similarly, Final Disposition 2 of Royal Decree 1308/2011 of 26 September introduces an amendment to the RNRF concerning required conditions for workers in the performance of their tasks in nuclear or radioactive facilities and controls to which they may be subject in order to ensure nuclear safety. Additional information may be found in Article 21.1 of this Report.

viii) Lastly, during the indicated period, the CSN has approved the following Instructions: IS-31 of 26 July 2011 on criteria for radiological control of waste materials generated in nuclear facilities; IS-34 of 18 January 2012 on criteria relating to measures for radiological protection, reporting of nonconformities, availability of persons and resources in emergencies and load monitoring during the transport of radioactive material; and IS-35 of 4 December 2013 concerning the treatment of design modifications of transport packages for radioactive material with a certificate of approval of Spanish origin and of physical or operational modifications to packages carried out by the sender. Details of these Instructions may be found in Section 19.4 of this Report.

b) Status of the Centralised Temporary Fuel Storage (CTS) facility.

By means of the Council of Ministers' Agreement of 30 December 2011, the Government approved the designation of Villar de Cañas (Province of Cuenca) as the chosen municipality for the location of the Centralised Temporary Storage facility for spent nuclear fuel and high level waste and its associated Technological Centre. This was in accordance with a bill from the Commission for Industry, Tourism and Trade of the Lower House of the Spanish Parliament of April 2006, calling on the Government to designate the location and complete the process of site selection, as detailed in the Fourth National Report.

In September 2012, ENRESA acquired the land for the site of the CTS and in January 2013, the adjacent plots for the location of the business incubator. Subsequently, in October 2012, ENRESA began site characterisation, which will continue until the startup of the facility, forecast for 2018. In August 2013, the Environmental Impact Assessment (EIA) procedure for the CTS facility was initiated, by means of ENRESA's presentation of the Scoping Document, which determines the content and extent of the Environmental Impact Study (EIS), to the Ministry of Agriculture, Food and the Environment. Meanwhile, between September 2012 and July 2013, ENRESA reached an agreement on collaboration with the necessary Public Administrations (the Regional Government of Castile-La Mancha, the Provincial Council of Cuenca and the corresponding local councils) for improving road access to the site. Finally, in January 2014, ENRESA submitted authorisation applications for the siting and construction of the CTS nuclear facility to the MINETUR, as required by the RNRF. In turn, the MINETUR requested the binding report from the Nuclear Safety Council corresponding to both applications. More detailed information on the licensing process for the CTS and progress on its construction can be found in Articles 6, 7 and 8 of this Report. The general licensing process is detailed in Annex B.

c) Measures deriving from the recommendations of the IAEA IRRS mission.

In February 2011, Spain hosted a follow-up mission to the IRRS (Integrated Regulatory Review Service) mission carried out by the International Atomic Energy Agency (IAEA) in Spain in 2008.

The follow-up mission focused on the progress made by Spain in responding to the recommendations and suggestions of the IRRS mission of 2008 and on the review of those areas that had changed significantly since that time. In the area of waste, two suggestions were finalised (concerning the involvement of the Nuclear Safety Council in the development and approval of the General Radioactive Waste Plan, and the establishment of a national inventory of radioactive waste), one recommendation was modified (concerning the definitive disposal of spent fuel and high level waste) and a best practice was determined (concerning the process implemented for the Centralised Temporary Storage facility site selection).

The outcomes of the IRRS follow-up mission are summarised in Annex D.

d) Safety implications of Fukushima Daiichi NPP accident.

Following the accident at Fukushima, in 2011 the CSN issued a series of Supplementary Technical Instructions (STIs) requiring licensees to carry out a supplementary safety analysis taking into account beyond design basis events. Similarly, the CSN actively participated in the European nuclear power plant stress test process, which included an exhaustive review procedure for EU-wide results. The improvements in safety arising from the lessons learned from Fukushima, identified during these and other national and international activities, were included in a National Action Plan, defined at the end of 2012. In 2013, ENSREG designed and carried out a peer review exercise on the national action plans.

It is worth mentioning that, complementary to the agreed scope for the stress tests, the CSN issued a Supplementary Technical Instruction for improving the protection of the plants against other extreme events of human origin, which could cause the loss of large areas of facilities and impact seriously on their safety or on the environment and public health.

Annex C contains detailed information on the post-Fukushima National Action Plan and ISFSI content, particularly on specific measures for improvement of the safety of the pools for the temporary storage of spent fuel. Likewise, Annex D briefly outlines the results of the peer review of the national action plans from across the EU.

e) Developments to ensure timely provision of additional temporary storage capacity for spent fuel in the pools at nuclear power plants where saturation is predicted.

Before the CTS comes into operation, the Ascó and Santa María de Garoña nuclear power plants will need additional storage capacity besides their pools. Both have applied for the construction of on-site Independent Spent Fuel Storage Installation (ISFSIs)

The MINETUR Directorate General for Energy Policy and Mines authorised the commencement of operation of the Ascó ISFSI in April 2013, after which the first loading and transfer of irradiated fuel casks from Unit 1 to the ISFSI took place.

The Santa María de Garoña plant requested authorisation for the construction of its ISFSI in August 2013, and this is currently undergoing assessment by the CSN.

Further information on both licensing processes may be found in Articles 6, 7 and 8 of this Report.

f) Developments in the long term management of disused sealed sources with a long half-life.

As indicated in previous reports, Spain continues to develop various initiatives to complete the framework of actions for disused sealed sources. The basis of the current system of source management is return to the supplier via a contractual agreement

undertaken at the time of the application for authorisation for use, provided this return is possible at the time when the source ceases to be useful (Article 28 of this Report).

This strategy cannot be applied in some cases either because the supplier has ceased to exist or because their identification is not possible (orphan sources deriving from past applications or from sources in disuse that are outside regulatory control and whose supplier cannot be located). In these situations, Spanish regulations, aligned with European Union provisions and the various IAEA standards and recommendations, provide sufficient cover to ensure the physical and radiological safety of these materials. Specifically, this requires that after ensuring their isolation, characterisation and safe situation and after notifying the CSN, the sources may be delivered to ENRESA for management.

For medium and long term management, ENRESA distinguishes between sources which contain mainly short lived radioisotopes, generally with overall low activity levels, and those composed of long lived elements, in many cases with high activity levels.

- ✓ The first are subject to definitive disposal at the El Cabril disposal facility, after due treatment and conditioning.
- ✓ The second are currently stored in temporary storage facilities at El Cabril. ENRESA has nevertheless already presented a proposal for the 7th Spanish General Radioactive Waste Management Plan (GRWP) which plans in these cases to effect intermediate storage or management in the Centralised Temporary Storage facility (CTS), which is currently in the licensing phase. If the proposal is approved, the sources will be stored in an ad hoc building for this waste and other long lived waste. Also in accordance with this proposal, final management will be carried out through disposal in a suitable geological formation together with the remainder of the long lived waste (spent fuel, high level waste and other long lived waste).

g) Dismantling activities at the uranium milling facilities at Saelices el Chico (Salamanca).

By Resolution of the Directorate General for Energy Policy and Mines of 30 October 2012, ENUSA Industrias Avanzadas S.A., the licensee of this facility, was required to submit a new application for authorisation for dismantling within one year. This was presented correctly within the time limit and is currently undergoing assessment by the Nuclear Safety Council. Section D.5 gives more in-depth information on this licensing process.

Section B

Policies and Practices

Section B. Policies and Practices

This section comprises the obligations set out in Article 32.1 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. The 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 strategy and policy for the management of radioactive waste and spent fuel

In accordance with Article 38a of Law 25/1964, the Nuclear Energy Act of 29 April (NEA), the Government is responsible for setting out the national programme and policy on radioactive waste management, including spent nuclear fuel, and the dismantling and decommissioning of nuclear facilities, through the approval of the General Radioactive Waste Plan (GRWP).

To enable the safe and responsible management of spent nuclear fuel and radioactive waste, in accordance with Royal Decree 102/2014 of 21 February, this Plan must include strategies, requisite actions and technical solutions for Spain in the short, medium and long term, aimed at the safe and responsible management of spent nuclear fuel and radioactive waste, the dismantling and decommissioning of nuclear facilities and all remaining activities related to the above, including the economic and financial projections and the measures and instruments necessary for their implementation.

The Plan is drawn up by ENRESA and submitted to the Ministry of Industry, Energy and Tourism. Subsequent to a Nuclear Safety Council report and input from the Autonomous Communities as regards land usage management, industry and social partners, as well as from the general public via the MINETUR website, the Ministry submits the Plan to the Government. The draft of the next GRWP will also be subject to the proceedings of the Strategic Environmental Assessment of Plans and Programmes, in accordance with Law 21/2013 of 9 December on environmental assessment. Following Government approval, the Plan is submitted to Parliament.

In accordance with current legislation, this Plan is regularly revised, taking into account technical and scientific progress, and experience acquired, as well as recommendations, lessons and best practice arising from the processes of peer review. It is the frame of reference for national strategies for the management of spent fuel and radioactive waste.

For the purposes of verifying GRWP compliance, ENRESA must prepare and submit the following to the MINETUR, which undertakes the strategic management, monitoring and control of ENRESA's technical and economic actions and plans:

a) Within the first six months of each year, a report including technical and economic aspects corresponding to the previous year's activities, and the degree of compliance with the relevant budget, in addition to an updated economic and financial study of the cost of the activities set out in the GRWP, and the adjustment of this cost to the current financial mechanisms.

b) Before 30 November of each year, a technical and economic budget justification for the following year, along with the projection for the four following years.

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

Furthermore, during the first quarter of each year, ENRESA must prepare information on the activities carried out during the previous year and the projections for the current year according to the provisions of the GRWP. This is submitted to the Nuclear Safety Council, responsible for the control of safety of the management of spent nuclear fuel and radioactive waste and the undertaking of assessments and inspections of the plans, programmes and projects necessary for all phases of this management.

Although the 6th Plan, approved by the Council of Ministers on 23 June 2006, is still in force, ENRESA has already presented a proposal for the 7th GRWP. This is intended to update and adjust the content to fully comply with the requirements of Royal Decree 102/2014, transposing Directive 2011/70/Euratom.

In order for ENRESA to carry out its activities relating to the management of radioactive waste and spent fuel, the licensees of nuclear and radioactive facilities are obliged to subscribe to technical administrative specifications approved by the Ministry of Industry, Energy and Tourism, subsequent to a Nuclear Safety Council report defining the conditions of receipt of the waste. The specifications set out the period of enforcement, which extends until the end of the facilities' life, including dismantling and decommissioning or closure of nuclear facilities and, when applicable, radioactive facilities.

ENRESA's activities are regulated by Royal Decree 102/2014 (see Article 19.2), and the Fund for the financing of activities included in the GRWP is regulated by Additional Provision 6 of Law 54/1997, the Electricity Industry Act of 27 November, made effective by Law 24/2013 of 26 December (see Annex F).

B.2. Classification of radioactive waste

The concept of radioactive waste is defined in Article 2 of the NEA:

> *'Radioactive waste' is any waste material or product for which no further use is foreseen and which contains or is contaminated with radionuclides in concentrations or activity levels in excess of those established by the Ministry of Industry and Energy, subject to report from the Nuclear Safety Council.*

Waste is categorised in Spain along the lines of the categorisation of management facilities, which are authorised for a determined volume, radiological inventory and certain limits of concentrations of activity according to the nature of the different radionuclides present. In practice, the different categories of facility are assimilable with the classification criteria for radioactive waste adopted by the IAEA[1] and the European Commission[2]:

- ✓ Low and Intermediate Level Waste (LILW) includes waste whose activity is due mainly to the presence of beta- or gamma-emitting radionuclides with short or intermediate half-lives (less than 30 years), and whose content of long lived radionuclides is very low and limited. This group comprises waste that may be temporarily stored, treated, conditioned and definitively disposed of at the El Cabril facilities (Córdoba), including the sub-category of Very Low Level Waste (VLLW).
- ✓ Special Waste (SW), in accordance with Nuclear Safety Council Instruction IS-29 on safety criteria in temporary storage facilities for spent fuel and high level radioactive waste, includes the following: nuclear fuel attachments; neutron sources; used in-core instrumentation or substituted components deriving from the reactor vessel system and reactor internals, generally metallic and presenting a high level of radiation through neutron activation; and other waste which, because of its radiological characteristics, is not eligible for management in the existing near surface level definitive disposal facility for LILW in Spain. Its management is connected to that of High Level Waste.
- ✓ High Level Waste (HLW) is waste that contains long lived alpha emitters with half-lives of more than 30 years in appreciable concentrations that generate heat as a result of radioactive decay, due to their high specific activity. The primary component of this waste is spent fuel (SF) discharged from nuclear reactors and considered as waste in accordance with Spanish policy. It is currently stored in pools in nuclear power plants and in the Independent Spent Fuel Storage Installation (ISFSI) facilities belonging to some of them. Storage in the Centralised Temporary Storage facility (CTS) is planned once it becomes operational.

B.3. Generation of spent fuel and radioactive waste

In Spain radioactive waste has been and is currently generated in nuclear facilities and radioactive facilities distributed throughout the country, as can be seen in Figure 2. Occasionally, waste may be generated as a result of specific activities (incidents).

The origins of the waste currently produced are as follows:

- ✓ Operation of nuclear power plants (eight reactors, including the Santa María de Garoña plant that is currently non-operational);
- ✓ Operation of the Juzbado Fuel Assembly Manufacturing Facility (Salamanca);
- ✓ Operation of radioactive facilities for industrial, medical, agricultural and research purposes;
- ✓ Operation of the El Cabril definitive disposal facility;

[1] *Safety Series No. GSG-1 Classification of Radioactive Waste General Safety Guide (IAEA, Vienna, 2009).*

[2] *Commission Recommendation of 15 September 1999 on a classification system for solid radioactive waste, 1999/669/EC, Euratom.*

Figure 2. Location of reactors and other facilities generating radioactive waste.

- ✓ Reprocessing in France of the spent fuel from the Vandellós I nuclear power plant;
- ✓ Dismantling of the Vandellós I and José Cabrera nuclear power plants;
- ✓ Dismantling of the obsolete and disused facilities at the Centre for Energy-Related, Environmental and Technological Research (CIEMAT);
- ✓ Occasional incidents.

In Spain, significant quantities of tailings from uranium mining and the manufacturing of uranium concentrates have also been produced (around 75 million tons of mining tailings and some 14 million tons of mill tailings). These have a low level of radioactivity, occasionally requiring specific management actions. In the majority of cases to date, on-site stabilisation has been the preferred method of management.

With the aim of estimating the volumes of waste expected to be generated as a result of the operation of the current fleet of nuclear facilities, the 6th GRWP currently in force takes into consideration the following reference scenario (see Figure 3):

- ✓ Current nuclear fleet with six nuclear power plants (eight reactors) and installed electrical power of 7.7 GWe, as of 31 December 2013.
- ✓ 40 years of useful life of the nuclear power plants in operation.
- ✓ Open fuel cycle. Reprocessing is not considered an option.
- ✓ Complete dismantling strategy (for light water nuclear power plants, to be initiated three years after definitive shutdown. In the case of the Vandellós I nuclear power plant, complete dismantling after the dormancy period.

According to the estimates as of 31 December 2013, the total volume of radioactive waste to be managed in Spain, already conditioned and eligible for definitive disposal at the El Cabril Disposal Facility, amounts to 181,093 m^3.

Table 1: Quantity of radioactive waste for management in Spain.

	VLLW/LILW (m^3)	SW (m^3)	SF (tU)	HLW (m^3)
NUCLEAR POWER PLANTS	159,928	447	6,704	12
NUCLEAR FUEL MANUFACTURE	1,218	0	0	0
RADIOACTIVE AND OTHER FACILITIES	19,947	408	0	0
TOTAL	181,093	855	6,704	12

Furthermore, waste stored at the CTS would rise to some 855 m^3 of SW, 6,704 tU of spent fuel and 12 m^3 of HLW as a result of Vandellós I reprocessing.

From these quantities, the waste resulting from the reprocessing of spent fuel from the Vandellós I nuclear power plant remains in France, with 12 m^3 of vitrified high level waste and 4 m^3 of special waste of various types currently pending return to Spain.

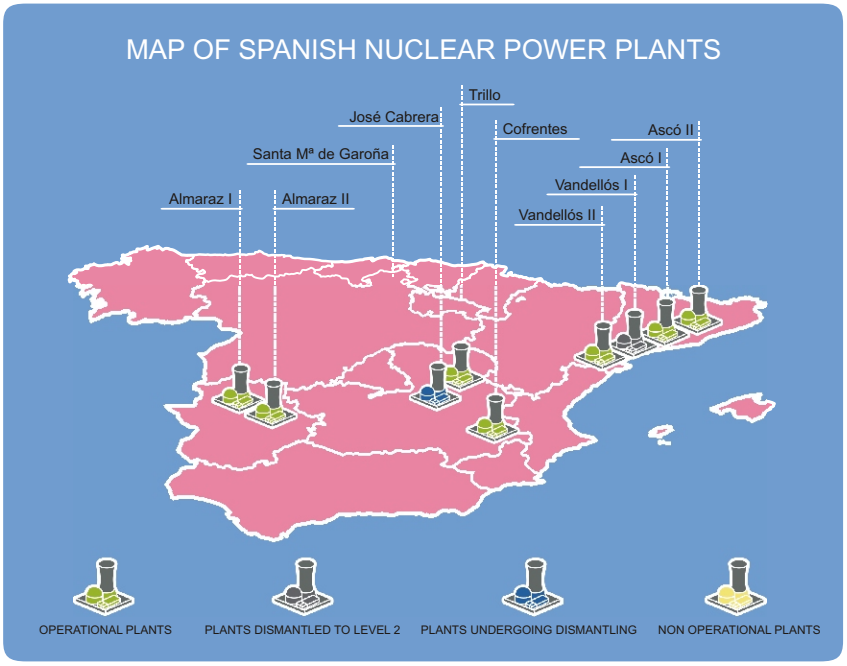

Figure 3. Nuclear power plants in Spain.

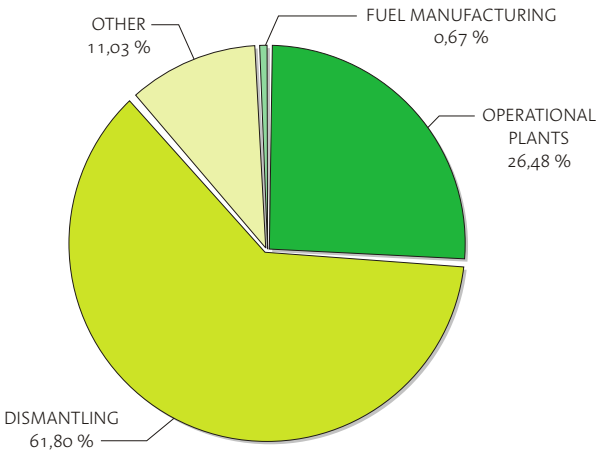

Figure 4. Quantity and origin of LILW in Spain.

As regards mining tailings and production of uranium concentrates, there are currently no operational facilities in Spain, with some facilities undergoing restoration and others already restored. A detailed view of the tailings and concentrates associated with each facility may be found in Section D (Inventories and lists).

B.4. Spent fuel management policies and practices

The 6th GRWP currently in force makes a clear distinction between spent fuel and high level waste and establishes that open cycle management is considered the basic option for spent fuel.

B.4.1 Temporary storage

The objective of temporary storage is to provide sufficient capacity to house the spent fuel generated by Spanish nuclear power plants until such time as a definitive solution becomes available.

The spent fuel from the light water plants in the Spanish nuclear fleet is currently stored in the pools of the corresponding plants. In view of the projected saturation of the storage capacity of these pools, the original racks were progressively replaced throughout the 1990s with other more compact units, which has enabled the significant deferral of the need to provide additional storage capacity to that of the pools in most cases.

Certain Spanish nuclear power plants, however, already have Independent Spent Fuel Storage Installations (ISFSI) facilities in place as an alternative or supplement to storage in the plant pools:

- ✓ Due to the limits imposed by the intrinsic characteristics of its design, the Trillo nuclear power plant was the first to have a facility of this type constructed on-site. This is a dry storage facility, in operation since 2002, where the spent fuel is stored in metallic casks.

The Independent Spent Fuel Storage Facility at the Trillo nuclear power plant.

- ✓ The José Cabrera nuclear power plant, undergoing dismantling since 2010, has had an on-site ITS facility since 2008. The 377 spent fuel assemblies from the plant are stored here in casks. Subsequently, on 25 April 2013, a design modification of the plant was authorised to enable this spent fuel storage facility to house an additional 4 casks containing reactor internals, considered SW since due to their characteristics they may not be stored at the El Cabril disposal facility. Further information on this modification may be found in Article 13.
- ✓ To prevent saturation of the fuel pools at the Ascó nuclear power plant, as of April 2013, on-site ISFSI facilities have been operational for each unit. Its licensing process, detailed in Articles 6, 7 and 8 of this Report, has required approval for the design of the cask, in accordance with Article 80 of the RNRF, and authorisations for construction and the commencement of operation of the modification, in accordance with Article 25 of the Regulation on Nuclear and Radioactive Facilities[1] (RNRF).
- ✓ Finally, the Santa María de Garoña nuclear power plant will require, until the commencement of operation of the CTS, additional storage capacity, for which an on-site ISFSI facility is planned, which will house the older fuel assemblies. Its licensing process requires, like those above, approval for the design of the cask, in accordance with Article 80 of the RNRF, which has already been requested, and authorisation for construction, also undergoing assessment. The licensing process for the ITS facility at Santa María de Garoña is detailed in Articles 6 and 7 of this Report.

The characteristics of the above facilities are detailed in Section D.1 of this Report.

The basic strategy set out in the GRWP for provision of additional capacity for the temporary storage of spent fuel focuses on the construction of a Centralised Temporary Storage (CTS) facil-

[1] *Approved by Royal Decree 1836/1999 of 3 December and amended by Royal Decree 35/2008 of 18 January, Royal Decree 1308/2011 of 26 September and Royal Decree 102/2014 of 21 February.*

The José Cabrera Nuclear Power Plant ISFSI facility.

ity to house spent fuel, HLW and SW using a dry storage system. This solution is supported by the following considerations:

- ✓ It enables management under optimum conditions and in a unified manner for all SF, HLW and SW, while keeping temporary management independent of definitive management.
- ✓ It provides the Spanish management system with room to manoeuvre in response to future contingencies, such as the need for the premature dismantling of a plant.

Ascó Nuclear Power Plant ITS facility.

- ✓ It reduces the number of SF, HLW and SW storage facilities in Spain, and consequently the number of nuclear sites spread throughout the country, with the corresponding reduction of the risks and obligations associated with this type of facility. This reduction should become more significant over time and is particularly important in relation to the physical security of facilities.
- ✓ It allows the decommissioned nuclear facility sites to be released for other unrestricted uses.
- ✓ It enables compliance with the clauses on the return of waste and materials from the reprocessing of SF abroad.
- ✓ From an economic point of view, it implies a highly significant reduction of the overall cost of the HLW and SW temporary management system, compared to the option of storage at each plant and the other necessary temporary storage facilities.
- ✓ It enables the rationalisation and optimisation of operation and support services.

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

B.4.2 Final management

There is a broad international consensus on the option of disposal of SF and HLW in deep geological formations. According to Directive 2011/70/Euratom: 'It is broadly accepted at the technical level that, at this time, deep geological disposal represents the safest and most sustainable option as the end point of the management of high-level waste and spent fuel considered as waste.' In line with this directive, the proposal for the 7th GRWP submitted by ENRESA to MINETUR considers that the preferred option is temporary storage, followed by a definitive disposal facility.

B.5. Radioactive waste management policies and practices

As indicated in the Introduction to this Report, the Government is responsible for establishing policy on radioactive waste management, including the management of spent nuclear fuel and the dismantling and decommissioning of nuclear facilities, through the approval of the GRWP. This Government function is laid down in Article 38a of the NEA.

Given that HLW and SW have been addressed in previous sections relating to SF, this section will refer only to management policy for LILW.

As has been stated in previous National Reports, LILW is produced in Spain through the operation and dismantling of regulated nuclear and radioactive facilities which use radioactive substances or materials. In addition, waste resulting from incidents at facilities not requiring authorisation within the nuclear energy regulatory framework (such as steelyards and metal recycling plants) may also require management. In these cases, suitable mechanisms have been put in place for prevention and, when necessary, recovery of control over radioactive materials and guarantee of their safe management as waste.

At the current time, it may be stated that Spain has resolved the overall issue of LILW management, given that there is an integrated management system with the necessary capacities, config-

ured on the basis of the assignation of responsibilities to a group of clearly identified agents operating in a structured manner.

Within this system, nuclear facilities have their own treatment capabilities for conditioning waste in accordance with ENRESA's waste acceptance specifications for the El Cabril disposal facility. In the remaining cases, producers deliver their waste to ENRESA in accordance with agreed technical specifications, and ENRESA carries out the necessary conditioning tasks.

The El Cabril disposal facility in the province of Córdoba is the central axis around which the national LILW management system revolves. Its fundamental objective is the definitive disposal of this type of waste in solid form, and it also has various technological capabilities, such as treatment and conditioning facilities for the processing of waste from radioactive facilities and waste removed from non-regulated installations. In addition, it carries out final conditioning, configuring the disposal units for their placement in the disposal vaults. The El Cabril centre also has waste characterisation and verification laboratories, where the required tests for the acceptance of different types of waste and the verification of their characteristics are carried out, as well as workshops, laboratories and other auxiliary systems necessary for its operation.

The analysis of requirements and the experience accumulated in Spain in LILW management has made it possible to identify areas for improvement and define the most suitable actions in the pursuit of optimisation.

As indicated in the Fourth National Report, the projections for the current GRWP take into consideration the generation of a considerable volume of radioactive waste with very low levels of radioactivity (VLLW) over the coming years, fundamentally from the dismantling of nuclear facilities. For this purpose and as of 2008, the El Cabril facility has a specific area for the disposal of VLLW, consisting of one disposal cell with a capacity for approximately 30,000 m^3. In the future, a further three cells will be added, in order to fully utilise the total authorised capacity of 130,000 m^3. The first of these cells is now under construction, as described in Article 13.1.1.

Aerial view of ENRESA'S El Cabril disposal facility for LILW and VLLW.

VLLW disposal cell at El Cabril (cell 29).

The minimisation of waste generation and volume, with the aim of cell occupation optimisation, is an ongoing course of action. To this end, the policy of collaboration between ENRESA and the principal waste producers will be continued and reinforced, through participation in joint working groups, developing and deploying equipment for treatment, decontamination and characterisation in the various plants, and jointly undertaking projects that enable the application of technology and equipment for volume reduction, declassification and decontamination.

Significant advances made in volume reduction include the development of semi-industrial plasma treatment equipment, waste desiccation, treatment of legacy waste, large equipment treatment and waste declassification projects.

With regard to definitive disposal activities, waste characterisation, methods and techniques for understanding disposal system performance and safety assessment, the following courses of action are noteworthy:

- ✓ Analysis of projected inventories and available capacities.
- ✓ Improvement in characterisation techniques and radioactive waste package measuring techniques.
- ✓ Acquisition of information and development of methodological and instrumental improvement in order to optimise safety assessment in the facilities.
- ✓ Continued studies on the durability of the engineered barriers disposal system
- ✓ Continued data sampling on the test coverings for the purposes of the final design for the definitive storage coverings.
- ✓ Study of new configurations for disposal units as a result of the replacement or dismantling of large components from nuclear facilities.

With regard to the adjustments and improvements to El Cabril's functions and the availability of resources for future situations, the main actions in progress are:

- ✓ The provision of new handling resources to increase the operational capacity of VLLW disposal.
- ✓ The viability study on the design of new disposal vaults for LILW, as a result of the revision of current estimates for waste generation.
- ✓ Ongoing support actions for radioactive facilities for optimising the on-site management of their waste.

Section C

Scope of application

Section C. Scope of application

This section comprises 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.*

In Spain the scope of application of the Convention extends to the following:

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

In the past, certain quantities of spent fuel were sent abroad for reprocessing; the various resulting products that are to be returned to Spain will also be included in the scope of application.

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Section D

Inventories and lists

Section D. Inventories and lists

Article 32. Reporting

(...)

2. This report shall also include:

i) a list of the spent fuel management facilities subject to this Convention, their location, main purpose and essential features;

ii) an inventory of spent fuel that is subject to this Convention and that is being held in storage and of that which has been disposed of. This inventory shall contain a description of the material and, if available, give information on its mass and its total activity;

iii) a list of the radioactive waste management facilities subject to this Convention, their location, main purpose and essential features;

iv) an inventory of radioactive waste that is subject to this Convention that:

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

b. has been disposed of; or

c. has resulted from past practices.

This inventory shall contain a description of the material and other appropriate information available, such as volume or mass, activity and specific radionuclides;

v) a list of nuclear facilities in the process of being decommissioned and the status of decommissioning activities at those facilities.

D.1. Spent fuel management facilities

Spent nuclear fuel is currently stored in pools at the operational nuclear power plants. Additionally, the Trillo, José Cabrera and Ascó nuclear power plants have individual spent fuel storage installations (ISFSI). At Trillo, the pool system is supplemented with metallic casks housed in a dry storage building. At the José Cabrera plant, following its definitive shutdown and the initiation of preparatory tasks for dismantling, the spent fuel was transferred to an on-site independent facility for dry storage in metal and concrete type casks. The Ascó nuclear power plant uses the same system to fully utilise its capacity for SF management.

Table 2 includes the existing facilities.

Table 2: Existing spent fuel storage facilities.

Name of facility	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
Sta. M. 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 plant are located in the reactor buildings. In the rest of the operational plants, the pools are located in a building adjoining the containment building and connected to it by means of the transfer canal. When there are two reactors on the same site, as is the case with Almaraz and Ascó, each unit has its own pool. In the case of the Cofrentes nuclear power plant there is also a pool inside the reactor building which is used for the temporary storage of the fuel during refuelling.

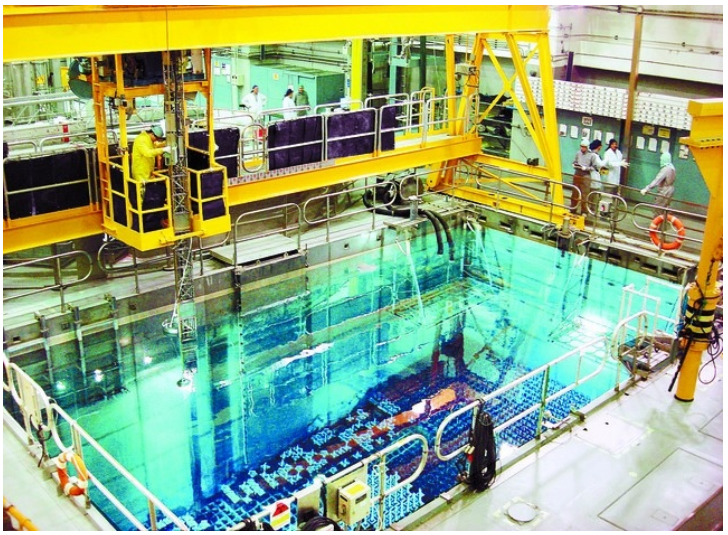
The spent fuel storage pools whose initial capacity was increased by re-racking with high density units have a reserve capacity for a complete reactor core should the need arise, in accordance with nuclear power plant operational requirements.

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

a) Trillo nuclear power plant

The Trillo nuclear power plant cask storage facility has been in operation since mid-2002. It is a rectangular surface building with a capacity for 80 ENSA-DPT casks, with 23 already in place. The metal ENSA-DPT cask has been designed for the safe storage and transport of 21 PWR 16x16-20 fuel assemblies for Kraftwerk Union (KWU) type light water reactors. Its design fulfils the requirements of 10 CFR 72, the IAEA Regulation on the safe transport of radioactive substances, and Spanish transport regulations.

During the period covered by this Report, the most relevant developments include the safety assessment of the design modification for the storage of high burnup fuel



The fuel pool at the Santa María de Garoña nuclear power plant.

of up to 49 MWd/tU and 9 years of cooling. In addition, some changes have been applied to the ISFSII radiological control in accordance with the cCSN's new position, which requires an external dose rate at the storage building of < 0,5 µSv/h (instead of < 1 µSv/h).

b) José Cabrera nuclear power plant

The José Cabrera nuclear power plant was definitively shut down in April 2006. The chosen option was immediate complete dismantling, so that the site may be fully released for use without any type of restriction. As a preliminary step, the spent fuel stored in the pool was transferred to an on-site temporary dry storage facility, as described in the previous National Report.

Since commencement of operation in 2008, the ISFSI at the José Cabrera nuclear power plant, which stores the SF generated during the plant's operation in 12 casks, has been operating normally.

c) Ascó nuclear power plant

Taking into account firstly the period required for licensing and construction of the CTS facility and secondly the period of time projected until saturation is reached in the pools at the two Ascó units, it was considered necessary to construct a dry storage ISFSI for the spent fuel produced by this plant until the fuel can be transported to the CTS.

The system selected, similar to that used in the José Cabrera plant ITS, is made up of three clearly differentiated components: a multi-purpose metal canister with capacity for 32 fuel assemblies, constituting a hermetically sealed confinement barrier; a storage module (concrete-steel hybrid) housing the canister for long-term storage; and a transfer container used for canister loading, unloading and transfer operations. The final part of the system is the transport cask for the future transport

The interior of the ITS at the Trillo nuclear power plant.

of the loaded canister to the facility in which the next stage of management will be carried out.

The ISFSI consists of two earthquake resistant storage slabs, one for each unit, on which up to 32 storage casks will be placed, with a total capacity of 1,024 fuel assemblies. This is an external facility linked to the plant's two units by an access

The José Cabrera Nuclear Power Plant ITS facility.

Transport of spent fuel cask to the Ascó nuclear power plant ITS facility.

road for the transfer of the loaded storage modules by means of a special vehicle for this task. The licensing of this ISFSI facility was completed in April 2013 and it is currently operational with 2 casks, since May 2013.

D.2. Spent fuel inventory

The total amounts of spent fuel in Spain as of 31 December 2013 are shown in Table 3.

D.3. Radioactive waste management facilities

Article 2 of the Joint Convention defines radioactive waste management facilities as follows:

> *'radioactive waste management facility' means 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.*

On the basis of this definition, the scope of this list of facilities does not include minor producers, since their radioactive waste is collected and processed by ENRESA at the El Cabril disposal facility. Consequently, the radioactive waste management facilities are as follows:

✓ Operational nuclear power plants

All the nuclear power plants have facilities for the treatment of their liquid waste and conditioning of solid waste: precompaction and immobilisation. There are also temporary storage facilities at each plant for safeguarding the waste prior to transfer to the El Cabril LILW definitive disposal facility.

Table 3: Spent nuclear fuel currently in Spain.

Name of facility	Spent fuel characteristics	Total capacity/ reserve core (no. of assemblies)	SF in storage (no. of assemblies)	SF in storage (tU)
Almaraz I NUCLEAR POWER PLANT	PWR 17x17	1,804/157	1,328	613
Almaraz II NUCLEAR POWER PLANT	PWR 17x17	1,804/157	1,316	607
Vandellós II NUCLEAR POWER PLANT	PWR 17x17	1,594/157	1,084	491
Ascó I NUCLEAR POWER PLANT	PWR 17x17	1,421/157	1,164	531
		ITS facility with capacity for 16 casks, each containing 32 assemblies	64 (2 casks)	29
Ascó II NUCLEAR POWER PLANT	PWR 17x17	1,421/157	1,200	548
		ITS facility with capacity for 16 casks, each containing 32 assemblies	0	0
Cofrentes NUCLEAR POWER PLANT	BWR 8x8, 9x9	5,404/624	3,980	723
Sta. M. Garoña NUCLEAR POWER PLANT	BWR 8x8, 9x9	2,609/400	2,505	440
José Cabrera NUCLEAR PLANT	PWR 14x14	ITS facility with capacity for 12 casks, each containing 32 assemblies	377 (12 casks)	100
Trillo NUCLEAR POWER PLANT	PWR 16x16	805/177	577	283
		ITS facility with capacity for 80 casks, each containing 21 assemblies	483 (23 casks)	227

✓ Vandellós I nuclear power plant, in the dismantling phase

The plant has an installation in the lower part of the reactor building for the temporary storage of low and intermediate level waste generated during the process of dismantling, which functions as an interim specific solution for the graphite waste from fuel assembly sleeves.

✓ José Cabrera nuclear power plant, in the dismantling phase

The plant has liquid and solid waste treatment facilities that have continued to operate following the shutdown of the plant. The waste resulting from certain ongoing decontamination tasks are treated at these facilities and temporarily stored at the plant prior to being shipped to El Cabril.

During 2013, the dismantling tasks on the plant's reactor internals were carried out and completed, generating a SW inventory that is currently stored in the on-site ISFSI facility which houses the SF. The chosen storage system is similar to that used for the plant's SF storage. With the ISFSI design modification approved for use as a radioactive waste storage facility, the four required containers were loaded and stored during the summer of 2013.

✓ Juzbado fuel manufacturing facility

Like the nuclear power plants, this facility has a treatment plant for its liquid waste, using desiccation and immobilisation in cement. For the preconditioning of its solid waste the facility uses precompaction and for final conditioning, immobilisation in cement. The existing temporary storage facility serves as an interim measure prior to the transport of the waste to El Cabril.

✓ CIEMAT (processing and temporary storage facilities)

The Centre for Energy-related, Environmental and Technological Research (CIEMAT) is authorised for the conditioning of solid low and intermediate level waste generated at the centre. It is also authorised for the provisional storage of sources and other radioactive materials in transport packages meeting the requirements established in the national Regulation on road transportation of hazardous goods.

CIEMAT treats and conditions waste arising from research activities carried out at the centre, which are fundamentally related to developments for radioactive waste management, the monitoring of materials and other activities involving the use of radioactive materials and tracers.

During the period covered by this Fifth National Report, CIEMAT has extended its temporary storage capacities in order to enable the storage of very low level or clearable waste arising from the PIMIC-Rehabilitation project (see Section D.5) by authorising the use of pre-existing buildings especially conditioned for this purpose.

✓ El Cabril low and intermediate level waste disposal facility

The El Cabril disposal facility has treatment and conditioning systems for solid and liquid waste. These systems are used to treat and condition all relevant waste prior to final disposal at the facility. In view of policy defined in the GRWPs, most of the waste treated and conditioned at El Cabril comes from radioactive facilities or is generated at the centre itself, although the facility also has the necessary systems for the final conditioning of waste from nuclear facilities prior to their final disposal in disposal cells.

A) Low and intermediate level waste (LILW)

➪ Treatment and conditioning of waste from radioactive facilities.

Waste generated by institutional producers (radioactive installations for industrial, medical, agricultural and research purposes) is segregated by them at their facilities and subsequently transported to El Cabril. The transfer of the waste is undertaken in accordance with a removal agreement between the producer and ENRESA, which adheres to the system of waste categorisation set

out by the MINETUR. Treatment of the different types of waste at the El Cabril facility is performed in such a way as to minimise the production of secondary waste and to obtain conditioned packages which meet the requirements for subsequent incorporation in disposal units.

The conditioning building at El Cabril is equipped with a specific area for the treatment and conditioning of waste from institutional producers, as described in the Fourth National Report.

- Final conditioning of waste from large producers.

  Large producers (nuclear power plants and the fuel assembly manufacturing facility) are required to condition their LILW in packages meeting ENRESA's acceptance criteria for transport and disposal to the El Cabril facility, so that in the majority of cases they do not require subsequent treatment processes.

  There is also a second category comprising waste packages that have been pre-compacted at their place of origin because of their physical characteristics. The El Cabril facility has a drum compacter with a capacity of 1200 t.

  In both cases, packages are conditioned in disposal units for their disposal.

- Temporary storage at the El Cabril facility.

  The El Cabril facility has two sets of installations used for the temporary storage of solid waste: the 'modules' and the transitory reception building. The first are three buildings constructed during the 1980s for long-term temporary waste storage. Each has a nominal capacity for 5,000 220-litre drums. At present the process of identifying units produced prior to 1992 is ongoing, with the aim of transferring them to the disposal cells following verification of compliance with the acceptance criteria. In addition, these installations are used to house special and heterogeneous waste pending further treatment for final disposal. El Cabril's on-site transitory reception building has an area for the buffer storage of waste packages.

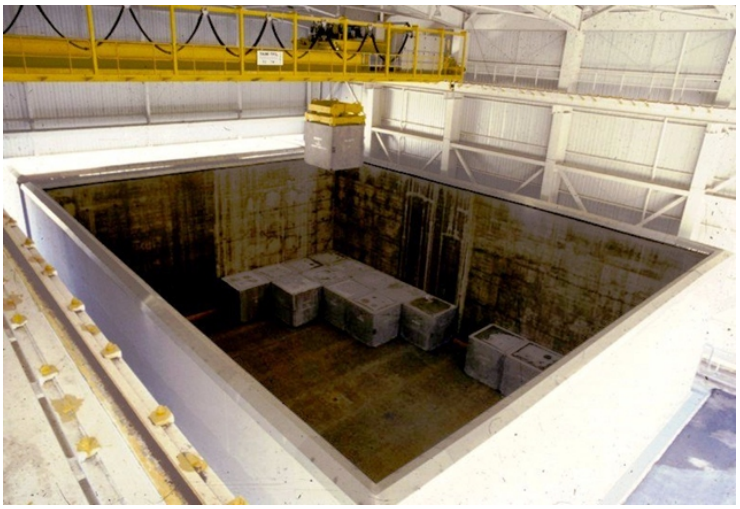
- Definitive disposal at the El Cabril facility.

  The low and intermediate level waste disposal system at El Cabril is of the near-surface type in disposal vaults. There are currently 28 disposal vaults.

  The conditioned waste packages are transferred to disposal units which, once full, are transported to the disposal platform and placed in the vaults.

B) Very low level waste (VLLW)

As of 2008, the El Cabril facility has been equipped with a specific very low level waste (VLLW) disposal area, consisting of an initial cell with a disposal capacity of some 30,000m^3. The cell consists of a pit excavated in the ground with a series of layers of drainage and waterproofing materials to prevent the potential dispersion of leachates into the environment. The aim in the future, when this cell is full, is to construct three further cells until the authorised capacity of 130,000m^3 is fully utilised. In this way it will be possible to definitively dispose of contaminated materials, arising mainly from the dismantling of facilities, whose specific activity is hundreds of times lower than that of the LILW currently disposed of in the other area of El Cabril.



Container loading in a LILW vault at the El Cabril disposal facility.

The VLLW arrives at El Cabril in drums, big-bags or metallic containers and is either sent directly to the cell or temporarily deposited in the Technology Building. This building is equipped with systems for stabilisation by means of inertisation.

Table 4 contains a list of the various radioactive waste management facilities, including their location, purpose and main characteristics.

Interior of the VLLW cell at ENRESA's El Cabril disposal facility.

Table 4: Radioactive waste management facilities.

Name of facility	Location (province)	Main purpose	Other characteristics
Almaraz I NUCLEAR POWER PLANT	Cáceres	Treatment, preconditioning and temporary storage	Management facilities for waste from the operation of each of the nuclear power plants
Almaraz II NUCLEAR POWER PLANT	Cáceres	Treatment, preconditioning and temporary storage	
Vandellós II NUCLEAR POWER PLANT	Tarragona	Treatment, preconditioning and temporary storage	
Ascó I NUCLEAR POWER PLANT	Tarragona	Treatment, preconditioning and temporary storage	
Ascó II NUCLEAR POWER PLANT	Tarragona	Treatment, preconditioning and temporary storage	
Cofrentes NUCLEAR POWER PLANT	Valencia	Treatment, preconditioning and temporary storage	
Sta. M. Garoña NUCLEAR POWER PLANT	Burgos	Treatment, preconditioning and temporary storage	
Trillo NUCLEAR POWER PLANT	Guadalajara	Treatment, preconditioning and temporary storage	
José Cabrera NUCLEAR PLANT	Guadalajara	Treatment, preconditioning and temporary storage	
Vandellós I NUCLEAR PLANT	Tarragona	Temporary storage	Storage facilities for part of the waste arising from plant dismantling
Juzbado Manufacturing Facility	Salamanca	Treatment, preconditioning and temporary storage	Management facilities for technological waste from plant operation
CIEMAT	Madrid	Preconditioning and temporary storage	Facilities inside the Nuclear Research Centre
El Cabril Facility	Córdoba	Temporary storage	3 concrete modules + Transitory Reception building
		Final disposal	28 near-surface reinforced concrete vaults for LILW 1 trench cell for VLLW

D.4. Radioactive waste inventory

Table 5 shows the radioactive waste inventory as of 31 December 2013.

Table 5: Radioactive waste inventory.

Name of facility	Type of facility	Type of waste	Volume (m^3)
Almaraz I-II NPP	NPP	VLLW	272
		LILW	1,294
Vandellós II NPP	NPP	VLLW	106
		LILW	239
Ascó I-II NPP	NPP	VLLW	411
		LILW	580
Cofrentes NPP	NPP	VLLW	766
		LILW	1,074
Sta. M. Garoña NPP	NPP	VLLW	73
		LILW	769
Trillo NPP	NPP	VLLW	70
		LILW	72
José Cabrera NPP	NPP	VLLW	40
		LILW	7
		SW	27
Vandellós I NPP	NPP	VLLW	1,165
		LILW	2,785
Juzbado Manufacturing Facility	Fuel assembly manufacturing facility	VLLW	374
		LILW	84
CIEMAT	Research Centre	VLLW	1,557
		LILW	4
El Cabril facility	Temporary storage	VLLW	570
		LILW	586
	Disposal	VLLW	7,612
		LILW	29,602

D.5.
Facilities in the decommissioning phase

✓ **Vandellós I nuclear power plant**

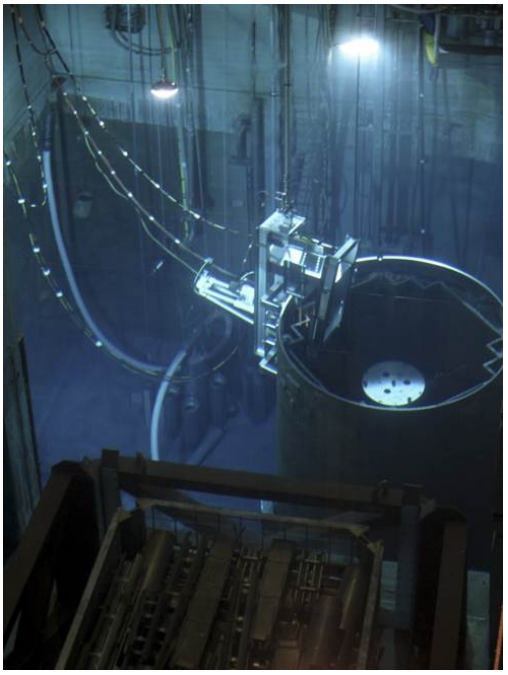
The Vandellós I nuclear power plant was operational from 1972 until October 1989, when it suffered an accident in its conventional zone. Using French technology, this was the only gas-graphite plant constructed in Spain. In 1992, following the definitive suspension of its operating permit, the former Ministry of Industry and Energy accepted the dismantling option proposed by ENRESA. The plan consisted of the partial dismantling of the facility to IAEA Level 2, followed by a dormancy period of some 25 years and subsequent total dismantling to IAEA Level 3.

Although the dismantling project was completed to Level 2 in June 2003, it was not until January 2005 that the dormancy period formally began, following the issuance of the corresponding Ministerial Resolution by the Directorate General for Energy Policy and Mines. During this dormancy period, there are ongoing surveillance and monitoring activities which are required before the dismantling of the facility to Level 3 can be undertaken at the end of the established waiting period.

✓ **José Cabrera nuclear power plant**

The José Cabrera nuclear power plant was shut down in April 2006, following a decision by the authorities not to renew its operating permit. It is a pressurised water reactor (PWR) plant with a low power output (160 MW). Starting up in 1968, it was Spain's first operational nuclear power plant.

Vandellós I nuclear power plant, in the dismantling phase, currently in the dormancy period.



Cutting of the internals at the José Cabrera nuclear power plant.

As stated in the Fourth National Report, ENRESA became the licensee of the facility for the purpose of its dismantling, by order of the Ministerial Order of 1 February 2010.

In accordance with the strategy established by the 6th GRWP, the plant is being totally dismantled so that the site may be released for other uses.

As has been pointed out in Section D.1 above, the spent fuel is currently in storage in an on-site ITS facility.

✓ **CIEMAT facilities**

The Integrated Plan for the Improvement of the CIEMAT Facilities (PIMIC) consists of dismantling certain obsolete facilities for which no further use is foreseen and of making use of the areas released for other activities. The activities of the Plan, which are expected to continue until 2015, are monitored and supervised by the NSC and the MINETUR. During its implementation, CIEMAT will continue to be responsible for the facility, as licensee, and will provide any necessary support.

The PIMIC project began with site preparation tasks, including the auxiliary installations required for the undertaking of dismantling and rehabilitation activities. During the 2010-2014 period, ongoing activities include equipment and system disassembly, decontamination, declassification and restoration of the various facilities and areas of land.

✓ **Quercus uranium concentrate manufacturing plant at Saelices el Chico (Salamanca)**

Since the Ministerial declaration of its definitive shutdown in 2003, this facility has been non-operational. Currently, activities at the facility involve the treatment of liquid effluents for their conditioning and discharge, since production of uranium concentrates has ceased.

In 2005, the National Uranium Company, ENUSA, as licensee of the plant, requested authorisation from the then Ministry of Industry, Tourism and Trade to proceed with the plant's dismantling.

ENUSA subsequently decided to postpone their decision to dismantle the plant in light of a possible resumption of operation, given the evolution of uranium concentrate prices. Thus they requested a sine die suspension of the licensing process for the plant's dismantling. By means of successive resolutions by the Directorate General for Energy Policy and Mines, and subject to NSC reports, the temporary suspension of this process has been prolonged.

Finally, by Resolution of the Directorate General for Energy Policy and Mines of 30 October 2012, ENUSA Industrias Avanzadas S.A., the licensee of this facility, was required to submit an application for authorisation for dismantling within one year. This was presented on 30 October 2013 and is currently undergoing assessment by the Nuclear Safety Council.

The Quercus plant's site is shared with the Elefante plant (an old, now dismantled, concentrate manufacturing facility currently in the monitoring and compliance period) and the Saelices el Chico mines (restored between 2004 and 2008). This circumstance means that the dismantling of the Quercus plant must be tackled in two phases, since certain structures, systems and facilities must remain operative for the management, treatment and conditioning of the water generated at the site.

✓ **Andújar Uranium Mill**

Surveillance tasks continue at the site of the Andújar Uranium Mill (AUM), in accordance with the requirements laid down in the terms and conditions issued by the NSC and set out in the Resolution of the Ministry of Industry and Energy of 17 March 1995.

The old Quercus uranium concentrate manufacturing plant at Saelices el Chico.

The restored site of the old Andújar uranium mill.

Table 6: Facilities in the dismantling phase

Facilities in the dismantling phase				
Programme	**Name**	**Location**	**Status**	**Implementation**
Vandellós I NUCLEAR POWER PLANT dismantling project	Vandellós I	Vandellós, Tarragona	Latency (dismantled to Level 2)	1998-2004
José Cabrera NUCLEAR POWER PLANT dismantling project	José Cabrera NUCLEAR PLANT	Zorita de los Canes (Guadalajara)	Undergoing dismantling and decommissioning	2010-2016
Integrated Plan for the Improvement of the CIEMAT Facilities (PIMIC)	CIEMAT	Madrid	Completing implementation	2004-2015
Saelices el Chico facilities dismantling and restoration plan	Quercus	Saelices el Chico	Application for authorisation for dismantling 30 October 2013	Activities will begin once dismantling authorisation is granted
	Elefante		Surveillance and maintenance phase	2001-2004
	Mining facilities		Restored	2004-2008
Compliance period for the old Andújar uranium mill (AUM)	AUM	Andújar (Jaén)	Dismantled. Surveillance and maintenance phase	1991-1995

D.6.
Decommissioned facilities

During the period between the production of the Fourth National Report and this report, no declarations of decommissioning have been issued for any facility, as a result of which the situation of the decommissioned facilities remains unchanged.

Section E

Legislative and regulatory system

Section E. Legislative and regulatory system

Article 18
Implementing measures

Article 18. Implementing measures

Each Contracting Party shall take, within the framework of its national law, the legislative, regulatory and administrative measures and other steps necessary for implementing its obligations under this Convention.

Spain has a legislative, regulatory and administrative framework adequate for compliance with the obligations deriving from this Convention. The Ministry of Industry, Energy and Tourism (MINETUR) and the Nuclear Safety Council (CSN) continue to work within their respective realms of competence on the ongoing improvement and development of regulations concerning the management of waste and spent fuel.

This development takes into consideration the applicable national legislation, international experience and standards, in particular analysis of the applicability of the IAEA's programme of standards for the safe management of waste, and all non-regulatory elements that have made it possible to successfully address issues arising from the authorisations granted to date for radioactive waste management.

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 to govern the safety of spent fuel and radioactive waste management.*
2. *This legislative and regulatory framework shall provide for:*
   - *(i) the establishment of applicable national safety requirements and regulations for radiation safety;*
   - *(ii) a system of licensing of spent fuel and radioactive waste management activities;*

(iii) a system of prohibition of the operation of a spent fuel or radioactive waste management facility without a licence;

(iv) a system of appropriate institutional control, regulatory inspection and documentation and reporting;

(v) the enforcement of applicable regulations and of the terms of the licences;

(vi) a clear allocation of responsibilities of the bodies involved in the different steps of spent fuel and of radioactive waste management.

3. When considering whether to regulate radioactive materials as radioactive waste, Contracting Parties shall take due account of the objectives of this Convention.

19.1 Developments in the main legal provisions governing the management of spent fuel and radioactive waste

This section describes the developments that have been made in the legal provisions of the internal legal system in the field of spent fuel and radioactive waste management. It also includes changes that have occurred in the European Community Regulations and Directives in this field, whose provisions are directly applicable to the internal legal system or need to be transposed into it.

Council Directive 2011/70/Euratom of 19 June 2011, establishing a Community framework for the responsible and safe management of spent fuel and radioactive waste

This Directive establishes a Community framework for ensuring responsible and safe management of spent fuel and radioactive waste to avoid imposing undue burdens on future generations. It ensures that Member States provide for appropriate national arrangements for a high level of safety in spent fuel and radioactive waste management to protect workers and the general public against the dangers arising from ionising radiation.

This Directive shall apply to all stages of spent fuel management when the spent fuel results from civilian activities, and radioactive waste management, from generation to disposal.

For the purpose of this Directive the following definitions shall apply:

'radioactive waste' means radioactive material in gaseous, liquid or solid form for which no further use is foreseen or considered by the Member State or by a legal or natural person whose decision is accepted by the Member State, and which is regulated as radioactive waste by a competent regulatory authority under the legislative and regulatory framework of the Member State;

'spent fuel' means nuclear fuel that has been irradiated in and permanently removed from a reactor core; spent fuel may either be considered as a usable resource that can be reprocessed or be destined for disposal if regarded as radioactive waste.

The Directive focuses on a series of operational objectives:

- ✓ Disposal of radioactive waste in the Member State in which it was generated unless an agreement has entered into force with another Member State or a third country, which must be reported to the European Commission.

- ✓ A national legislative, regulatory and organisational framework with a national programme for the implementation of spent fuel and radioactive waste management policy.
- ✓ Reinforcement of the role of the national regulatory authority and of their independence.
- ✓ Responsibility of the license holder in matters of safety, under the control of the competent regulatory authority.
- ✓ Adequate financial and human resources for all stages involved in management.
- ✓ Transparency of information related to management and obligatory reporting to the European Commission.
- ✓ Periodic self-assessments of the national frameworks and competent regulatory authorities, and peer reviews.

Royal Decree 102/2014 of 21 February on the safe and responsible management of spent nuclear fuel and radioactive waste, finalises the transposition of this Directive into the national legal system, as described in Article 19.2 of this Report

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

This Directive repeals five previous Directives concerning these matters, in order to establish uniform basic safety standards for occupational, medical and public radiological protection within a single Community legal instrument. This Directive applies to any planned, existing or emergency exposure situation which involves a risk from exposure to ionising radiation. It sets out dose limits taking into account general principles of radiation protection. This Directive also covers exposure due to natural radiation (including NORM and radon) and sets out the requirements for radiation protection education, training and information. Additionally, it sets out provisions for the Member States to adopt measures for raising general awareness of the possible existence of orphan sources and their associated hazards, as well as for their recovery, management and control.

Because of the breadth of the issues covered by the Directive, there is a transposition deadline of 4 years. For this purpose, a national working group has been formed involving the participation of the CSN and the relevant ministries.

Law 15/2012 of 27 December on fiscal measures for sustainable energy, amended by Law 16/2013 of 29 October

Law 15/2012 of 27 December on fiscal measures for sustainable energy introduced the enforcement as of 1 January 2013 of two new State-level taxes which apply to the production of spent nuclear fuel and radioactive waste, and their storage and disposal in centralised facilities. Law 15/2012 was subsequently amended, with retrospective effect from 1 January 2013, by Law 16/2013 of 29 October, establishing certain measures for environmental taxation and adopting other financial and tax measures, with the aim of clarifying the regulation and practical application of the taxation.

The principal characteristics of the taxes are as follows:

- ✓ Tax on the production of spent nuclear fuel and radioactive waste:
  - ➪ The tax on the production of spent nuclear fuel applies to the kilograms of heavy metal (uranium and plutonium) present in spent nuclear fuel at the time at which it is definitively extracted from a nuclear reactor. Consequently the licensees of the nuclear power plants are liable for this tax.
  - ➪ The tax on the production of radioactive waste applies to the cubic metres of intermediate, low and very low level radioactive waste resulting from the generation of nuclear electric energy (low and intermediate level waste and very low level waste differentiated by means of specific types of tax). For this purpose, waste is understood to have been generated when it has been conditioned for its temporary on-site storage at the facility which produced it. The licensees of the nuclear power plants are also liable for this tax.
- ✓ Tax on the storage and disposal of spent nuclear fuel and radioactive waste in centralised facilities:
  - ➪ The tax on the storage and disposal of spent nuclear fuel applies to all activity involving the temporary or definitive immobilisation of fuel in a centralised facility, by which is understood a facility which can store spent fuel deriving from various facilities and origins. Although there is no centralised facility for the storage and disposal of spent nuclear fuel currently in existence, the tax will apply to all nuclear fuel that will be stored in future at the projected Centralised Temporary Storage facility (CTS) in Villar de Cañas, under ENRESA's management.
  - ➪ The tax on the storage and disposal of radioactive waste applies to all activity involving the temporary or definitive immobilisation of high, intermediate, low or very low level radioactive waste at a centralised facility. From a practical point of view, this tax applies, with differing types of taxation, to low and intermediate level waste and very low level waste accepted at the El Cabril Disposal Facility, given that this is the only authorised facility for the centralised disposal of waste of these types. Consequently, ENRESA, as licensee, is solely liable for this tax. This tax is imposed on the same taxable events as those established in the Andalusian tax on the disposal of radioactive waste in dumping sites located within the Autonomous Community of Andalusia, regulated until then by Andalusian Law 12/2006 of 27 December (mentioned in the Third National Report), that had applied to the El Cabril disposal facility.

    In future, the tax on the storage and disposal of radioactive waste will also be imposed on high level radioactive waste, as distinct from the long lived intermediate level spent nuclear fuel that is stored at the CTS.

Law 15/2012, amended by Law 16/2013, includes detailed regulations on taxable events and tax bases, the types of applicable taxation, periods of liability and deadlines, and forms of assessment and settlement of the tax. It also sets out provisions for payment in instalments with a view to establishing a homogeneous annual tax collection.

Law 21/2013 of 9 December on environmental assessment

This law, in force since 12 December 2013, unifies the legal framework on environmental assessment of plans and programmes and the legal framework on environmental assessment of projects, regulated until then by two different provisions, now repealed: Law 9/2006 of 28 April on the assessment of the effects of certain plans and programmes on the environment; and Royal

Legislative Decree 1/2008 of 11 January approving the reworked text of the Law on environmental impact assessment of projects.

Regarding European Community legislation, Directive 2011/92/EU of 13 December on the assessment of the effects of certain public and private projects on the environment was transposed into the Spanish legal system in Law 21/2013, which also maintains the provisions already set out as a result of Directive 2001/42/CE of 27 June on the assessment of the effects of certain plans and programmes on the environment.

The assessment of plans and programmes facilitates the incorporation of sustainability criteria in strategic decision making, while the assessment of projects ensures adequate prevention of potential specific environmental impacts, at the same time as establishing effective mechanisms for rectification or compensation.

This law sets out the bases governing environmental assessment of plans, programmes and projects which may have significant effects on the environment, assuring a high level of environmental protection throughout the Spanish State, with the aim of promoting sustainable development, by means of:

a) Integration of environmental aspects during the development and in the adoption, approval and authorisation of plans, programmes and projects;

b) Analysis and selection of viable environmental options;

c) Establishment of measures for the prevention, rectification and, where appropriate, compensation of adverse effects on the environment;

d) Establishment of the surveillance, monitoring and penalty measures necessary for compliance with the purposes of this law.

Likewise, this law sets out the guiding principles for the environmental assessment procedure for plans, programmes and projects that may have significant impact on the environment, as well as the system for cooperation between the State General Administration and the Autonomous Communities, by means of the Environment Sector Conference.

The environmental assessment procedure is subject to the following principles:

a) Protection and improvement of the environment;

b) Precaution;

c) Preventative and precautionary action, rectification and compensation for environmental impact;

d) The polluter pays;

e) Rationalisation, simplification, and coordination of environmental assessment procedures;

f) Cooperation and coordination between the State General Administration and the Autonomous Communities;

g) Proportionality of the environmental impacts of plans, programmes and projects and the type of assessment process to which they are subject;

h) Active collaboration of the various administrative bodies involved in the assessment process, providing any necessary information as required;

i) Public involvement;

j) Sustainable development;

k) Integration of environmental aspects in decision-making;

l) Activities carried out in accordance with the best possible scientific knowledge.

The project submitted by ENRESA to MINETUR for the 7th General Radioactive Waste Plan will be subject, once its administrative processing begins, to Strategic Environmental Assessment. Projects in the field of nuclear industries requiring environmental assessment include the following:

a) Nuclear power plants and other nuclear reactors including the dismantling or decommissioning of such power plants or reactors (except research installations for the production and conversion of fissionable and fertile materials, whose maximum power does not exceed 1 kilowatt continuous thermal load);

b) Installations for the reprocessing of irradiated nuclear fuel;

c) Installations designed:

1. for the production or enrichment of nuclear fuel;
2. for the processing of irradiated nuclear fuel or high-level radioactive waste;
3. for the disposal of irradiated nuclear fuel;
4. solely for the disposal of radioactive waste;
5. solely for the storage (planned for more than 10 years) of irradiated nuclear fuels or radioactive waste in a site different to the production site.

Law 24/2013, the Electrical Industry Act of 26 December

Law 24/2013, the Electricity Industry Act of 26 December, which repealed Law 54/1997, the Electricity Industry Act of 27 November, is the principal legal instrument governing this sector, including the generation of electricity of nuclear origin. Additional Provision 9 expressly sets out that *'facilities producing electrical energy to which specific legislation for nuclear energy may be applicable will be governed by that legislation in addition to the provisions of this law'*.

It involves a global reform of the sector, based on a new system of revenues and expenses in the electrical energy system, in order to return the system to financial sustainability. An integration exercise is being carried out to produce a single text of the legal provisions dispersed throughout various regulations approved since Law 54/1997 came into force, also taking into account applicable European legislation on the electricity sector.

Despite the repeal of Law 54/1997, Law 24/2013 declares Additional Provision 6, regulating the Fund for the financing of activities included in the General Radioactive Waste Plan, in force.

19.2 Developments in regulatory provisions

During the period covered by the report, the Government has approved several regulatory provisions in relation to nuclear energy and has revised others. The most relevant aspects of the new and revised regulatory provisions are set out below.

Royal Decree 102/2014 of 21 February on the safe and responsible management of spent nuclear fuel and radioactive waste

Royal Decree 102/2014 on the safe and responsible management of spent nuclear fuel and radioactive waste involves the incorporation into the internal legal system of those provisions of Directive 2011/70/Euratom which were not regulated or whose regulation had been considered to require stipulation, given that a large number of this Directive's precepts were already included in Spanish legislation in provisions of various legal scopes. This Royal Decree also up-

dates the provisions of Royal Decree 1349/2003 of 31 October on the regulation of Spanish radioactive waste management agency ENRESA's activities and funding, which it repeals.

The Royal Decree, like the Directive, regulates the management of spent nuclear fuel and radioactive waste when it results from civilian activities, covering all stages, from generation to disposal, along the lines set out below.

- ✓ It establishes a series of general principles to follow, alongside those already regulated in Law 25/1965, the Nuclear Energy Act of 29 April (NEA):
  - a) The generation of radioactive waste shall be kept to the minimum which is reasonably practicable, both in terms of activity and volume, by means of appropriate design measures and of operating and decommissioning practices, including the recycling and reuse of materials;
  - b) The interdependencies between all steps in spent nuclear fuel and radioactive waste generation and management shall be taken into account;
  - c) Spent fuel and radioactive waste shall be safely managed, including in the long term with passive safety features, these being understood as based on an inherently safe design with components whose functioning is ensured by physical principles which are not dependent on external energy;
  - d) The costs for the management of spent fuel and radioactive waste shall be borne by those who generated those materials;
  - e) Implementation of measures shall follow a graded approach, in such a way that the level of analysis, documentation and actions is proportional to the degree of risk involved, the relative significance to the safety, purpose and characteristics of the facility or activity and any other factor considered relevant.
  - f) An evidence-based and documented decision-making process shall be applied with regard to all stages of the management of spent fuel and radioactive waste.
- ✓ It assigns prime responsibility regarding spent nuclear fuel and radioactive waste to those who produce it or, where applicable, to the licensee awarded the authorisation entailing this responsibility. It also affirms the management of these materials as an essential public service which is the responsibility of the State and awarded to ENRESA in virtue of the provisions of the NEA, without prejudice to the responsibilities corresponding to producers of these materials or to licensees awarded authorisation entailing these responsibilities.
- ✓ It sets out the procedure for the production, approval and review of the General Radioactive Waste Plan (GRWP) as well as its content, which is already largely covered by the 6th GRWP currently in force:
  - a) The overall objectives of the national policy in respect of spent fuel and radioactive waste management, including policy on dismantling and decommissioning nuclear facilities;
  - b) The significant milestones and clear timeframes for the achievement of those milestones in light of the overarching objectives;
  - c) An inventory of all spent fuel and radioactive waste and estimates for future quantities, including those from decommissioning, clearly indicating the location and amount of the radioactive waste and spent fuel in accordance with appropriate classification of the radioactive waste;
  - d) The concepts or plans and technical solutions for spent fuel and radioactive waste management from generation to disposal, including transport and the dismantling and decommissioning of nuclear facilities;

e) The concepts or plans for the post-closure period of a disposal facility's lifetime, including the period during which appropriate controls are retained and the means to be employed to preserve knowledge of that facility in the longer term;

f) The research, development and demonstration activities that are needed in order to implement solutions for the management of spent fuel and radioactive waste, as well as for the dismantling and decommissioning of nuclear facilities;

g) The responsibility for the implementation of the General Radioactive Waste Plan and the key performance indicators to monitor progress towards implementation;

h) An assessment of the General Radioactive Waste Plan costs, and the underlying basis and hypotheses for that assessment, which must include a profile over time;

i) The financing scheme in force;

j) Criteria for transparency and public involvement, to ensure that necessary information on the management of spent fuel and radioactive waste be made available to workers and the general public;

k) If any, the agreements concluded with a Member State or a third country on management of spent fuel or radioactive waste, including on the use of disposal facilities.

✓ It regulates some aspects relating to the financing of the General Radioactive Waste Plan, in particular the principles governing the financial management of the Fund for financing these activities, and the composition and functions of the Fund's Monitoring and Control Committee, as previously set out in Royal Decree 1349/2003, now repealed. This financing is regulated by legislation in the form of Additional Provision 6 of Law 54/1997, the Electricity Industry Act of 27 November, declared in force by Law 24/2013, and summarised in Annex F.

✓ It specifies the purpose and functions of ENRESA, with no significant changes to those previously set out in Royal Decree 1349/2003, which are:

a) The treatment and conditioning of spent nuclear fuel and radioactive waste, without prejudice to the responsibilities corresponding to producers of these materials or to licensees awarded authorisation entailing these responsibilities;

b) Site selection, design, construction and operation of facilities for the storage and disposal of spent nuclear fuel and radioactive waste;

c) The establishment of systems to ensure the safe management of spent nuclear fuel and radioactive waste in storage and disposal facilities;

d) The establishment of systems for the collection, transfer and transport of spent nuclear fuel and radioactive waste;

e) The production and management of the National Inventory of Spent Nuclear Fuel and Radioactive Waste, which will continue to list spent nuclear fuel and radioactive waste definitively disposed of, after the closure of the facility where they are deposited;

f) The adoption of safety measures for the transport of spent fuel and radioactive waste in accordance with the specific legislative provisions on the transportation of hazardous goods and the requirements of the competent bodies and authorities;

g) The management of operations relating to the dismantling and decommissioning of nuclear facilities and, where appropriate, radioactive facilities;

h) Action in the event of nuclear or radiological emergencies in line with the requirements of the competent bodies and authorities;

i) The production of training schemes and research and development plans within the framework of the State Plan for Scientific and Technical Research and Innovation, which cover the requirements of the General Radioactive Waste Plan and enable the acquisition, maintenance and further development of essential knowledge and skills;

j) The undertaking of the necessary technical, economic and financial studies, taking into account the deferred costs of its functions to determine the corresponding economic requirements;

k) The management of the Fund for the financing of activities included in the General Radioactive Waste Plan;

l) Any further activity necessary for the undertaking of the above functions.

✓ It includes the regular obligatory reporting of information by ENRESA to the MINETUR and the CSN.

✓ It defines the technical and administrative specifications for the acceptance of spent fuel and radioactive waste, which must be agreed by ENRESA and the waste producers (regulated by the previous Royal Decree 1349/2003 as contractual) and which must be approved by MINETUR, subject to a CSN report.

✓ It establishes that radioactive waste generated in Spain shall be disposed of in Spain, unless at the time of shipment an agreement, taking into account the criteria established by the Commission in accordance with Directive 2006/117/Euratom, has entered into force between the Spanish State and another Member State or a third country to use a disposal facility in one of them.

✓ It sets out the informational requirements of the Commission established in Directive 2011/70/Euratom (a report on the implementation of this Directive every three years and notification of the content of the GRWP) in addition to regular self-assessment of the national framework, the regulatory authority and the General Radioactive Waste Plan and peer reviews of the above at least every ten years.

✓ Beyond the scope of application of the Directive, the Royal Decree also regulates the dismantling of nuclear facilities, since this is classed as an essential public service under the terms of the NEA.

Lastly, it amends the Regulation of Nuclear and Radioactive Facilities[1] (RINR) in two respects:

✓ It creates a new authorisation for the dismantling and closure of disposal facilities for spent nuclear fuel and radioactive waste, detailed in Article 19.4 of this Report.

✓ It includes the obligation to provide proportionate guarantees covering the costs and contingencies which may arise from the processes of dismantling and decommissioning or closure of nuclear or radioactive facilities from the period when resources were not covered by the Fund for the financing of activities included in the General Radioactive Waste Plan, detailed in Article 22.2 of this Report.

[1] *Approved by Royal Decree 1836/1999 of 3 December and amended by Royal Decree 35/2008 of 18 January, Royal Decree 1308/2011 of 26 September and Royal Decree 102/2014 of 21 February.*

Order IET/1946/2013 of 17 October regulating the management of waste produced in activities using materials which contain naturally occurring radionuclides

This order sets out the values for concentrations of activity (exemption and declassification levels) which, if not surpassed, allow the direct conventional management of waste arising from work activities involving sources of naturally occurring sources of radiation (those defined as NORM, 'Naturally Occurring Radioactive Materials') with no radiological restrictions. Moreover, if by means of a radiological impact study, the short or long term conventional management of this waste can be guaranteed not to surpass a dose of 1 mSv/year for the public and 6 mSv/year for workers, this management can be carried out in accordance with the relevant regulatory framework, regardless of the need or lack of need to implement corrective or protective radiological measures.

The determination of the levels mentioned above has taken into account the European Union recommendations on activities involving the production or management of NORM waste included in the document 'Radiation Protection 122 Part II' (RP-122 II): 'Application of the concepts of exemption and clearance to natural radiation sources'.

Royal Decree 1308/2011 of 26 September on the physical protection of nuclear facilities and materials and radioactive sources

This Royal Decree addresses the necessary fulfilment of commitments made by Spain concerning the physical protection of nuclear materials and facilities (including the facilities defined by the current Convention as spent fuel management facilities and some of the radioactive waste management facilities). It has particular reference to: the Amendments to the Convention on the Physical Protection of Nuclear Material, approved in July 2005; the ratification in January 2007 of the International Convention for the Suppression of Acts of Nuclear Terrorism; Resolution 1540 (2004) of the United Nations Security Council, regarding the non-proliferation of weapons of mass destruction; the Global Initiative to Combat Nuclear Terrorism, launched at the G8 Summit of June 2006; and the Code of Conduct on the Safety and Security of Radioactive Sources approved by the IAEA. It also builds on the experience acquired in the application of Royal Decree 158/1995, now repealed, of 3 February on the physical protection of nuclear material.

The following are some of the developments included in this Royal Decree:

- ✓ Increased physical protection measures for nuclear facilities and materials;
- ✓ Revision of the authorisation system in force for nuclear materials and facilities, separating the treatment of authorisations corresponding to facilities and those relating to the transport of nuclear material;
- ✓ The establishment of a physical protection system for the radioactive sources of most concern, determining in which cases it is obligatory to have a specific system of physical protection for transport;
- ✓ More specific delimitation of the basic obligations of the license holders of physical protection authorisations, as regards both the control and protection of materials, facilities and shipments subject to regulation and the security classification criteria for facility and transport personnel;
- ✓ Reinforcement of control and supervision measures for companies involved in the transportation of nuclear and radioactive materials;
- ✓ The determination by the authorities of the Design Basis Threat (DBT);

- ✓ The obligation of the competent authority to establish procedures for the adequate protection of information on physical protection;
- ✓ The clear delimitation of competences amongst the authorities involved in this area;
- ✓ The creation of a registry of entities that undertake transportation requiring physical protection measures;
- ✓ The determination of response plans for incidents involving the illicit trafficking of nuclear materials, setting out the point of contact with the IAEA.

19.3 Developments in the legal provisions of the Nuclear Safety Council

The regulatory capacities of the CSN are set out in Article 2 of Law 15/1980 of 22 April. This is the law by which the CSN was created and which empowers it to propose to the Government all necessary regulations relating to nuclear safety and radiological protection, along with any revisions it considers to be appropriate. It may also draw up and approve technical Instructions, Circulars and Guides for nuclear and radioactive facilities and activities relating to nuclear safety and radiological protection, as well as on the physical protection of nuclear and radioactive facilities and materials. These functions are described in greater detail in the CSN Statute (Royal Decree 1440/2010).

Instructions are mandatory regulations; Circulars and Guides are technical documents of a recommendatory and informative nature.

Since 2011, 3 new Instructions have been published which affect the scope of the Convention:

1. Nuclear Safety Council Instruction IS-31 of 26 July 2011 on criteria for the radiological control of waste materials generated in nuclear facilities.

   Its aim is to establish criteria for the radiological control of waste materials before their release from the radioactive waste areas of nuclear facilities to enable their subsequent conventional management. It also determines the technical documentation that must accompany authorisation applications for the declassification of waste materials. It is applicable to nuclear facilities which are operational or undergoing dismantling.

2. Nuclear Safety Council Instruction IS-34 of 18 January 2012 on criteria relating to measures for radiological protection, reporting of nonconformities, availability of persons and resources in emergencies and load monitoring during the transport of radioactive material.

   Its purpose is to establish CSN criteria on actions during the transportation of radioactive material with respect to: measuring contamination levels of road vehicles; surveillance of vehicles and their loading, unloading and delivery operations for radioactive packages; and the availability of persons and resources for assistance in transport emergencies. Notifications are made to the CSN Emergency Room (SALEM).

3. CSN Instruction IS-35 of 4 December 2013 concerning the treatment of design modifications of transport packages for radioactive material with a certificate of approval of Spanish origin and of physical or operational modifications to packages carried out by the sender.

   It also applies to the treatment of intended modifications to the design of the transport package for double usage spent fuel containers. If these modifications affect the de-

sign of their storage casks, their treatment must be regulated as established in CSN Instruction IS-20 setting out the safety requirements for spent fuel storage casks.

19.4 Other aspects of the regulatory framework

✓ **Authorisation system for facilities:**

The authorisation system has been modified only by the inclusion in the RINR, by means of Royal Decree 102/2014, of a new authorisation for disposal facilities for spent nuclear fuel and waste: the authorisation for dismantling and closure. For this purpose, 'closure' is defined as 'the completion of all operations at some time after the emplacement of spent fuel or radioactive waste in a disposal facility, including the final engineering or other work required to bring the facility to a condition that will be safe in the long term'.

This authorisation entitles the licensee of disposal facilities for spent nuclear fuel and radioactive waste to begin the final engineering or other work required to ensure the long term safety of the storage system. It also authorises dismantling activities on determined auxiliary installations, ultimately enabling the delimitation of areas which must be subject to radiological or other types of surveillance and monitoring, as appropriate, during a specific period of time, and the release from control of the remaining areas of the site. The dismantling and closure process is finalised by a statement of closure issued by the Ministry of Industry, Energy and Tourism, subject to report by the Nuclear Safety Council.

Furthermore, Royal Decree 102/2014 provides for the regulation, by means of Nuclear Safety Council Instructions, of aspects of nuclear safety and radiological protection during the dismantling and closure of the facility and during the post-closure surveillance and monitoring phase, including the scope and content of the safety demonstrations or studies at each stage.

With the exception of the modification above, the authorisation system for nuclear and radioactive facilities remains essentially the same as that used previously and which is detailed in Annex B.

✓ **System for the inspection and assessment of nuclear and radioactive facilities:**

Law 15/1980 of 22 April, creating the CSN, amended by Law 33/2007 of 7 November, sets out the functions of the CSN as the responsible body for nuclear safety and radiological protection. Among these functions is the inspection of nuclear and radioactive facilities during the various phases from design to decommissioning. In this final phase, the CSN is responsible for the inspection of the plans, programmes and projects required for the management of radioactive waste.

Alongside these inspection activities, the CSN carries out assessments of facilities. The CSN submits the corresponding reports to the MINETUR, which in turn must adopt resolutions on the basis of these reports in order to grant authorisations for nuclear and radioactive facilities, as well as for all activities relating to the handling, processing, storage, disposal and transport of nuclear and radioactive substances. The records of inspections carried out by the CSN are published on its website, following removal of any data that might affect legal confidentiality or that cannot be disclosed for reasons including legal protection, impact on the privacy of individuals, national defence and public security, commercial or industrial secrecy, intellectual property rights and the existence of ongoing penalty or disciplinary procedures.

✓ **Penalty system for nuclear facilities:**

The penalty system relating to nuclear energy is set out in Chapter XIV (Articles 85 to 93) of Law 25/1964, under the terms of Law 33/2007, which includes a more specific and improved description of cases constituting offences, updating the ceiling for penalties and revising certain technical criteria applicable in determining the type of penalties and specific procedural aspects of the administrative process of penalty proceedings. The main elements of the penalty system were described in the Third National Report.

The CSN is one of the bodies responsible for proposing the initiation of penalty proceedings in the case of events potentially constituting offences in matters of nuclear safety, radiological protection and security. It is required to notify the MINETUR Directorate General for Energy Policy and Mines, which is the authority responsible for initiating proceedings. When penalty proceedings have been initiated which are not at the proposal of the CSN, or when they result from such proposals but involve additional information to that provided by the CSN, the CSN shall issue a mandatory report within 3 months to enable the adequate classification of the events.

The maximum timescale for processing and notification of the decision on the proceedings by the sanctioning body is 1 year, allowing for the possibility of a suspension of up to three months if the CSN is required to issue a report after the procedure has been initiated.

✓ **Assignment of responsibilities:**

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

The competences and functions of the MINETUR in matters of nuclear energy have not altered during the period of the report, and are those set out in Royal Decree 344/2012 of 10 February on the basic organisational structure of the Ministry of Industry, Energy and Tourism, repealing Royal Decree 1226/2010 of 1 October. These functions have not undergone any relevant modifications, as described in Section 20.1 of this Report.

With regard to the Nuclear Safety Council, there have been no substantial modifications to its competences and functions in general terms, as set out in the Law by which it was created and further developed through the CSN Statute, approved by Royal Decree 1440/2010 of 5 November, as described in Section 20.2 of this Report.

Finally, as mentioned above, the management of radioactive waste, including spent fuel and the dismantling and decommissioning of facilities, constitutes an essential public service for which the State is responsible. ENRESA is commissioned to carry out this service as an independent resource and technical service of the Administration, by virtue of Article 38a of the Nuclear Energy Act, under the terms of Law 11/2009. ENRESA's responsibilities are those set out in Royal Decree 102/2014, with no significant changes from those set out in Royal Decree 1349/2003, which it repealed and replaced. These responsibilities relate to the field of radioactive waste management in all its forms, including the dismantling and decommissioning of nuclear facilities and related activities, such as the management of the Fund for financing of the GRWP, the development of research and development plans, the establishment of systems for waste collection, transfer and transport, the performance of technical and economic studies and intervention in the event of nuclear and radiological emergencies, in support of the competent authorities.

Article 20
Regulatory body

Article 20. Regulatory body

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 fulfill 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 from other functions where organizations are involved in both spent fuel or radioactive waste management and in their regulation.*

In Spain, under the provisions of current legislation and acting in accordance with their respective competences within the scope of application of the Convention, the following authorities are responsible for regulatory functions in the field of nuclear energy:

- ✓ **The Government**, responsible for defining energy and radioactive waste management policy and for issuing legislation at the proposal of the relevant competent ministries.
- ✓ **The Ministry of Industry, Energy and Tourism (MINETUR)**, which is the Central Government ministerial department responsible for granting, modifying, suspending or withdrawing authorisations for nuclear and radioactive facilities[1]. This is subject to mandatory and, where appropriate, binding[2] reports from the Nuclear Safety Council (CSN) on matters of nuclear safety and radiological protection, as well as to the necessary reports issued by different Central Government Departments or Bodies on other matters, in accordance with the requirements of their specific regulations[3]. This Ministry is also responsible for submitting to the Government regulatory proposals for the development of the legislation in force, adopting provisions enacting Government regulations and applying the penalty system for nuclear energy.
- ✓ The Governments of the **Autonomous Communities** with executive functions which have been transferred to them by the MINETUR, by virtue of a legal provision[4].
- ✓ **The Nuclear Safety Council (CSN)**, which in accordance with the law by which it was created (Law 15/1980 of 22 April, amended by Law 33/2007) is the sole competent body of the State in matters of nuclear safety and radiological protection. It is a public law entity independent of the State General Administration, with its own legal capacity and equity.

[1] *In the case of 2nd and 3rd category radioactive facilities, the Autonomous Communities are responsible for the executive functions of the MINETUR when these functions have been transferred to them by legal provision.*

[2] *The CSN reports are binding both in the case of refusal and regarding limits and conditions imposed if favourable.*

[3] *The regulation of the physical protection of nuclear materials is shared between the MINETUR, the Ministry of the Interior and the CSN, and each institution is responsible for exercising the corresponding functions in accordance with its respective realm of competence. The legislation in force sets out that the Ministry of the Interior and the CSN shall submit reports to the MINETUR prior to the granting of physical protection authorisations by the MINETUR.*

[4] *Specifically, the Autonomous Communities of Catalonia, the Basque Country, the Balearic Islands, Murcia, Extremadura, Asturias, Madrid, Galicia, Cantabria, the Canary Islands, Ceuta, Navarra, Valencia, Castile-Leon, La Rioja and Aragón.*

In exercising the competences and functions established by this legislation, the CSN must maintain contact with Parliament (Congress and Senate) and the Government, as well as with the competent ministerial departments and the Governments of the Autonomous Communities.

As regards relations with Parliament, the competent Congress Commission monitors CSN activities, by means of reports issued annually by the CSN and through appearances made periodically and at the request of the Congress or the request of CSN, in order to report on relevant matters. The Commission may also summon the appearance of other public authorities or entities connected with nuclear energy. As a result of these appearances, the Congress may, by proposal of the Commission, call on the Government, the MINETUR or the CSN, depending on the matter in hand, to establish certain measures or initiate regulatory proceedings. Similarly, the CSN appears before the competent Senate Commission, at their request or its own, to report on matters included within its realm of competence.

The CSN is connected to the Government fundamentally through the MINETUR (in accordance with Royal Decree 344/2012 of 10 February), for all matters relating to the authorisation procedures for all phases of site selection, construction, startup, operation and dismantling of nuclear and radioactive facilities. The MINETUR is responsible for requesting the mandatory, and sometimes binding, reports issued by the CSN on nuclear safety and radiological protection matters prior to the granting of any type of authorisation for facilities. The CSN proposes to the Government new regulations and the revision of current regulations on nuclear safety, radiological protection and the physical protection of facilities and nuclear and radioactive materials, in cooperation with the competent authorities, as well as those required in accordance with international obligations entered into in this area. Likewise, the CSN may propose the initiation of any relevant penalty proceedings.

The CSN also maintains contact with other ministerial departments, in the interests of both the better performance of its functions and cooperation in areas of common interest. Besides the MINETUR, the main ministerial departments with which the CSN maintains contact are the following:

- ✓ The Ministry of Agriculture, Food and the Environment: The CSN is involved in the procedure for the Environmental Impact Statement in matters relating to the assessment of environmental radiological impact of facilities with potential for this type of impact.
- ✓ The Ministry of the Interior and Ministry of Defence, with regard to the management of emergencies, physical protection and civil defence in response to radiological risk.
- ✓ The Ministry of Education, Culture and Sport, regarding the training of secondary school teachers.
- ✓ The Ministry of Health, Social Services and Equality: The CSN cooperates with the Ministry in matters concerning radiological protection (protection of patients, workers, the public and the environment).
- ✓ The Ministry of Development, on matters such as combating marine contamination, technical building regulations, etc.
- ✓ The Ministry of the Economy and Competitiveness, to which the CIEMAT (Centre for Energy-related, Environmental and Technological Research) is attached.

Furthermore, it is important to note that both the MINETUR and the CSN maintain contact, within their respective realms of competence, with the Governments and Parliaments of the Autonomous Communities.

Firstly, as regards the MINETUR, Spanish legislation provides for the possibility that certain competences corresponding to the Central Government may be transferred to the Autonomous Communities. As has been pointed out above, various Autonomous Communities exercise exec-

utive functions originally attributed to the MINETUR through the Regulation on Nuclear and Radioactive Facilities[1] (RINR) in relation to 2nd and 3rd category radioactive facilities. Additionally, the MINETUR is obliged to transfer information submitted in facilities' requests for authorisation and requests for transfer of authorisations to the Autonomous Communities where these facilities are located, or whose territory is part of the area of operations of a facility's Nuclear Emergency Plans, so that they may make appropriate representations.

Secondly, as regards the CSN, in accordance with the provisions of Law 15/1980, under the terms of Law 33/2007, the Council may concede to the Autonomous Communities the exercise of its own assigned functions, in accordance with the general criteria agreed by the CSN for these purposes. These assignment agreements are without prejudice to the exercise of competences attributed to the CSN in the legislation, which remain its responsibility. Currently, the CSN has assignment agreements with the Autonomous Communities of Asturias, the Canary Islands, Catalonia, Galicia, the Balearic Islands, Murcia, Navarra, the Basque Country and Valencia.

In accordance with the reform introduced by Law 33/2007 of 7 November, reforming Law 15/1980 on the CSN, a representative of the Autonomous Communities in which nuclear facilities are located or that have assignment agreements with the CSN shall form part of the 'Advisory Committee on public participation and information involving nuclear safety and radiological protection'.

Finally, it should be added that in accordance with the CSN Statute, the Council shall immediately inform the Government, Congress and Senate, and relevant Regional Governments and Parliaments and Local Councils of any circumstance or event affecting the safety of nuclear and radioactive facilities or the radiological levels of the environment anywhere within the national territory. Furthermore, the CSN shall submit an annual report on its activities to the Parliaments of those Autonomous Communities with nuclear facilities within their territory.

20.1 Structure, competences and functions of the Ministry of Industry, Energy and Tourism

20.1.1 Organisational structure

The current basic organisational structure of the ministerial departments of the Government was established by Royal Decree 1823/2011 of 21 December, amended by Royal Decree 1887/2011 of 30 December, assigning the following higher-level state bodies to the MINETUR:

- ✓ The Secretariat of State for Energy
- ✓ The Secretariat of State for Tourism
- ✓ The Secretariat of State for Telecommunications and the Information Society
- ✓ The Sub-secretariat for Industry, Energy and Tourism
- ✓ The General Secretariat for Industry and Small and Medium-sized Enterprises

The basic organisational structure of the MINETUR is set out in Royal Decree 344/2012 of 10 February, which repeals the previous Royal Decree 1226/2010 of 1 October. It establishes that the Secretariat of State for Energy is the higher-level governing body in energy matters and that, within this Secretariat, the Directorate General for Energy Policy and Mines (DGEPM) is the

[1] *Approved by Royal Decree 1836/1999 of 3 December and amended by Royal Decree 35/2008 of 18 January, Royal Decree 1308/2011 of 26 September and Royal Decree 102/2014 of 21 February.*

governing body responsible for the specific field of nuclear energy, the functions of which are detailed in the following section.

Within the DGEPM, the Sub-directorate General for Nuclear Energy (SGNE) is responsible for the practical performance of these functions. In addition, the SGNE is connected to other MINETUR governing bodies and general services, integrated both inside and outside the Secretariat of State for Energy, in the exercise of its functions. These include the Technical Secretariat General for the processing of legislative proposals, the Public Prosecutor's Office for legal advice and support, and the Sub-directorate General for International Relations and Cooperation with regard to relations with Spain's Permanent Representations to the International Organisations specialising in nuclear energy. It is also connected to the new Sub-directorate General for International Energy Relations, created for the undertaking of functions including the coordination and management of international energy-related matters and processes, participation in various international forums, involvement in the drawing up of European Community regulations and the monitoring of Community energy policies (including nuclear).

Section L, Annex G of this report includes an organisational chart of the MINETUR, highlighting those bodies responsible for functions relating to the Convention, together with a block diagram of the structure of the functional areas and services of the SGNE.

20.1.2 Competences and functions

In accordance with the current legal system, the MINETUR is one of the authorities with competences and functions within the Spanish regulatory system in matters of energy, and specifically in matters of nuclear energy. It should be made clear that the production of electrical energy in Spain is fully liberalised, as a result of which, as has been indicated above, the Government's activities via the MINETUR are limited to establishing an indicative energy plan and regulating the various energy sectors. Consequently, the MINETUR does not perform any function in the development or the promotion of nuclear energy.

The nuclear energy related competences conferred on the various bodies have not been substantially modified with respect to the Fourth National Report. Under the provisions of Royal Decree 344/2012, the MINETUR exercises the following competences and functions, which fall within the scope of the Joint Convention:

i. It grants authorisations for nuclear and radioactive facilities, except in the case of second and third category radioactive facilities located in Autonomous Communities with executive functions which have been transferred to them by the Central Administration, subsequent to a favourable report by the CSN.

ii. It draws up regulatory proposals and applies the penalty system established in Law 25/1964, the Nuclear Energy Act of 29 April. When regulatory developments refer to nuclear safety or radiological protection, the CSN is responsible for drawing up proposals.

iii. It manages the administrative records (in relation to transport of nuclear and radioactive materials, radioactive facilities, activities relating to the commercialisation of radioactive materials and devices, etc.).

iv. It defines the radioactive waste management policy.

v. It contributes to defining R&D policy, in coordination with the Ministry of the Economy and Competitiveness. To this end, the Strategic Committee on Nuclear Energy R&D, CEIDEN, was set up in 1999 at the initiative of the MINETUR. This was the predecessor to the current Nuclear Fission Energy R&D Technology Platform which goes by the same name. Its aim is to bring together the different agents involved in the

nuclear energy sector, including, besides MINETUR itself, the CSN, universities and research centres, operators and industry associations, in order to identify synergies and points of common interest in their research activities and programmes and to participate in international programmes[1].

vi. It monitors compliance with the international commitments entered into by Spain in the field of nuclear energy, particularly in matters of non-proliferation and civil liability for nuclear damage.

vii. It is connected to International Organisations specialising in nuclear energy through the SGNE (within the scope of the Euratom Treaty and related committees and working groups, within the framework of the IAEA and the OECD's Nuclear Energy Agency, with regard to the European Bank for Reconstruction and Development and the European Nuclear Energy Forum, etc.).

20.1.3 Human resources and training

The SGNE, which is the Sub-directorate General responsible for exercising the functions of the MINETUR in relation to nuclear energy, is staffed entirely with civil servants belonging to various bodies of the State Administration. The usual system for access to employment in the various units of the MINETUR, including the SGNE, as part of public sector employment opportunities, is via a competitive examination followed by a selective training course. In addition, posts may be covered within the SGNE by the transfer of civil servants from other areas of the State General Administration, provided the areas from which the workers are transferred are compatible with those required for the vacancies to be covered in the MINETUR.

At present the SGNE has a staff of 11. Of the civil servants currently assigned to the SGNE, 72% hold university degrees, most of them industrial engineers from the State Division of Industrial Engineers, although there are also others with different academic qualifications in areas such as forestry and law. There is a balanced distribution of the workforce in terms of knowledge and experience of administrative matters and nuclear technology, which meets the needs of the service.

The budget of the Directorate General for Energy Policy and Mines, the governing body to which the SGNE belongs, is integrated within the General State Budget, in the same way as that of any other organisational unit of the Ministerial Departments of the State Central Administration.

The training scheme for SGNE personnel is incorporated into the MINETUR's general training plan, which takes into account training both on technical issues relating to energy and on administrative, legal and economic matters.

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

20.2.1 Organisational structure of the CSN

Law 15/1980 of 22 April, creating the Nuclear Safety Council, and Royal Decree 1440/2010 of 5 November, approving the organisational structure of the CSN, set out the following structure:

[1] *CEIDEN currently includes some 90 representative entities and six partner entities. Its Presidency is renewable every two years and is currently occupied by the CSN.*

- ✓ Presidency
- ✓ Plenum, formed by four councillors, one of whom is the vice-president
- ✓ The Technical Directorate for Nuclear Safety and its Sub-directorates.
- ✓ The Technical Directorate for Radiological Protection and its Sub-directorates.
- ✓ The Secretariat General, to which the following Sub-directorates and Units report:
  - ➪ Sub-Directorate General for Personnel and Administration
  - ➪ Sub-Directorate for Information Technology
  - ➪ Sub-Directorate for Legal Advisory Services
  - ➪ Planning, Assessment and Quality Unit
  - ➪ Inspection Unit
  - ➪ Research and Knowledge Management Unit

Section L, Annex G of this report includes an organisational chart of the CSN.

The higher-level governing bodies of the CSN are the Plenum and the Presidency, which act in the exercise of their respective competences, at the same hierarchical level. The Plenum is composed of a president and four councillors, designated from amongst individuals with proven reliability in matters for which the CSN is responsible. The president and the councillors are appointed by the Government, by means of Royal Decree, subsequent to their appearance before the Lower House of Parliament for assessment of their capabilities.

Under the management of the Presidency and the Plenum is the Secretariat General. Its responsibility, under the immediate control of the president and within the framework of the agreements adopted by the Plenum and the directives issued by its internal committees, is the provision of services common to the CSN. The chief officer of the Secretariat General acts as secretary to the Plenum, attending its sessions, with the right to be heard but not to vote.

Other governing bodies of the CSN, besides the Technical Directorate of the Presidency, are the two following Technical Directorates:

- ✓ The Technical Directorate for Nuclear Safety, which incorporates all functions relating to the safety of nuclear facilities, except those of low and intermediate level radioactive waste disposal, for which the Technical Directorate for Radiological Protection is responsible. It is also responsible for safety in the transport of nuclear substances and radioactive materials. Three Sub-directorates report to this Technical Directorate: Nuclear Facilities; Engineering; and Nuclear Technology.
- ✓ The Technical Directorate for Radiological Protection, which, besides the inspection and control of radioactive facilities, radiological protection of workers and management of low and intermediate level radioactive waste, is responsible for the radiological protection of the public and the environment and for radiological and nuclear emergencies and physical security. Three Sub-directorates report to this Technical Directorate: Environmental Radiological Protection; Operational Radiological Protection; and Emergencies and Physical Protection.

20.2.2 Competences and functions of the CSN

The CSN is a Public Law Entity with its own legal capacity and equity and is independent from the General Administration of the State. It is the sole body responsible for nuclear safety and radiological protection in Spain.

The functions of the CSN are listed principally in Article 2 of Law 15/1980 and in Title I of its Statute, without prejudice to those competences that are included in other regulations. As regards the scope of the Convention, the functions of the CSN can be summarised as follows:

1) It issues mandatory reports to the MINETUR on authorisations for nuclear and radioactive facilities, and for all activities relating to the handling, processing, storage and transport of nuclear and radioactive substances. It also issues reports prior to the resolutions issued by the MINETUR in exceptional cases and circumstances in relation to the safe removal and management of radioactive materials.

2) It reports to the MINETUR on the concentrations or levels of activity present in materials containing or incorporating radioactive substances and for which no further use is foreseen, in order for them to be considered as radioactive waste.

3) It proposes to the Government the necessary regulations within its realm of competence. It also draws up and approves technical Instructions, Guides and Circulars in relation to nuclear safety and radiological protection.

4) It proposes the initiation of penalty proceedings within its realm of competence. Likewise, when penalty proceedings relating to nuclear safety, radiological protection or physical protection involve data additional to that provided by the CSN, the Council will issue a mandatory report within a period of 3 months for the appropriate evaluation of the facts. This is the case whether the proceedings are initiated by another organisation or by means of a reasoned request from the CSN itself. Penalties are imposed by the executive body of the Central Government or of the Governments of the Autonomous Communities.

   The CSN is also empowered to issue warnings to licensees, propose corrective measures and, where appropriate, apply coercive fines.

5) It is responsible for the surveillance and monitoring of nuclear and radioactive facilities, carrying out inspections and monitoring on these facilities throughout all phases of their lifetimes. It inspects the transport, manufacturing and certification of equipment involving radioactive sources or generating ionising radiations, and the approvals and validations for packages for the transportation of radioactive substances.

   It also monitors and controls the radiation doses received by operating personnel and the off-site releases of radioactive materials from nuclear and radioactive facilities, as well as their specific or cumulative impacts on the areas affected by these facilities.

6) It conducts studies, assessments and inspections of the plans, programmes and projects required for all phases of radioactive waste management, including new designs.

   It will also issue a preliminary report on the new General Radioactive Waste Plan, which the MINETUR submits to the Government for approval.

7) It maintains official relations with similar organisations in other countries and participates in international organisations with competences in the fields of nuclear safety and radiological protection, advising the Government on commitments to these organisations or to other countries.

8) It informs the public about matters for which it is responsible, without prejudice to the public notification of its administrative activities under the legally established terms.

   The CSN is obliged to inform the public of all relevant events concerning nuclear and radioactive facilities. The reports which it issues and the records of inspections which it carries out are made public and there is public consultation during the development stage of CSN Technical Instructions and Guides.

9) It collaborates with the competent authorities in the development of the criteria to which off-site emergency plans and physical protection plans for nuclear and radioactive facilities must conform.

   It coordinates emergency situation support and response measures for all aspects relating to nuclear safety and radiological protection.

   It inspects, assesses, monitors, proposes and adopts all necessary prevention and correction measures in the event of exceptional situations or nuclear or radiological emergencies, when these result from facilities, equipment, companies or activities not subject to the nuclear legislation authorisation system.

10) It establishes and carries out monitoring of research plans relating to nuclear safety and radiological protection.

11) It archives and safeguards the documentation which must be submitted to the Nuclear Safety Council by the licensees of operating permits for nuclear facilities in the event of the definitive shutdown of operation and prior to the transfer of ownership and to the granting of the dismantling permit.

20.2.3 CSN INTERNATIONAL RELATIONS

International relations play a fundamental role in the exercising of and compliance with the functions assigned to the CSN by the current national legal system. The CSN's international activities are carried out on two levels: multilateral, via international organisations, institutions and forums; and bilateral, through agreements with counterpart institutions.

The CSN's most important activity in the field of multilateral international relations is its involvement in the governing bodies, committees and working groups of various international organisations, such as the International Atomic Energy Agency (IAEA) and the Nuclear Energy Agency (NEA/OECD), as well as within the framework of European Union (EU) institutions. The CSN also collaborates with international non-governmental organisations, such as the International Commission on Radiological Protection (ICRP).

During this period the CSN has participated in activities relating to compliance with Spain's commitments as a contracting party to the following international Conventions:

- ✓ The Convention on Nuclear Safety, acting as a national point of contact and coordinating the production of national reports for Review Meetings;
- ✓ The Joint Convention, cooperating with the MINETUR in the production of national reports;
- ✓ The Convention on the Physical Protection of Nuclear Materials;
- ✓ The OSPAR Convention;
- ✓ The Convention on Early Notification of a Nuclear Accident;
- ✓ The Convention on Assistance in the Case of a Nuclear Accident or Radiological Emergency.

Furthermore the CSN participates in the following nuclear regulatory groups and associations:

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

As regards bilateral relations, the CSN has signed agreements with numerous counterpart organisations and cooperates with them in activities in the fields of nuclear safety, radiological protection and waste management.

The CSN actively participates in the IAEA's technical cooperation programme, providing experts for participation in seminars, fostering fellowships, hosting scientific visits by foreign experts and organising activities in Spain on the safe management of radioactive waste.

20.2.4 CSN HUMAN RESOURCES, TRAINING AND FINANCING

Human resources:

The CSN, as the organisation responsible for an issue such as nuclear safety and radiological protection, needs technical personnel with expertise in this area. This technical staff is composed of civil servants belonging to the Nuclear Safety and Radiological Protection Division, as established in Article 8 of Law 15/1980, creating the CSN. Access to the Division is gained by means of a competitive examination held by the CSN. In addition to the technical staff, Council personnel also includes civil servants from other Public Administration Divisions, temporary staff and auxiliary staff.

As of 31 December 2013, and including the eight members of the upper management (President, four Counsellors, Secretary General and two Technical Directors), the CSN workforce is made up of 449 people, of which 211 are civil servants from the Nuclear Safety and Radiological Protection Division, responsible for the inspection, control and monitoring of the operation of nuclear and radioactive facilities, 137 are civil servants from other Public Administrations, 21 are temporary personnel from the Technical Office of the Presidency and 69 are auxiliary staff.

The number of women employed by the CSN represents 51% of the total workforce, and men the remaining 49%. The average age of CSN personnel is 51.

As regards academic qualifications, 68.82% of the personnel are graduates, 6.46% have intermediate-level qualifications and 24.72% have other qualifications.

CSN Staff Training Plan:

In 2011, there were 110 training courses held, amounting to 53,779 hours, or 4% of working hours. Expenditure on training tasks amounted to 491,521 €. In 2012, in accordance with Law 2/2012 on State General Budgets for that year, the budget set aside for training was halved. 142 courses were held, amounting to 26,483 hours, or 3% of working hours. Expenditure on training activities was 413,039 €. In 2013, there were 99 training courses held, amounting to 29,716 hours, or 3% of working hours. Expenditure on training tasks amounted to 528,648 €.

In accordance with the skills-based management model applied to training, in 2011, a new assessment process was completed. For this, the training requirements of 86% of the CSN workforce were individually assessed. The results have been used as the basis for the design of subsequent training plans.

Training is of great importance to the CSN, and therefore training plans are dynamic. Thus, those developed for 2012 and 2013 responded to the needs identified by the skills-based assessment system, but were also influenced by other events such as the Fukushima accident, the government's decision in 2012 on the siting of the CTS and the appointment of a new management team. Fukushima entailed an unforeseen increase in the workload which required the postponement of a large part of the training activities for 2012 and 2013, at the same time as new training actions have become necessary.

The Training Plans for 2011, 2012 and 2013 were drawn up in line with the CSN's strategic plans for the 2011-2016 period, grouping their content around seven training schemes:

1. Technical upgrading and retraining
   Nuclear Safety subprogramme
   Radiological Protection subprogramme
   Support Areas subprogramme
2. Management Development
3. Administrative Management
4. Prevention
5. IT
6. Languages
7. Skills

Efforts are ongoing in the promotion of the presence of the Council in national and international forums (congresses, meetings, seminars, etc.) related to its functions and areas of competence.

Financing:

The budgets for CSN income and expenditure are included in the General State Budget, and as such, they are approved by Parliament. The two most important items of the budget as regards income are the tariffs, fees for services and other revenues that the CSN receives as payment for its services and, to a noticeably different degree, transfers made by the State. This contribution has become greatly reduced through the implementation of fiscal adjustment and consolidation policies. As a consequence, the current financing of the CSN originates almost exclusively from its own resources.

a) Tariffs, fees for services and other revenues are regulated by Law 14/1999 of 4 May, on tariffs and fees for services rendered by the Nuclear Safety Council. The tariffs which bring in most revenue are those obtained from:

   ✓ The undertaking of studies, reports and inspections prior to authorisations for the operation and decommissioning of nuclear and radioactive facilities granted by the MINETUR.

   ✓ The inspection and monitoring of nuclear and radioactive facilities and related activities.

   ✓ The granting of licences for the personnel who will operate or supervise the operation of nuclear and radioactive facilities.

Financed through fees for services are the reports, tests and studies on new designs, methodologies, simulation models and verification protocols relating to nuclear safety and radiological protection.

This section of financing represents 99% of the total budget.

b) Transfers from the State. The CSN carries out monitoring of radiological protection measures for the general public and the environment. These functions do not constitute taxable events covered by tariffs and fees for services but are funded from the General State Budget via the MINETUR. The financing set aside for this constitutes approximately 1% of the total budget.

20.2.5 CSN management system

The CSN has implemented a process-oriented Management System based on the requirements of the IAEA (GS-R-3) and ISO 9001:2008. The processes, which cover all the activities of the Council, have been classified as follows:

- ✓ Strategic, including the functioning of the Plenum, information and communication, and regulatory development.
- ✓ Operational, including the authorisation, assessment, supervision and control of facilities and activities (including transport); licensing of personnel; radiological protection of workers, the public and the environment; emergency management and physical safety.
- ✓ Support, including institutional and international relations; research and development; economic management and human resources (including training); information systems; documentation; and administration of the Management System.

The documents describing the system are organised hierarchically: System Manual, Process Map, Organisation Manual and Procedures. All these documents, along with the information and documentation required to carry out regulatory activity, are available to all personnel via the CSN intranet, with some exceptions on the grounds of security or confidentiality.

The Management System is subject to ongoing improvement. In addition to assessing fulfilment of plans and objectives, the CSN has an internal audit scheme and is subject to external assessments by national and international organisations.

- ✓ The internal audit scheme sets out that all processes are audited at regularly established intervals, which range from two to five years depending on the importance of the process and the relevant legal requirements. There is a specific audit scheme for activities assigned to the Autonomous Communities.
- ✓ In addition to being subject to the economic and financial audits and monitoring required of all public bodies, the CSN is required to report systematically to the Spanish Parliament, and to the parliaments of the Autonomous Communities with nuclear facilities. Parliament is responsible for the continuous monitoring of CSN activities.

In early 2008, the CSN hosted an IRRS Mission. The mission brought with it the undeniable value of having a team of high level international experts evaluating the structure and regulatory practices of the CSN. No less valuable were the efforts made by the Council itself in self-assessment, systematisation and review during the years leading up to the mission, and the dynamic of ongoing improvement that was instilled in the organisation. A follow-up mission was carried out in 2011.

20.2.6 Independence of the regulatory body

The independence of the CSN is expressly regulated in the law by which it was created: 'The Nuclear Safety Council is created as a Public Law entity, independent of the State General Administration, with legal capacity and its own equity separate from the State's, and as the sole competent body in matters of nuclear safety and radiological protection. It will be governed by its own Statute, drawn up by the Council and approved by the Government and whose text will be transferred to the competent Commissions of the Congress and Senate before its publication, and by any specific provisions devoted to it, without prejudice to the further application of precepts of common or special legislation.'

This statement of independence is included in the CSN Statute, in the provisions of Article 2.4: 'The Nuclear Safety Council acts in the undertaking of its activities and for the fulfilment of its

objectives with organisational and functional autonomy, fully independent of the Public Administrations and interested parties. It is also subject to judicial and parliamentary control. Resolutions adopted by the Plenum and the President of the Nuclear Safety Council in the exercise of its assigned public functions bring administrative proceedings to a close'.

Furthermore, Article 8.2 of the Law creating the CSN authorises the following: 'The Council, in accordance with the regulations set out in the Statute, is permitted to contract the services of national or international organisations, companies and personnel, exclusively for the undertaking of specific studies or work, provided that it can be established that there is no connection with those affected by the contracted service. In no case will personnel outside the CSN be able to participate directly in the decision-making in ongoing administrative cases. The CSN shall establish the necessary measures to ensure that external personnel, companies and organisations respect the obligations of independence required for the provision of its services at all times'.

Likewise, according to the Law creating the CSN, reports issued by the CSN to the Ministry of Industry, Energy and Tourism regarding nuclear safety, radiological protection and physical protection, prior to the resolutions which MINETUR adopts for the granting of authorisations, will be mandatory in every case. They will also be binding whether they are negative and deny authorisation, or if they impose conditions when they are positive.

20.2.7 Transparency in regulatory activities and public access to information

The CSN strategic plan for the 2011-2016 period recognises the principle of transparency as one of its core values, based on the capacity to provide the public with relevant, valid and verifiable information on all matters concerning nuclear safety and radiological protection.

Law 15/1980 of 22 April, creating the CSN, amended by Law 33/2007 of 7 November, sets out the basis for this policy of transparency. It also incorporates aspects from the Aarhus Convention, ratified by Spain in 2004 and entering into the national legislation in Law 27/2006 of 18 July, regulating the rights of access to information, public participation and access to justice in environmental matters.

Moreover, the amendment to the Law creating the CSN in 2007 extended the requirements in matters of information for the public, with the aim of increasing the organisation's transparency and gaining greater public trust in the CSN's activities. The law sets out three channels for fulfilling this requirement:

- ✓ Transmission of information to State institutions:

  The CSN issues an annual detailed report on its activities to Parliament and to the parliaments of the Autonomous Communities with nuclear facilities within their territory. Likewise, and as part of its relations with Parliament, the CSN responds to parliamentary initiatives (oral and written questions, bills, etc.) and complies with the resolutions issued in response to the annual reports.

- ✓ Information committees in the vicinities of nuclear power plants:

  The legislation sets out that the CSN must promote and participate in information forums, chaired by MINETUR, in the vicinities of these facilities, in order to deal with aspects related to the monitoring and surveillance of nuclear and radioactive facilities and emergency preparedness. The functioning of these information committees is governed by the RINR, approved by Royal Decree 1836/1999 of 3 December and its subsequent amendments.

✓ Policy of public access to information:

Article 14 of Law 15/1980, creating the CSN, sets out the need to enable access to information and facilitate public and civil society participation. This involves the obligation to inform the communication media and interested parties of relevant events related to the functioning of facilities, focusing particularly on the reporting of events and incidents that might affect safety, their potential radiological impact on individuals and the environment, and the corrective measures to be implemented.

Along these lines, the CSN publishes on its website the inspection records for facilities, information on the operating status of nuclear power plants, and information on environmental quality measured by the Automatic Stations Network and the Environmental Radiological Surveillance Network. Alongside this, the records of meetings of the Council and technical reports forming the basis of Council decisions are also published. The CSN regularly updates its website with the results from the systematic assessment programme for plant operation, the Integrated Plant Supervision System, which incorporates innovative monitoring methods focused on observing the performance of operational nuclear power plants via performance indicators and the evaluation of findings from inspections carried out by the CSN.

In the event of any significant incident or occurrence at nuclear and radioactive facilities, news, summaries and press releases are published on the website. Alongside this, the CSN responds to direct requests for information from the media, as quickly as technical rigour allows.

With respect to public participation, the CSN must submit safety instructions and guides to public scrutiny during their development. To this end, there is an area of the corporate website through which comments can be made. Similarly, the MINETUR provides information on current legislation on matters of nuclear energy. It also submits plans for Royal Decrees and regulations to mandatory public scrutiny via their website.

✓ Advisory Committee for access to information and public participation

The Law creating the CSN sets out the constitution of an Advisory Committee for access to information and public participation, which began functioning on 23 February 2011. The aim of this committee is to issue recommendations to the CSN in order to improve transparency, access to information and public participation in the areas for which it is responsible.

The Advisory Committee is composed of representatives of the country's main interested parties, including Ministries, Universities, Professional Associations, entities from the electrical industries, mayors of the localities with nuclear power plants and NGOs.

✓ International communication

One of the CSN's strategic courses of action for the 2011-2016 period is the promotion of policies for institutional relations and communication with other organisations in the international arena. For this purpose, the CSN is actively involved in various international forums with the aim of exchanging experiences and technological and regulatory expertise in matters of nuclear safety and radiological protection, understanding best practices which enable the reinforcement of the safety of facilities in this country, and improving international coordination in emergency response plans.

✓ Other channels of communication

The CSN carries out a broad range of informational activities, both technical and informational, on subjects related to its purpose. Notable amongst these activities are the organisation of conferences, seminars and training activities and an extensive pub-

lishing schedule which includes the editing of *Alfa*, the Nuclear Safety and Radiological Protection journal.

In addition, the CSN has an interactive Information Centre which welcomes a highly significant number of visitors (recently reaching a total of 100,000 visitors), mostly from educational institutions and national and international institutional delegations.

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Section F

Other General Safety Provisions

Section F. Other General Safety Provisions

ARTICLE 21
RESPONSIBILITY OF THE LICENCE HOLDER

Article 21. Responsibility of the licence 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 IN RELATION TO SAFETY

Spanish legislation establishes as a basic principle that the prime responsibility for the safety of waste management facilities rests with the licence holder.

The legal precepts by which the responsibility of the licensee is assigned are included in Law 25/1964, the Nuclear Energy Act (NEA) and the Regulation on Nuclear and Radioactive Facilities[1] (RINR). From the point of view of civil liability for nuclear damage, the licensee of the facility is also identified as being responsible for providing compensation to the limit laid down in the legislation.

The NEA sets out that the licence holder for nuclear or radioactive facilities or activities involving ionising radiation shall be responsible for their safety. The licensee is defined as the natural or legal person wholly responsible for a nuclear or radioactive facility, as specified in the corresponding authorisation, and the NEA underlines that this responsibility may not be delegated.

The RINR in force sets out that in order to obtain the various authorisations, the applicant must submit details of the planned organisational structure for supervision of the project and quality assurance during the successive phases of the facility. It also requires that each of the positions in the operator's organisational structure and their respective responsibilities in matters of nuclear safety and radiological protection is described in detail. The projected organisational structure

[1] *Approved by Royal Decree 1836/1999 of 3 December and amended by Royal Decree 35/2008 of 18 January, Royal Decree 1308/2011 of 26 September and Royal Decree 102/2014 of 21 February.*

for the future operation of the facility and a preliminary plan for the training of operating personnel must also be submitted.

The RINR also indicates that the licensee of the facility is responsible for ensuring that all natural and legal persons involved as contractors or sub-contractors at the facility carry out their activities safely and in all cases in accordance with the requirements of the official documents.

Final Provision 2 of Royal Decree 1308/2011 of 26 September introduces an amendment to the RINR concerning required conditions for workers in the performance of their tasks in nuclear or radioactive facilities.

In accordance with this amendment, described in greater detail in Article 22.1 of this Report, the licensee of these facilities shall require all personnel providing services in these facilities whose functions are related to nuclear safety, radiological protection or physical protection to fulfil the mandatory conditions of physical and psychological suitability in order to safeguard nuclear and radiological security.

As regards radioactive waste, in accordance with the Nuclear Energy Act, the State will assume ownership of the radioactive waste once its disposal is undertaken. It will likewise undertake any monitoring necessary following the decommissioning of a nuclear or radioactive facility, once the period of time established in the corresponding declaration of decommissioning has elapsed.

21.2 Liability for nuclear damage

During the period covered by this report, no changes have been made to the system of civil liability 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 qualification of human resources

Legislative framework

Article 7 of Directive 2011/70/Euratom sets out that Member States shall ensure that the national framework requires licence holders to provide for and maintain adequate financial and human resources to fulfil their obligations with respect to the safety of spent fuel and radioactive

waste management. In addition to this obligation for licensees, Article 8 extends the obligation to provide education and training to all parties involved in radioactive waste management.

In this regard, Article 37 of Law 25/1964, the Nuclear Energy Act (NEA), had already established requirements in Spain for the availability and aptitude of personnel in nuclear and radioactive facilities, prior to the Directive. Similarly, the RINR, which regulates the administrative authorisation system, had already set out the organisational structure requirements that the licensee must submit for the various authorisations for facility licensing and for personnel licences and accreditations.

Extending beyond this obligation and the content of the Directive, in September 2011[1] a new section was added to Article 8 of the Regulation on Nuclear and Radioactive Facilities (RINR):

> *4. The licensee of radioactive or nuclear facilities or of activities involving ionising radiation will be responsible for their safety. To this end, the organisations responsible for the management of these facilities or activities must have available adequate human resources and/or materials in order to maintain their safety. Thus they must require all personnel providing services in these nuclear and radioactive facilities whose functions are related to nuclear safety, radiological protection or physical protection, or whose activities may interfere in the operation of the facility, to fulfil the mandatory conditions of physical and psychological suitability in order to safeguard nuclear and radiological security.*
>
> *To this effect, such personnel, irrespective of their legal relationship with the facility, shall be subject to monitoring and preventative testing for the detection of the consumption of intoxicating and narcotic substances, by means of certain tests administered under the management of professionally qualified staff. These tests shall be carried out in line with the proportionality principle and with minimum possible risk and maximum possible indemnity for the health of the person concerned. The subjects of the tests have the right to prior information about the tests and to be informed of their results, in all cases fully respecting their dignity, privacy and integrity.*
>
> *Timely communication will be given of the measures taken, for the notification of workers' representatives at the respective facility, respecting the confidentiality of the results.*
>
> *The provision set out in the previous paragraph is without prejudice to other corporate obligations deriving from health and safety regulations applicable to the workplace.*

In compliance with this article, screening for alcohol and narcotics consumption is regularly carried out on both workers directly employed by the nuclear facilities and subcontractors.

This article is the main regulatory development in the legislative framework for the qualification of personnel. The remaining legislation has not changed since the publication of the previous National Report. In each nuclear facility there is a Chief Operating Officer or technical officer who supervises all employment and operational activities, with the capability to suspend operation of the facility (NEA Article 37). Certain positions, set out in the RINR and identified as Head of the Radiological Protection Service, Supervisor and Operator of nuclear or radioactive facilities, also require the possession of specific licences. Each of these licences is personal and entitles the bearer to perform work at a specific facility. It is granted by the CSNCSN following a competence-based examination by a Court appointed by the CSNCSN[2] for assigning responsi-

[1] *By means of the Final Provision of Royal Decree 1308/2011 of 26 September on the physical protection of facilities, nuclear materials and radioactive sources.*

[2] *Documentary basis: CSN Safety Guide 1.1. Qualification for the granting and use of NPP operating personnel licences, and Safety Guide 7.2. Qualifications required to obtain recognition as an expert in protection against ionising radiations.*

bility for the corresponding service or technical unit or as Head of the Radiological Protection Service.

As explained in the previous Report, once the facilities enter into operation, the CSN performs regular inspections focused mainly on checking the academic background, experience and training required for each professional position, the basic training in radiological protection of all operators and the scope of retraining programmes, verifying that they cover changes in regulations, design modifications and relevant operating experience. Licensees are required to submit an annual report to the CSN summarising their personnel's main initial and ongoing training activities relating to nuclear safety or radiological protection.

Two CSN safety instructions dating from 2007 apply specifically to nuclear power plants: IS-11, on licenses for operating personnel of nuclear power plants and IS-12, defining the qualification and training requirements of non-licensed staff.

Internal organisation of personnel

As part of the application for the operating permit, which is granted in accordance with the procedure set out in the RINR, the facility's Operating Regulations detail the licensee's organisational structure, including the functions and responsibilities associated with all positions relating to nuclear safety and radiological protection. Any modifications to this document must be approved by the MINETUR Directorate General for Energy Policy and Mines, following a mandatory report by the CSN.

This section on organisational structure must also define the basic initial and on-going training programmes for licensed and non-licensed personnel, setting out the technical competence required for each specific task, along with the relevant re-training programmes. Likewise, the Site Emergency Plan sets out the responsibilities and human resources required to deal with emergency situations.

Since changes to the Operating Regulation of a facility are subject to a formal process of approval, this facilitates the CSN's monitoring and control of any change in the organisation and in the management of the facility that might negatively impact on its safety.

Human resources available at ENRESA

The national framework defines ENRESA as the corporation responsible for the management of radioactive waste and spent nuclear fuel, and the dismantling and decommissioning of nuclear facilities (Royal Decree 102/2014, Article 9). By virtue of this legislation, ENRESA has the status of licence holder for its facilities for the management of spent fuel and radioactive waste and acts as licensee for the other activities that it carries out which are similarly determined. ENRESA is the operator responsible for the El Cabril facilities, the dismantling of the Vandellós I and José Cabrera nuclear power plants, as well as the CTS when it becomes operational.

As of 31 December 2013, ENRESA has a staff of 335, of which 187 are employed at the Madrid head office, 126 at the El Cabril facilities, 7 at the Vandellós I nuclear power plant dismantling and decommissioning project, 12 at the José Cabrera nuclear power plant dismantling project, and 3 at Villar de Cañas, working on the CTS project (these figures will vary in line with the progress of the project).

Royal Decree 102/2014 confers on ENRESA the task of setting up training schemes and research and development plans within the framework of the State Plan for Scientific and Technical Research and Innovation, which cover the requirements of the GRWP and enable the acquisition, maintenance and further development of necessary knowledge and skills.

22.2 Availability of financial resources

The Waste Directive introduces into European legislation the obligation *'that adequate financial resources be available when needed for the implementation of national programmes for the management of spent fuel and radioactive waste, taking due account of the responsibility of spent fuel and radioactive waste generators'*.

Spain has had a Fund for the financing of activities included in the GRWP since ENRESA was established in 1984. This covers the costs relating to the management of radioactive waste and spent fuel, the dismantling of nuclear facilities, overheads and R&D projects.

The Fund for the financing of activities included in the GRWP is currently regulated by Additional Provision 6 of Law 54/1997, the Electricity Industry Act of 27 November, made effective by Law 24/2013 of 26 December and Royal Decree 102/2014 of 21 February on the safe and responsible management of spent nuclear fuel and radioactive waste, replacing and repealing Royal Decree 1349/2003 of 31 October on the regulation of Spanish radioactive waste management agency ENRESA's activities and funding.

During the period covered by this report there have been no significant developments in the financing system, which is summarised in Annex F of this Report.

Nevertheless, Royal Decree 102/2014 amends the current RINR, setting out, in the case of radioactive facilities in the nuclear fuel cycle whose dismantling and decommissioning or closure is not covered by the Fund, the obligation prior to their startup to submit a financial guarantee against future dismantling and management of the resulting radioactive waste.

This guarantee must be made prior to the granting of the operating permit and must be provisioned in such a way as to cover the costs and contingencies that might arise from the dismantling and decommissioning or closure of the facility, including in the event of insolvency, shutdown or any other contingency. The MINETUR Directorate General for Energy Policy and Mines can authorise the updating of this guarantee in the event of circumstances arising in or modifications to the facility which might have a significant impact on its dismantling and decommissioning or closure, or in accordance with work 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.

23.1 Quality Assurance Programme for the Management of Radioactive Waste and Spent Fuel

Article 7 of new Directive 2011/70/Euratom sets out that licence holders are required to *'establish and implement integrated management systems, including quality assurance, which give due priority for overall management of spent fuel and radioactive waste to safety and are regularly verified by the competent regulatory authority'*. This requirement is reproduced in Article 4.2 of Royal Decree 102/2014, transposing this Directive.

The concept of 'integrated management systems' is broader than 'quality assurance' in the strict sense, and is defined by the IAEA as 'a single coherent management system in which all the components of an organization are integrated to enable the organization's objectives to be achieved. Personnel, equipment and organizational culture, as well as the documented policies and processes, form parts of the management system'.

In Spain, all activities relating to the management of spent fuel and radioactive waste are subject to a quality assurance programme (QAP). The licence holder of the authorisation for the regulated facility or activity is responsible for establishing and implementing the QAP. QAPs must comply with standard UNE 73-401 'Quality Assurance at Nuclear Facilities', the requirements of which are equivalent to those of Appendix B of the US NRC 10 CFR 50 and those of the IAEA 50-C/SG-Q Code and Safety Guides on quality assurance at nuclear power plants and other nuclear facilities. Also considered acceptable is the application of basic regulations from a project's country of origin or from the codes and safety guides issued by the IAEA which the CSN deems relevant. The CSN has issued several safety guides to facilitate the implementation of QAPs.

The management of spent fuel and radioactive waste, and the design, construction and operation of on-site Individual Temporary Storage (ITS) facilities for spent fuel at nuclear power plants are included within the scope of the quality assurance programmes for these installations, which must fulfil the requirements of the UNE 73-401 standard.

For the design and manufacturing of storage and transport casks for spent fuel, quality assurance programmes meeting the requirements of standard UNE 73-401 and the quality assurance standards of the design's country of origin are applied.

In November 2008, the Nuclear Safety Council Instruction IS-19 was issued. This instruction, with which compliance was required as of 1 January 2010, originated from IAEA Safety Requirements No. GS-R-3 'The Management System for Facilities and Activities'. The regulatory body established that the quality system should also meet the requirements of the UNE 73-401:1995 standard 'Quality Assurance at Nuclear Facilities' and supplemented it with requirements relating to independent external assessments, self-assessment and corrective actions programmes. This instruction is applicable to all Nuclear Facilities throughout the entirety of their life cycle, i.e. from site selection to dismantling and decommissioning. The main development is the obligation to integrate requirements relating to nuclear and radiological safety, occupational risk prevention, the environment, physical protection, quality and economic aspects, with the aim of ensuring the protection of individuals and the environment.

Quality assurance at ENRESA facilities

Between January 2011 and the end of 2013, ENRESA focused its quality assurance activities along two lines: the implementation of the various developments required by Safety Instruction IS-19, and quality assurance activities on the design and construction project for the Centralised Temporary Storage (CTS) facility for spent fuel and high level waste at Villar de Cañas.

With respect to the various developments of IS-19, activity has focused on consolidating compliance with the requirements set out in the integrated management manual in the two facilities where they are currently applicable: the El Cabril disposal facility and the Plan for the Dismantling of the José Cabrera nuclear power plant.

Likewise within the scope of IS-19, the self-assessment process within the various services has been implemented, with the aim of identifying the degree of fulfilment of expectations for each of the activities carried out. This process, which is supplementary to the independent internal assessments, audits and quality assurance inspections which have always been carried out, provides important information resulting from internal reflection by those who undertake this task and a greater degree of commitment regarding the activities that they carry out.

The final phase of this improvement cycle has been reinforced by means of the implementation of an Integral Improvement System (IIS), which enables participation from all personnel in the identification and resolution of non-conformities, and determining preventative, corrective and improvement actions. Since its implementation in April 2010, over 1,000 actions have been undertaken to correct defects and improve processes and activities, establishing the IIS as the improvement mechanism for the integrated management system.

One significant development from the perspective of IS-19 is the process of assessment of safety culture. A multidisciplinary team was formed for this purpose and underwent a period of training. With the assistance of companies specialising in this area, the team has carried out various initiatives aimed at improving organisational culture through promoting constructiveness, thus stimulating greater awareness of safety culture.

With respect to the design and construction project for the Temporary Storage facility (CTS) for spent fuel and high level waste at Villar de Cañas, a quality assurance programme was developed which has been implemented since the start of activities, covering both site characterisation and the design and licensing of the facility. The programme refers to the UNE 73401:1995 standard for this phase of the project.

Likewise, the requirements of CSN Safety Instruction IS-29, published in October 2010, have been put into practice. This instruction sets the basic safety criteria and requirements that must be fulfilled in the design, manufacturing, construction, testing, operation and safety analysis of nuclear facilities for the storage of spent fuel and high level waste.

The application of this programme has been extended to include the engineering companies involved in the design of the CTS, with particular emphasis on the implementation of the Spanish UNE 73402:1995 standard.

The licensing phase includes a review of the quality assurance programme that will be used in the procurement, construction and pre-nuclear testing phases of the CTS.

It should also be pointed out that IS-19 has been implemented in this project, through which progress is being made on instilling effective safety culture. It also applies to the production of an integrated management manual and the implementation of assessment mechanisms, such as audits and self-assessment, the use of the IIS, and improvement management for all companies involved in the design.

23.2 Inspection and assessment system for quality assurance programmes and management systems

There have been no changes to the assessment and inspection system for the quality assurance programmes applicable to the management of spent fuel and radioactive waste described in previous reports.

During the period corresponding to the Fifth National Report, assessment activities have been ongoing with respect to the quality schemes for the design and construction of the Individual Temporary Storage (ITS) facilities for the Ascó and Sta. María de Garoña nuclear power plants and for the design and manufacturing of the storage and transport casks for spent fuel. Assessment activities have also been carried out on various applications for changes to the quality assurance programme for the dismantling of the José Cabrera nuclear power plant facilities, and to the quality assurance programme for the El Cabril centralised disposal facility for low and intermediate level solid waste.

During this period notable assessment activities carried out by the CSN have included those for the licensing of ENUN 32P casks (with capacity for 32 assemblies from PWR plants) and

ENUN 52B casks (with capacity for 52 assemblies from BWR plants), designed and manufactured by ENSA (*Equipos Nucleares*). Amongst the ongoing assessments are those for the quality assurance programme for the design, manufacture and acceptance tests for these casks. Documents and regulations applicable to the Quality Assurance Programme are as follows:

- ✓ IS-19: requirements of the nuclear facilities management system.
- ✓ IS-20: safety requirements relating to spent fuel storage casks.
- ✓ IS-24: regulating the filing and periods of retention of the documents and records of nuclear facilities.
- ✓ CSN Safety Guide 10.1: Basic Guide on Quality Assurance for nuclear facilities.
- ✓ Quality Standard UNE 73-401: Quality Assurance in Nuclear Facilities.
- ✓ Quality Standard UNE 73 402: Quality Assurance in the Design of Nuclear Facilities.
- ✓ US NRC 10 CFR 50 App. B: Quality Assurance Criteria for Nuclear Power Plants and Fuel Reprocessing Plants.
- ✓ US NRC 10 CFR 21: Reporting of Defects and Noncompliance. Applicable reference regulation. Notification to the US NRC is excluded, as indicated in Section 21.1.
- ✓ US NRC 10 CFR 71: Packaging and Transportation of Radioactive Material.
- ✓ US NRC 10 CFR 72: Licensing Requirements for the Independent Storage of Spent Nuclear Fuel and High Level Radioactive Waste.
- ✓ US NRC Regulatory Guide 7.10: Establishing Quality Assurance Programs for Packaging Used in the Transport of Radioactive Material.
- ✓ CSN Safety Guide 6.4: Documentation required when applying for authorisation for the transport of radioactive material: approval of packages and authorisation for shipments.
- ✓ ADR, applicable edition: European Agreement concerning the International Carriage of Dangerous Goods by Road.
- ✓ IAEA TS-R-1: Regulations for the Safe Transport of Radioactive Material.
- ✓ ANSI ASME NQA-1 1994 Edition: Quality Assurance Requirements for Nuclear Facility Applications.
- ✓ NUREG/CR-6407: Classification of Transportation Packaging and Dry Spent Fuel Storage
- ✓ System Components According to Importance to Safety.

As regards inspection activities during this period, the scheduled biennial inspections of implementation of the quality assurance programme at the El Cabril Centralised Disposal facility for low and intermediate level solid waste, and the implementation of the quality assurance programme for the dismantling of José Cabrera plant have been carried out. These inspections focus mainly on the following areas:

- ✓ Activities in the area of quality assurance: Inspections, audits, document reviews.
- ✓ Sampling on compliance with QAPs in facility services: Provision of equipment and services, maintenance, conditioning and storage, laboratories etc.
- ✓ Corrective Action Programme (CAP). Trend analysis, verification of action effectiveness, QAP indicators. Assessment of QAP effectiveness.
- ✓ Visits to areas of the facilities.

Regarding the design and manufacture of irradiated fuel casks, specific inspections have been carried out at the ENSA factory in Santander. These inspections focus mainly on the following areas:

- ✓ Organisational aspects and manufacturing scheme. Monitoring by the licensee.
- ✓ Checks on design monitoring activities, training specific to the project, and control of project documentation (design and manufacturing).
- ✓ Monitoring of suppliers and subcontractors. Audits and inspections of suppliers.
- ✓ Receipt of contracted materials and components.
- ✓ Manufacturing processes. Points of Inspection schemes.
- ✓ Monitoring of nonconformities and corrective actions.
- ✓ Cask manufacturing records.

With reference to the transport of radioactive material, one or two annual inspections of quality assurance programmes for transport companies for these materials are being carried out.

ARTICLE 24
OPERATIONAL RADIOLOGICAL PROTECTION

Article 24. Operational Radiological 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; and*
   - *(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 factors 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 of Spanish law that refer to radiological protection are included fundamentally in Law 15/1980 of 22 April, creating the CSN, and in the Regulation on the Protection of Health against Ionising Radiations (RPHIR), approved by Royal Decree 783/2001 of 6 July.

The law creating the CSN assigns to this organisation the following duties: surveillance and monitoring of on-site and off-site radioactivity levels for Spanish nuclear and fuel cycle facilities, and of their specific or cumulative impacts on the areas in which they are located; control of doses received by operating personnel; and informing and advising the Government on commitments with other countries or international organisations in relation to nuclear safety and radiological protection.

The basic standards for the radiological protection of exposed workers and members of the public against the risks arising from exposure to ionising radiations are established in Royal Decree 783/2001, approving the RPHIR.

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

The basic standards for the radiological protection of exposed workers and members of the public against the risks arising from exposure to ionising radiations are also applicable at facilities where spent fuel and radioactive waste are stored.

As an additional development to the provisions of the Regulation mentioned above, the Nuclear Safety Council has published various provisions involving mandatory compliance (Instructions), advising the licensees of nuclear power plants on the procedures to be adhered to in order to comply with certain of these provisions. For further details, see the Reports for previous years.

24.1 Protection of workers

24.1.1 Measures adopted to ensure that exposure to ionising radiations is kept as low as is reasonably achievable

The basic principles of justification, optimisation and limitation of individual doses are incorporated into Spanish legislation in the Regulation on the Protection of Health against Ionising Radiations, mentioned above.

The principle of optimisation, which is regarded as hierarchically superior to the other two principles, constitutes the fundamental basis of the current doctrine of radiological protection, and is defined in the following terms: *'Individual doses, the number of persons exposed and the probability of there being potential exposures should be kept as low as reasonably achievable, economic and social factors being taken into account'.*

The implementation of this principle requires special attention to all radiological protection measures aimed at preventing exposure to radiation. These are fundamentally based on the following:

- ✓ Assessment (prior to implementation) of the radiological risk associated with every activity involving the use of ionising radiation.
- ✓ The radiological classification of the workers involved, based on the radiological risk inherent in the work to be undertaken.
- ✓ The radiological classification of workplaces, based on foreseeable levels of radiation and contamination.

- ✓ The application of standards and control measures adapted to the different categories of exposed workers and the various workplaces.

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

24.1.2 Measures adopted to ensure that no worker 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 RPHIR establishes the following dose limits for exposed workers in Spanish nuclear and fuel cycle facilities:

- ✓ Effective dose limit: 100 mSv in five consecutive calendar years, subject to a maximum effective dose of 50 mSv in any one calendar year.
- ✓ Dose limit to the skin (averaged over 1 cm^2): 500 mSv per calendar year.
- ✓ Dose limit to the lens of the eye: 150 mSv per calendar year.
- ✓ Dose limit to hands, forearms, skin and ankles: 500 mSv per calendar year.

In most cases, the control of radiation doses received by exposed workers is accomplished through individual monitoring by passive personal dosimeters. There are cases, however, in which the radiological risk is sufficiently low for radiological monitoring of the workplace to suffice.

In Spain the dosimetric monitoring of workers exposed to ionising radiations is governed by the Regulation mentioned above, which sets out that individual dosimetry is to be undertaken by Personnel Dosimetry Services expressly authorised by the CSN.

The regulatory provisions set out in the RPHIR determine that a dosimetric history should be maintained for every exposed worker, recording all doses received throughout the course of their working life. These provisions assign to the licensee the responsibility for archiving these histories until the worker reaches the age of 65 years and never for less than 30 years from the date that the employee ceases work.

In 1985, the CSN agreed to implement a National Dosimetry Bank (NDB) in Spain to centralise the dosimetric histories of all exposed workers from the country's nuclear and fuel cycle facilities.

The NDB is managed by the CSN and at the end of dosimetric record keeping for 2013, there were approximately 20,013,827 dosimetry measurements recorded in the NDB, corresponding to some 326,175 workers and around 65,905 facilities. Each of these measurements included information on the type of facility and the work performed by the worker.

The number of individuals exposed to ionising radiation under dosimetric monitoring in Spain in 2013 amounted to 105,150.

Personal dosimetry

With regard to the dosimetry results corresponding to 2013 for the entire fleet of nuclear power plants, it should be pointed out that there were a total of 9,643 occupationally exposed and dosimetrically monitored workers in this field. The dosimetry readings amounted to a collective dose of 4,616.96 person-mSv, with the overall average individual dose for this group being 1.36

mSv/year, and calculation of this parameter taking only workers with significant doses[1] into account. This data is broken down between staff and contracted workers in the following table:

Table 7: Dosimetry results for 2013 for the entire fleet of nuclear power plants.

	OVERALL	STAFF	CONTRACTED
No. of exposed workers	9,643	2,197	7,506
Collective dose (person-mSv)	4,616.96	429.87	4,187.09
Average individual dose (mSv/year)	1.36	0.88	1.43

In 2013 there were 536 exposed workers carrying out activities at the Juzbado fuel assembly manufacturing facility. The dosimetry readings amounted to a collective dose of 81.67 person-mSv. If only workers with significant doses are taken into account, the average individual dose for this group amounts to 0.63 mSv/year.

In 2013 there were 202 exposed workers carrying out activities at the El Cabril radioactive waste disposal facility. The dosimetry readings amounted to a collective dose of 5.08 person-mSv. If only workers with significant doses are taken into account, the average individual dose for this group amounts to 0.46 mSv/year.

24.2 Protection of the public

The RPHIR expressly requires the application of the ALARA principle to the radiological protection of members of the public. This principle is applied to all licensing phases for Spanish nuclear facilities, and is set out in the official operating documentation of each facility.

As regards dose constraint, the RPHIR establishes the following dose limits for members of the public:

- ✓ Effective dose limit of 1 mSv per calendar year. In special circumstances, however, a higher effective dose value may be authorised in a single calendar year, provided the average over five consecutive calendar years does not exceed the above value.
- ✓ Without prejudice to the above, a dose equivalent limit of 15 mSv is established per calendar year for the lens of the eye, and of 50 mSv for the skin.

24.2.1 Release limits for nuclear facilities

The operating permits of all Spanish nuclear facilities set out, as part of the Technical Operating Specifications (TOS), the system for the limitation, surveillance and control of radioactive effluents.

For nuclear power plants, the radioactive effluent limitation, surveillance and control system is set out in detail in the Dose Calculation Manual (DCM), whilst for the El Cabril waste disposal facility, this information is included in the Specifications document.

[1] *Significant doses are those exceeding the recording level (0.1 mSv/month).*

An effective dose limit of 0.1 mSv/year for each on-site unit is applied to nuclear power plants, both during operation and during shutdown and the dismantling phase. This value, which corresponds to periods of twelve consecutive months, is applicable to the combined amount of liquid and gaseous radioactive effluents released.

At the José Cabrera nuclear power plant, therefore, whose dismantling was authorised on 1 February 2010, this limit still applies.

Of note is the fact that at Spanish nuclear power plants the water in the irradiated fuel storage pools does not constitute make-up water for the liquid radioactive effluent treatment systems.

At the El Cabril disposal facility, a zero discharge criterion is applied for liquid radioactive effluents. Only gaseous radioactive effluents are discharged into the environment, for which the release limit is an effective dose of 0.01 mSv during twelve consecutive months.

24.2.2 Verification of compliance with release limits

Every month, the licensees of Spanish nuclear facilities are required to estimate the critical individual dose for the public, accumulated over twelve consecutive months on the basis of the results of the radioactive effluent sampling and analysis programmes. This calculation is performed in accordance with the ODCM methodology and on the basis of highly conservative criteria, with the aim of verifying compliance with the established limits.

Since 2008, activity measurements obtained by applying these sampling and analysis programmes have been carried out in accordance with the criteria of Recommendation 2004/2/Euratom, on standardised information on radioactive airborne and liquid discharges into the environment from nuclear power reactors and reprocessing plants in normal operation.

The results of the sampling and analysis programmes, as well as the dose estimates and other relevant data on effluents are submitted monthly to the CSN.

In addition, and in accordance with Article 53 of the RPHIR, the licensees carry out an annual dose estimate for the reference group, taking more realistic criteria into account. Reference groups are equivalent to critical groups, as described in ICRP Publication 60.

In accordance with the TOS, the licensees carry out environmental radiological monitoring programmes (ERMPs) in areas affected by nuclear facilities. The results of the ERMPs, which are submitted annually to the CSN, enable understanding of the true impact of environmental releases.

24.2.3 Control of releases

In accordance with regulatory requirements, Spanish nuclear facilities have liquid and gaseous effluent treatment systems that enable collection, storage and processing of the different types of liquid and gaseous radioactive waste generated during the normal operation of facilities and during anticipated operating incidents.

The release of radioactive effluents into the environment must comply with the established limits, aiming, in addition, that it be as low as possible, taking socio-economic factors and the best available techniques into consideration (IS-26).

In accordance with the RINR, licensees are required to implement an ongoing improvement programme in line with the evolution of the applicable regulations, technological progress and operating experience. Specifically, Article 8.3 of this regulation establishes that the licensees must continuously oversee the improvement of the radiological protection status of their facility. To this end, they must analyse the best existing techniques and practices, in accordance with the

requirements established by the Nuclear Safety Council, and implement those that are most suitable in the opinion of the Council.

Likewise, licensees of nuclear power plants are required to carry out a periodic safety review including the following, on the basis of a ten-year period:

- ✓ analysis of the overall performance of the facility;
- ✓ demonstration that the lessons learned from the analysis of operating experience have been correctly implemented; and
- ✓ evaluation of whether the relevant changes introduced in new generation plants are applicable to the facility.

Consequently, the Spanish regulatory system governing the control of radioactive effluents constitutes an adequate framework for the efficient application of a clearly established policy that requires the implementation of applicable technological developments, that complies with the requirements and recommendations of the competent international organisations and that incorporates the necessary measures to ensure the limitation of releases and the minimisation of impact on the public and the environment.

Releases from Spanish nuclear power plants and from the El Cabril disposal facility in 2011, 2012 and 2013 are summarised in Tables 8 and 9, respectively.

In the case of the José Cabrera plant, the effluents released into the environment have been generated as a result of the ongoing tasks of the dismantling phase.

These releases present a minimum risk to members of the public and for the overall population, as can be seen from the doses due to releases for the three years under consideration, which have not exceeded 4.0% in the case of Spanish nuclear power plants and 8.3% in the case of the El Cabril disposal facility, with respect to the authorised release limit in both cases.

Table 8: Activity of radioactive effluents from Spanish NPPs (Bq).

	PWR Plants[1]						BWR Plants[1]	
	José Cabrera[2] NPP	Almaraz I y II NPP	Ascó I NPP	Ascó II NPP	Vandellós II NPP	Trillo NPP	Sta. Mª Garoña NPP	Cofrentes NPP
Liquid Effluents								
2011								
Total except Tritium and Gases	- -	$5.67\ 10^{9}$	$8.10\ 10^{9}$	$5.58\ 10^{9}$	$4.86\ 10^{9}$	$2.59\ 10^{8}$	$3.90\ 10^{8}$	$1.67\ 10^{8}$
Tritium	- -	$6.45\ 10^{13}$	$1.36\ 10^{13}$	$3.03\ 10^{13}$	$2.04\ 10^{13}$	$1.58\ 10^{13}$	$6.39\ 10^{11}$	$2.35\ 10^{11}$
Dissolved Gases	- -	$5.81\ 10^{7}$	$2.10\ 10^{8}$	$4.45\ 10^{7}$	$2.69\ 10^{8}$	(3)	ND	$6.89\ 10^{7}$
2012								
Total except Tritium and Gases	$2.92\ 10^{7}$	$7.57\ 10^{9}$	$7.19\ 10^{9}$	$8.13\ 10^{9}$	$7.55\ 10^{9}$	$2.46\ 10^{8}$	$1.22\ 10^{8}$	$6.46\ 10^{7}$

Tritium	2.35 10^{10}	5.83 10^{13}	3.97 10^{13}	2.72 10^{13}	3.91 10^{13}	1.53 10^{13}	4.22 10^{11}	3.29 10^{11}
Dissolved Gases	- -	7.43 10^{9}	5.58 10^{9}	4.68 10^{7}	1.82 10^{8}	(3)	9.90 10^{5}	1.22 10^{6}
				2013				
Total except Tritium and Gases	4.68 10^{7}	5.67 10^{9}	3.75 10^{9}	7.85 10^{9}	7.27 10^{9}	2.59 10^{8}	5.99 10^{7}	2.65 10^{8}
Tritium	1.55 10^{10}	4.45 10^{13}	8.06 10^{12}	7.77 10^{12}	2.48 10^{13}	1.82 10^{13}	4.21 10^{11}	5.19 10^{11}
Dissolved Gases	- -	7.09 10^{7}	2.36 10^{8}	3.50 10^{7}	8.47 10^{7}	(3)	ND	8.67 10^{7}
				Gaseous Effluents				
				2011				
Noble Gases	- -	1.27 10^{13}	3.24 10^{13}	2.71 10^{12}	2.35 10^{12}	1.24 10^{12}	2.85 10^{12}	1.76 10^{13}
Halogens	- -	ND	1.57 10^{6}	ND	2.91 10^{7}	1.07 10^{7}	1.17 10^{9}	1.08 10^{10}
Particles	6.33 10^{5}	5.87 10^{5}	2.54 10^{6}	2.45 10^{6}	1.43 10^{8}	1.60 10^{6}	3.02 10^{7}	1.15 10^{8}
Tritium	9.94 10^{8}	4.93 10^{12}	4.99 10^{11}	8.69 10^{11}	2.68 10^{11}	5.86 10^{11}	1.24 10^{12}	1.05 10^{12}
Carbon-14	- -	5.41 10^{11}	3.01 10^{11}	4.65 10^{11}	5.91 10^{10}	3.19 10^{10}	2.20 10^{11}	4.21 10^{11}
				2012				
Noble Gases	- -	8.35 10^{12}	5.83 10^{13}	2.60 10^{12}	6.30 10^{12}	3.19 10^{11}	1.64 10^{12}	7.58 10^{12}
Halogens	- -	4.18 10^{6}	4.92 10^{6}	ND	1.92 10^{8}	ND	5.43 10^{8}	2.49 10^{8}
Particles	5.02 10^{5}	1.04 10^{6}	3.91 10^{6}	6.25 10^{6}	5.01 10^{7}	1.02 10^{6}	1.15 10^{7}	1.06 10^{7}
Tritium	4.27 10^{9}	3.05 10^{12}	6.80 10^{11}	4.75 10^{11}	2.80 10^{11}	4.86 10^{11}	1.84 10^{12}	4.89 10^{11}
Carbon-14	- -	1.50 10^{11}	2.28 10^{11}	4.61 10^{11}	4.63 10^{11}	2.81 10^{10}	2.05 10^{11}	2.29 10^{11}
				2013				
Noble Gases	- -	1.45 10^{13}	3.36 10^{13}	1.35 10^{11}	4.80 10^{10}	2.50 10^{11}	ND	6.87 10^{12}
Halogens	- -	ND	ND	ND	5.27 10^{5}	ND	3.48 10^{5}	1.08 10^{9}
Particles	1.65 10^{6}	1.13 10^{6}	5.43 10^{6}	8.53 10^{6}	1.59 10^{8}	ND	1.25 10^{6}	1.89 10^{7}
Tritium	4.04 10^{9}	2.68 10^{12}	7.85 10^{11}	2.69 10^{11}	4.82 10^{11}	5.93 10^{11}	5.23 10^{11}	1.01 10^{12}
Carbon-14	- -	2.89 10^{11}	1.64 10^{11}	1.88 10^{11}	2.03 10^{11}	6.75 10^{10}	4.64 10^{9}	5.23 10^{11}

(1)ND = Not Detected
(2)Plant in the dismantling phase since 1 February 2010
(3)No dissolved gases are entrained in the liquid releases since they are eliminated during their treatment process.

Table 9: Activity of radioactive effluents from El Cabril (Bq).

GASEOUS EFFLUENTS	TOTAL ALPHA	TOTAL BETA	GAMMA (1)	TRITIUM	CARBON-14
2011	$6.87\ 10^{3}$	$1.15\ 10^{5}$	ND	$1.30\ 10^{10}$	$3.09\ 10^{8}$
2012	$2.87\ 10^{4}$	$1.03\ 10^{5}$	$2.65\ 10^{4}$	$1.16\ 10^{9}$	$1.53\ 10^{7}$
2013	$1.00\ 10^{4}$	$5.74\ 10^{4}$	ND	$5.96\ 10^{8}$	$9.52\ 10^{6}$

(1) *ND = Not Detected*

24.2.4 Unplanned or uncontrolled releases

In order to prevent unplanned and uncontrolled releases of radioactive materials into the environment, Spanish nuclear facilities are equipped with the following:

- ✓ Monitoring instrumentation for the detection of these discharges.
- ✓ Isolating devices for releases which exceed certain predetermined values.
- ✓ Alarm activation in the event of the detection of abnormal conditions.
- ✓ Administrative controls.

If, in spite of these measures, an uncontrolled or unplanned release occurs, the licensees of nuclear facilities must implement the necessary measures to halt or control this release, where possible, and to minimise its off-site impact. Likewise, they are required to identify the cause or causes for the release and define the actions to be implemented to avoid recurrence. All these aspects must be reported to the CSN for analysis and approval.

The ERMPs carried out by the licensees of nuclear facilities enable the identification of any increase in environmental activity as a result of these releases and verification of the efficiency of the measures taken to mitigate their effects.

Article 25
Emergency preparedness

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.*

25.1 Assignment of responsibilities in emergency situations

The Basic Nuclear Emergency Plan (PLABEN) sets out planning and preparation for emergency situations that might arise as a result of accidents in operational nuclear power plants or those in shutdown storing spent fuel in their pools.

The Basic Directive on Civil Defence Planning in response to Radiological Risk (BDRR) sets out the minimum criteria to be followed by the various Public Administrations and, where relevant, the licensees of regulated nuclear and radioactive facilities and the licensees of other installations or activities where radiological risk might occur in exceptional cases. Included amongst these would be facilities for the permanent disposal of low and intermediate level radioactive waste (El Cabril) and temporary storage facilities for high level radioactive waste. This second category includes facilities currently under the regulation of the PLABEN: the individual temporary storage facilities (ITS), which will, at a future time yet to be determined, be regulated under the Basic Directive and the centralised temporary storage (CTS) facility at Villar de Cañas, currently in the authorisation phase for siting and construction.

All waste management facilities have On-site Emergency Plans. Off-site Emergency Plans are drawn up in line with the regulations mentioned above. The main competent authorities, relevant public bodies and international organisations involved in emergencies have been described in previous reports.

25.2 Legislative and regulatory framework governing emergency situations

Previous reports outline the legislative framework, to which the following changes have been made:

The intervention protocol for the Military Emergency Unit (MEU) was approved by means of Royal Decree 1097/2011 of 22 July, setting out the circumstances under which the intervention of the MEU may be ordered. This protocol sets out that the Ministry of Defence, on behalf of the President of the Government, shall order the intervention of the MEU. The MEU's operations will be circumscribed by the requirements of the current legislation on civil defence and particularly to those governing the assignment of responsibilities between the State and the Autonomous Communities. The decision to terminate the operation shall be taken by the Ministry of Defence by proposal of the Ministry of the Interior and subsequent to comment by the authorities requesting intervention. The initiation and termination of these operations shall be notified to the Department of National Security of the Spanish Government.

✓ **Regulation on Nuclear and Radioactive Facilities (RINR)**

Royal Decree 1836/1999 of the Ministry of Industry and Energy, approving this Regulation, has been amended by Royal Decree 35/2008 of 18 January and Royal Decree 102/2014 of 21 February. The Regulation stipulates that in order to obtain the mandatory authorisations for the use or operation of a nuclear or radioactive facility, the applicant must draw up and submit an Emergency Plan, which will be approved on granting these authorisations.

Currently in Spain, there is no facility whose main purpose is the management of spent fuel. There is, however, a facility whose main purpose is the management of low and intermediate level radioactive waste, which according to Spanish regulations is categorised as a nuclear facility. Consequently, as with nuclear power plants, this facility is required to have an On-site Emergency Plan, which is currently approved by the Ministry of Industry, Energy and Tourism, subsequent to a CSN report which assesses this plan in the light of specific national and international regulations.

✓ **Royal Decree 102/2014 of 21 February on the safe and responsible management of spent nuclear fuel and radioactive waste**

Royal Decree 102/2014 of 21 February, on the safe and responsible management of spent nuclear fuel and radioactive waste, repeals Royal Decree 1349/2003 of 31 October on the regulation of Spanish radioactive waste management agency ENRESA's activities and funding and completes the transposition into Spanish legislation of the European Directive on spent fuel management. It sets out general principles applicable to the management of spent nuclear fuel, responsibilities associated with this management and the content of the General Radioactive Waste Plan, in addition to aspects relating to the financing of activities included in this Plan. Both the PLABEN and the BDRR assign to ENRESA the management of radioactive waste in the event of emergencies, under the coordination of the CSN.

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

✓ **On-site Response Level**

There have been no changes with respect to the previous report.

✓ **Off-Site Response Level**

With regard to the previous report and the content of this section, the CSN has approved the Special Plans in response to Radiological Risk for the Autonomous Communities, submitted by the regional governments of Catalonia, Valencia and the Basque Country.

✓ **CSN emergency preparedness and response**

The CSN makes an ongoing effort to keep its Emergency Response Organisation trained and up-to-date in order to address with surety and efficiency all functions assigned by law to the CSN in the event of an emergency, by means of updating and acquiring new material resources and the approval of contracts and protocols which make new resources available. Previous reports give a complete description of the CSN's Emergency Response Organisation (ERO).

25.4 Initial and ongoing training: drills and exercises

The CSN's Emergency Response Organsation (ERO) is constantly involved in the performance of drills and exercises which ensure its effectiveness in the event of an emergency. It carries out annual supervision of the initial and ongoing training of emergency response personnel in nuclear facilities and particularly with respect to management facilities for low and intermediate level waste.

The CSN monitors the performance of the annual emergency drills at all nuclear facilities through the activation and implementation of the ERO at the SALEM Emergency Room. At this time and in accordance with the agreements between the Military Emergency Unit (MEU) and the CSN, support emergency rooms (SALEM) have been set up in sub-offices of the MEU. These are equipped with replicas of all systems at the disposal of the CSN's Emergency Response Organisation, to enable the monitoring and assessment of nuclear and radiological emergencies in the event of the CSN's SALEM being unavailable.

The activities performed during these drills are carried out under conditions of maximum realism, implementing the procedures in place for the activation and intervention of ERO operating groups. Furthermore, these drills involve coordination practice between the CSN and the corresponding Provincial and National Authorities, with the aim of verifying the general efficiency of the existing procedures.

In addition, and in relation to the performance of drills, the CSN sends inspectors to facilities to check the effectiveness of On-site Emergency Plans and carry out on-site monitoring of the performance of drills. The facility can be required to implement any corrective actions that, where relevant, might arise as a result of this monitoring.

On 5-7 November 2013, the *Cáceres Urgent Response International Exercise* (CURIEX) was carried out in response to a hypothetical accident at the Almaraz nuclear power plant. This exercise corresponded to what is understood in the Basic Nuclear Emergency Plan (PLABEN) as a general drill for the Off-site Nuclear Emergency Plan for the Almaraz nuclear power plant (PENCA).

This exercise included all PENCA's associated resources, other CBRN support resources for the PENCA Radiological Group, under the CSN, originating from national organisations, activated via the Central Level Response and Support Plan (PENCRA).

Also in support of the PENCA Radiological Team, international CBRN resources were activated via PENCRA from Belgium, Italy, France, Portugal and Morocco. The exercise has demonstrated the training, efficiency and rapid incorporation of CBRN resources via the Monitoring and Information Centre (MIC) of the European Civil Protection Mechanism.

The detailed technical scenario for the urgent response phase, on 5 and 6 November, involved an accident that evolved to category IV of the On-site Emergency Plan in one of the units at the Almaraz nuclear power plant. This involved reaching Situation 3 of the Emergency Plan, and therefore entailed the recommendation, from the CSN's ERO, of countermeasures to mitigate the radiological consequences to the population within the area of Zone I (10 km radius of the plant) as set out for Situation 3 in the Emergency Plan: containment, radiological prophylaxis and evacuation of the population.

ENRESA had an active role in both the urgent response phase of the drill, in the management of the hypothetical radioactive waste generated, and during the desktop exercise on the third day of the start of recuperation phase tasks, in the debates on the effectiveness of decontamination techniques in urban and rural areas, and the resulting management of the radioactive waste generated in these processes.

25.5 International arrangements, including those with neighbouring countries where necessary

The Spanish State is a contracting party to international conventions on early notification and mutual assistance. It is subject to obligations on the exchange of information in the event of a nuclear accident or radiological emergency and has signed various agreements and bilateral cooperation protocols, at Government level and between regulators. Likewise, mainly through the CSN, Spain is actively involved in exercise and drill programmes, both bilaterally and multilaterally. Previous reports include additional information on these specific agreements.

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 Regulation on Nuclear and Radioactive Facilities (RINR), dismantling is the process whereby the licensee of a facility, having obtained the corresponding authorisation, undertakes the activities of decontamination, disassembly of equipment, demolition of structures and removal of materials in order to ultimately enable the complete or restricted release of the site. The dismantling process culminates with a declaration of decommissioning, which releases the licensee of the facility from their responsibility as operator and, in the case of restricted release of the site, defines the applicable limitations on usage and the party responsible for maintenance and surveillance of compliance.

Annex B to this report includes information on the licensing processes for dismantling.

26.1 Dismantling responsibilities and organisation

Dismantling and decommissioning of nuclear facilities in Spain constitutes an essential public service, assigned to the Spanish radioactive waste management agency ENRESA by virtue of Article 38a of Law 25/1964, the Nuclear Energy Act (NEA). ENRESA acts as licensee in operations related to the dismantling and decommissioning of nuclear facilities and, where appropriate, radioactive facilities.

In accordance with the RINR, when the operating permit for a nuclear facility expires, the initial responsibility for its decommissioning, prior to the granting of the corresponding authorisation, lies with the licensee of the facility, who is responsible for the designated pre-dismantling activities. Prior to the granting of the dismantling authorisation, the licensee of the operating permit must have conditioned the radioactive waste resulting from the operation of the facility, in accordance with the acceptance criteria of the storage installation to which it will be transferred. Secondly, the licensee of the facility must have unloaded the fuel from the reactor and the irradiated fuel storage pools or, failing the latter, have a spent fuel management plan approved by the MINETUR.

Once the licensee of the facility has concluded the pre-dismantling activities, as mentioned above, the facility must be temporarily transferred to ENRESA, to proceed with its dismantling. The obligations and requirements involved in this transfer of licence are specified and set out in detail in a contract between ENRESA and the nuclear facility owners, approved by the MINETUR.

ENRESA's organisation and responsibilities, as licensee of the facilities in the dismantling phase, are legally defined by the RINR.

26.2 Financing of dismantling

In general, there have been no changes to the financing of dismantling and decommissioning of nuclear facilities with respect to the information given in the previous National Report. Further details of the financing system are given in Annex F.

26.3 Radiological protection and emergencies during dismantling

As described in the previous National Report, nuclear facilities in the dismantling phase are considered as nuclear facilities until their declaration of decommissioning is granted and submitted to the RINR. This aspect is fully covered by the regulations indicated in the section concerning compliance with provisions in Article 24 on Operational radiological protection, and Article 25 on Emergency preparedness, of this convention.

26.4 Documentary archive for dismantling and decommissioning

The RINR sets out the obligation for licensees of nuclear facilities to adequately compile and preserve all relevant information from the operational phase. This Regulation also requires that during their operation, all authorised nuclear facilities have projections for dismantling and decommissioning of the facility, which include descriptions of the plans for the definitive management of the radioactive waste generated, the cost study, and the economic and financial forecasts for guaranteeing decommissioning (Article 20j).

The agreements on the transfer of facilities to be decommissioned to ENRESA contractually establish the mechanisms and procedures enabling it to access all archives concerning the operation of the facility. As a result, ENRESA may use any available information it considers to be relevant for the design and execution of the dismantling and decommissioning plan for the facility.

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Section G

Safety of Spent Fuel Management

Section G. Safety of Spent Fuel Management

This section covers the obligations under Articles 4 to 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.

The spent fuel generated at Spanish nuclear power plants is stored during the first stage in the pools of the operational reactors. In certain nuclear power plants, when the capacity of these pools is insufficient, the fuel is transferred to on-site dry storage facilities (ITS). Up to the date of this report, this has been the case for the Trillo, José Cabrera (in the dismantling phase) and Ascó nuclear power plants. These storage facilities use storage casks based on US technology: dual-purpose metallic casks which are approved for storage and transport in the case of the Trillo nuclear power plant, and concrete and metal casks for the José Cabrera and Ascó plants.

The Santa María de Garoña nuclear power plant ITS is currently in the licensing phase. More detailed information on the technology used can be found in the relevant section of Article 7.3 of this Report.

The spent fuel storage installations are nuclear facilities, or parts of nuclear facilities, and are governed by the general regulatory and legal framework applicable to this type of facility, set out in Annex A of this Report. This consists principally of Law 25/1964, the Nuclear Energy Act of 29 April (NEA), the Regulation on Nuclear and Radioactive Facilities[1] (RNRF), the Regulation on the Protection of Health against Ionising Radiations (RPHIR) and environmental legislation, in addition to the following CSN Safety Instructions (IS):

- ✓ Instruction IS-20 on safety requirements relating to spent fuel storage casks, published on 18 February 2009.
- ✓ Instruction IS-26 on basic nuclear safety requirements applicable to nuclear facilities, published on 8 July 2010.
- ✓ Instruction IS-29 on safety criteria at storage facilities for spent fuel and high level waste, 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 Directive 2009/71/Euratom on nuclear safety.

4.1 Measures to ensure the maintenance of subcritical conditions and heat removal

The maintenance of subcritical conditions and of adequate heat removal in facilities and systems for spent fuel storage are safety requirements that are incorporated through the implementation of technical and administrative or monitoring systems, subject to analysis, assessment and surveillance.

The measures adopted by the licensees in order to comply with these requirements are described in the Safety Analyses, official documents submitted along with the applications for authorisations during the different phases of the facility, and in the Technical Operating Specifications, which are also mandatory documents for the operation of nuclear facilities.

These measures take into account the criteria established in the technical standards of the IAEA, as well as the standards in force in the technology's country of origin (US NRC 10 CFR 50 in the case of pools and US NRC 10 CFR 72 in the case of dry storage systems and facilities). These criteria and requirements have been incorporated in the national regulations through the Nuclear Safety Council Instructions mentioned above, in particular IS-20 and IS-29.

4.1.1 Measures to ensure the maintenance of subcritical conditions

As stated in the previous report, the design criterion adopted for the maintenance of subcritical conditions at fuel storage facilities (both in pools and the dry storage casks used at the Trillo, José Cabrera, and Ascó ITS facilities and in the basic design of the CTS facility evaluated by the CSN) is that the neutron multiplication factor (K_{eff}), including all biases and uncertainties with a confidence level of 95%, should be lower than 0.95 under normal or abnormal operating conditions and accident conditions.

[1] *Approved by Royal Decree 1836/1999 of 3 December and amended by Royal Decree 35/2008 of 18 January, Royal Decree 1308/2011 of 26 September and Royal Decree 102/2014 of 21 February.*

The methods used to maintain subcritical conditions are as follows:

- ✓ In the pools associated with nuclear reactors, by the maintenance of a geometrically safe configuration, the use of neutron poisons, the limitation of initial enrichment and burnup credit. The application of these methods varies from one facility to the next, as specified below. At PWR plants, burnup credit was incorporated in the re-racking operation carried out to increase the capacity of the pools. These were divided into two regions: region II for the storage of fuel exceeding a specific burnup based on initial enrichment; and region I, where both fresh fuel and irradiated fuel not reaching the conditions for storage in region II may be stored. At BWR plants, the 5% subcriticality margin is maintained by the measures described in the previous paragraph.
- ✓ In the dry storage casks used at the on-site ITS facilities at the existing nuclear power plants, the methods used to maintain subcritical conditions are based on the inherent geometry of the rack housing the fuel, the use of neutron absorbent panels either incorporated into or attached to the rack and finally the administrative limits on the maximum enrichment of U-235. In the case of PWR fuel, the minimum concentration of boron dissolved in the water for loading and unloading the fuel in the casks or canisters is an additional guarantee.
- ✓ In the case of the planned CTS facility, measures to prevent criticality in the assessed generic design are based on maintaining a favourable geometry of the storage canisters and limiting the number of fuel assemblies per canister, the consideration of safety margins in the parameters determining criticality in accordance with the uncertainties in the data and analysis methods, and the implementation of monitoring and criticality alarms in areas where the fuel is handled or temporarily stored before being transferred to the storage tube.

4.1.2 Measures to ensure adequate heat removal

- ✓ In the plants' on-site fuel storage pools, the cooling system removes the generated heat without exceeding the established temperature limits and maintains a minimum level of water above the fuel assemblies which ensures adequate shielding in any situation. The re-racking undertaken in all the plant pools required the analysis and calculation of the residual heat and the re-evaluation of the existing cooling systems at the time of undertaking the re-racking.
- ✓ The storage casks for the ITS facilities at the Trillo, Ascó and José Cabrera plants are designed to release the heat generated by the fuel assemblies into the environment by means of passive convection, conduction and radiation mechanisms.
  - ➪ In the Trillo casks, heat removal is facilitated by the aluminium disks of the rack and the stainless steel and copper fins arranged radially around the neutron shielding wrapper.
  - ➪ In the case of the José Cabrera and Ascó plants, the casks are equipped with a metal and concrete structure ventilated by natural convection that allows for the cooling of the canister located within.
- ✓ The generic design for the CTS facility projects that ventilation will be accomplished by a system of cooling by natural air convection; the structures fulfilling a safety function will remain below the temperature limits in order to prevent degradation of the spent fuel cladding. For this purpose, each storage vault will be equipped with an independent cooling circuit based on natural air convection. Air from outside will enter via the air inlets and will be channelled to the lower plenum of the vault to circulate inside

the double sleeve surrounding the storage tubes. The hot air will then flow to the upper plenum of the vault prior to being released to the exterior via the stack. A metal plate located at an intermediate height inside the vault will ensure separation between the lower inlet plenum and the internal volume of the vault.

4.2 Measures to ensure that the generation of radioactive waste associated with spent fuel management is kept to the minimum practicable

The minimisation of waste generation is one of the principles incorporated in the legislation governing nuclear energy (Article 38 of the NEA). It is also a waste management principle set out in Directive 2011/70/Euratom (Article 4) and included in Royal Decree 102/2014 (Article 3 a) which transposes it into Spanish legislation.

As regards the wet storage systems for spent fuel, waste minimisation is geared towards the greatest possible reduction of the secondary waste produced in the purification of the water in nuclear power plant pools and the filters from the air ventilation and cleaning systems of the buildings in which the pools are located. The procedures used for this purpose are supervised by the CSN. Similarly, the design of dry storage facilities for spent fuel and the processes associated with fuel loading take into account waste minimisation criteria, established as a general requirement for nuclear facilities in the corresponding legislation.

4.3 Measures for taking into account the interdependencies among the different steps in spent fuel management

Consideration of the interdependencies between all stages of the management of radioactive waste and spent fuel is an element which has been part of the Spanish legal and regulatory framework for decades. After the adoption of Directive 2011/70/Euratom, this consideration has been reinforced, by being incorporated as a governing principle for national policies in accordance with Article 4.3b of the Directive. In line with this, Royal Decree 102/2014 also sets out the consideration of these interdependencies as one of the general principles in the implementation of regulations on radioactive waste and spent fuel (Article 3b).

A similar declaration can be found in CSN Instruction IS-26 of 16 June 2010, on basic nuclear safety requirements applicable to nuclear installations, with reference to radioactive waste management (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, a basic measure for the implementation of this principle is through the adoption of the **Plan for the Management of Radioactive Waste and Spent Fuel (PLAGERR)**, an official document for the operation of nuclear facilities, approved by the MINETUR, subsequent to a report from the CSN during the licensing process for a facility. CSN Safety Guide 9.03, dating from 2008, regulates the objectives, criteria and contents of these plans. Consequently, all fuel and waste management plans of operational nuclear power plants have been revised by the licensees for adaptation to the Safety Guide. These plans have been assessed and approved by the CSN.

A direct reflection of the consideration of interdependencies will be the adoption of acceptance criteria for the radioactive waste and spent fuel at the future CTS to be run by ENRESA, which are currently in development. Of particular interest in this area is the introduction of the following article in the new Royal Decree transposing the Directive:

> *Article 11. Technical and administrative specifications for acceptance.*
>
> 1. *The licensees of nuclear and radioactive facilities are obliged to endorse the technical and administrative specifications for acceptance of spent nuclear fuel and radioactive waste, with a view to their collection and subsequent management by ENRESA.*
> *(...)*
>
> 3. *These specifications set out the period of enforcement, which extends until the end of the facilities' lives, including dismantling and decommissioning or closure of nuclear facilities and, when applicable, radioactive facilities.*
>
> 4. *These specifications must have been approved by the Ministry of Industry, Energy and Tourism, subsequent to a Nuclear Safety Council report.*

Standard contracts for licensees of nuclear facilities in relation to spent fuel, as well as those for HLW and SW, take into account technical and administrative specifications for acceptance.

Finally, it should be pointed out that, among ENRESA's informational obligations to the CSN introduced by the new Royal Decree, information on interdependencies, competency interfaces and agreements with other facilities for the management of spent fuel and radioactive waste must be submitted during the first quarter of each year (Article 12.2 of Royal Decree 102/2014).

4.4 Measures for the protection of individuals, society and the environment

Provisions for the protection of people and the environment against risks deriving from nuclear and radioactive facilities are included in the current Spanish legal framework, as set out in Sections E and F of this Report. These provisions apply both to the spent fuel management facilities associated with nuclear power plants and independent spent fuel storage facilities.

The general measures adopted in relation to protection of workers, as well as those relating to the control and monitoring of effluents and the optimisation of radiological protection at nuclear power plants are set out in Article 24 of this Report. In the field of spent fuel management and specifically in that of storage facilities for spent fuel and high level waste, the basic protection criteria for workers are included in Article 38 of the NEA and the dosage criteria in IS-29, as has been described in previous national reports.

Radiological protection measures for individuals and society in the case of facilities for the management and storage of spent fuel are covered in the previous national report to the joint convention.

Environmental protection measures are regulated by Spanish legislation on environmental impact assessment, specifically in Law 21/2013 of 9 December on environmental assessment, which incorporates Directive 2001/42/CE 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.

According to this legislation, facilities for the storage, planned for more than 10 years, of spent fuel in a different site than the production site shall be subject to an environmental impact statement.

In accordance with this, the on-site Individual Temporary Storage facilities (ITS) at the José Cabrera and Ascó nuclear power plants were subject, pursuant to the current legislation, to Environmental Impact Assessment (EIA). Likewise, the licensing for the planned ITS at the Santa María de Garoña nuclear power plant and the centralised temporary storage facility (CTS) planned at Villar de Cañas (Cuenca) will also require corresponding EIAs.

With regard to the projected CTS facility, in October 2013, the CSN reported to the Directorate General for Environmental Quality and Assessment of the Ministry of Agriculture, Food and the Environment on the consultation carried out concerning the scope and degree of detail required for the Environmental Impact Study on the Centralised Temporary Storage (CTS) Project and the associated Technological Centre in the municipality of Villar de Cañas. This is based on its most significant impacts, as well as other potential operational choices, information and regulations that should be taken into account by ENRESA in the production of this study.

4.5 Measures for taking into account the biological, chemical and other hazards that may be associated with spent fuel management

The prevention of biological, chemical and non-radiological risks associated with the management of spent fuel is regulated by the legislation common to other industrial activities entailing such risks, constituted basically by the legislation on environmental impact assessment[1], which transposes the European Union Directives. The authorisation for spent fuel management facilities requires an environmental impact assessment taking such risks into account.

Protection against non-radiological risks to personnel operating such facilities is regulated by Law 31/1995 on occupational risk prevention.

In this respect, it is also important to point out that events that in the opinion of the licensee might have significant public impacts (including environmental variations and occupational accidents) must be brought to the attention of the CSN, as set out in CSN Safety Guide No. 1.6 on 'Reportable events at Nuclear Power Plants'.

4.6 Measures to prevent impacts on future generations greater than those permitted for the current generation

This principle of protecting future generations does not impact directly on the existing spent fuel management facilities and those in the licensing phase in Spain, since these are storage facilities whose design and operating lifetime, although not explicitly defined in all cases, is associated in principle with the lifetime of the operating nuclear power plants.

This is the case for the nuclear power plant pools and the existing on-site Individual Temporary Storage facilities (ITS) at the Trillo and Ascó nuclear power plants. In the case of the José Cabrera plant ITS, its lifetime is in principle linked to the completion of dismantling, and is thus also limited.

[1] *Law 21/2013 of 9 December on environmental assessment, described in Article 19.1*

As regards the centralised temporary storage facility (CTS), its lifetime is projected as 100 years. In all cases, these are time periods that are within normal intervals. The assurance that potential exposure will be kept as low as reasonably achievable is enabled by the application of the radiological protection criteria currently in force for the public and the environment, established in the Regulation on the Protection of Health against Ionising Radiations, or a fraction of these criteria. This fraction of the dose limit has been set at 0.1mSv/year in the limits and conditions included in the approval for the generic design of the CTS facility, issued in 2006, as was stated in previous reports.

Nevertheless, as pointed out in the previous section, taking into consideration that fuel and waste management activities may involve several responsible parties and cover longer periods, Article 38 of the Nuclear Energy Act, concerning measures to be taken by the organisations responsible for nuclear facilities, states that: *they shall adopt appropriate measures in all stages of spent nuclear fuel and radioactive waste management in order to ensure that persons, property and the environment are adequately protected, in the present and in the future.*

4.7 Measures to prevent undue burdens on future generations

The Spanish legislative framework had already established specific measures for this purpose, by means of the NEA, the Electricity Industry Act and the recently Royal Decree 102/2014 which repealed and replaced Royal Decree 1349/2003 on the regulation of ENRESA's activities and funding. These relate to the assignment of responsibilities, provision of funds for the financing of activities included in the GRWP and provisions regarding the requirements of institutional control.

The legislation establishes the responsibilities of the different agents involved in spent fuel management: the Ministry of Industry, Energy and Tourism, the regulatory body (CSN), producers and ENRESA, as detailed, amongst others, in Article 20 of this Report.

With reference to this section, the legal framework sets out the constitution, application, and management and guarantee mechanisms for the Fund for the financing of activities included in the GRWP, including spent fuel management. Details can be found in Annex F. By means of the provisions of this Fund, the generation benefiting from the production of electricity pays the costs associated with the waste generated until its disposal.

The Nuclear Energy Act also establishes that the State will assume ownership of the spent fuel once its disposal is undertaken and will also undertake any monitoring necessary following the decommissioning of a nuclear facility, once the period of time established in the corresponding authorisation has elapsed.

In this area, the recently adopted Directive 2011/70/Euratom has made clear the ethical obligation of each Member State to avoid imposing undue burdens on future generations with regard to spent fuel. It has also established the Community framework to ensure the safe and responsible management of spent fuel, with the aim of avoiding undue burdens on future generations.

Royal Decree 102/2014, which repeals and replaces Royal Decree 1349/2003 and completes the transposition into Spanish legislation of the Directive stipulates some aspects in this area:

- ✓ The Royal Decree's objective is 'the safe and responsible management of spent nuclear fuel and radioactive waste when it results from civilian activities, covering all stages, from generation to disposal, in order to avoid imposing undue burdens on future generations, in addition to the regulation of certain aspects related to the financing of these activities, within the obligations of the Community framework'.

- ✓ The General Radioactive Waste Plan must include in its content 'concepts or plans for the post-closure period of a disposal facility's lifetime, including the period during which appropriate controls are retained and the means to be employed to preserve knowledge of that facility in the longer term'. As was mentioned in the previous Report, the draft of the new GRWP which will specify this requirement is already being drawn up.
- ✓ It introduces a new authorisation for dismantling and closure for disposal facilities for spent nuclear fuel and radioactive waste, required to ensure the long term safety of the disposal system. It will also, where necessary, determine the areas of the site which must be subject to radiological or other types of surveillance and monitoring, during a specific period of time, as described in Article 19.4 of this Report.

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.

5.1 Changes to existing facilities

The only existing spent fuel management facilities in Spain, at the time of the Joint Convention coming into force, were the spent fuel storage pools at nuclear power plants, as can be seen in sections D.1 and D.3 of this Report. Currently, there are also three dry storage facilities, known as Individual Temporary Storage facilities (ITS), referenced in this and previous Reports.

The most important modifications carried out on the spent fuel storage pools in Spanish nuclear reactors, both previous and subsequent to the entry into force of the Convention have been described in previous National Reports. These changes are basically associated with the re-racking of fuel in borated stainless steel racks, which enables more compact placement of the assemblies and a subsequent increase in storage capacity. Additionally, as a result of the assessments carried out for this operation, modifications were made to the pools' cooling systems where necessary. Alongside these modifications, burnup credit was incorporated into the pressurised water reactor (PWR) plants.

During the period covered by this report, the most significant changes to the spent fuel storage pools were those outlined below.

- ✓ On 16 December 2012, the licensee of the Santa María de Garoña plant discharged all the fuel from the core (400 assemblies) into the irradiated fuel pool, in principle as a consequence of the taxation applicable to fuel within the plant, as reported to the Ministry of Industry, Energy and Tourism (MINETUR) and the Nuclear Safety Council (CSN).
- ✓ The gradual incorporation of modifications required by the CSN in its Supplementary Technical Instructions as a result of the stress tests carried out after the Fukushima-Daiichi (Japan) accident, which concern:

a) the alternative replenishing and spraying of pools;

b) control strategies for pool leakage;

c) the updating of instrumentation for measuring the level and temperature of the water in the pool;

d) improved distribution of the fuel assemblies in the pool, to optimise heat removal by surrounding the hottest assemblies with colder assemblies.

5.2 Measures adopted for the safety review of existing facilities

In general, the measures adopted for the safety review of the pools associated with the nuclear power plants are part of the safety assessment of the plants themselves and of the Periodic Safety Review (PSR) performed every ten years for each facility, coinciding with the renewal of the plant operating permit, in accordance with the stipulations of CSN Instruction IS-26.

During the period covered by this report, PSRs have been carried out at the Ascó and Cofrentes nuclear power plants.

Moreover, during this period development has continued on the safety review and monitoring measures that derive from the implementation and updating of the Plans for the Management of Radioactive Waste and Spent Fuel, a mandatory document required by the RNRF for the operation of nuclear facilities. Likewise, as a basic supplementary element to ongoing safety assessment, Basic Inspection Plan (BIP) inspections have continued of the existing storage facilities. This forms part of the integrated nuclear power plant supervision system (SISC), in accordance with the specific technical procedure of PT-IV-227 'Inspection of spent fuel and high level waste management activities'. These inspections have included the on-site temporary dry storage facilities (ITS) for spent fuel located at the Ascó, José Cabrera and Trillo plants.

Furthermore, amongst the notable measures adopted during this period was the stress test for the nuclear power plants, which included the spent fuel pools, carried out subsequent to the Fukushima Daiichi (Japan) nuclear power plant accident. As a result of this test, the CSN sent licensees a series of Supplementary Technical Instructions, requiring a series of studies and plans aimed at the optimisation of heat removal in the pool and damage mitigation for beyond design basis events involving the potential loss of large areas. This has resulted in the incorporation of improvements which have been mentioned in the previous section and which are summarised in Annex C of this Report.

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:

(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 6th General Radioactive Waste Plan (GRWP) currently in force contains the basic Spanish strategy for the management of spent fuel. The Plan includes provisions for the storage of spent fuel and high level waste based on a dry system ensuring the safety and protection of individuals and the environment over the periods of time required before disposal or very long-term management is undertaken.

The facilities planned for spent fuel management will be used for the storage of such fuel, whether centralised or individual. In general, the siting aspects to be considered will depend on whether a new site is used, as in the case of the Centralised Temporary Storage facility (CTS), or an existing nuclear power plant site, as in the cases of the ITS facilities at the Trillo, José Cabrera, Ascó I and II and Santa María de Garoña plants.

6.1 Projections for new spent fuel management facilities

For spent fuel, HLW and other radioactive waste that, in view of the technical, strategic and economic analyses performed, is not suitable for disposal at the solid radioactive waste disposal facility in Sierra Albarrana ('El Cabril'), the proposed management solution is based on the provision of a vault type CTS facility, whose operating period would be some 60 years.

A strategy based on a CTS facility was proposed to the Government in December 2004 by means of a unanimous resolution by the Congressional Commission for Industry, formed by representatives of all the parliamentary groups. Likewise, in its session held on 27 April 2006, the Commission for Industry approved a bill relating to the establishment of an Interministerial Commission responsible for setting out the criteria for the CTS facility for nuclear fuel and high level radioactive waste and its associated technology centre.

The site selection process, fully described in Article 6.1 of the Fourth National Report, and on which information can be found on the web page http://www.emplazamientoatc.es/Paginas/index.aspx, resulted in the Council of Ministers' Agreement of 30 December 2011, by which the Government approved the designation of Villar de Cañas (Province of Cuenca) as the chosen municipality for the location of the Centralised Temporary Storage facility for spent nuclear fuel and high level waste and its associated Technological Centre.

Once the site was designated by the Government, the licensing process began. This requires, in accordance with the RNRF, prior authorisation and construction and operating permits before it can begin operation, which is forecast for 2018. The RNRF, however, permits this type of facility to apply simultaneously for prior authorisation and the construction permit.

To this end, on 13 January 2014 ENRESA submitted to the MINETUR the applications for prior or siting authorisation and the construction permit for the CTS facility, which are currently undergoing evaluation by the CSN and the MINETUR, as detailed in Articles 6 and 7 respectively of this Report.

Furthermore, taking into account firstly the period required for the licensing and construction of a CTS facility and secondly the period of time projected until saturation is reached in the pools of the two units of the Ascó Nuclear Power Plant, it was considered necessary to construct an on-site facility for the dry storage of the plant's spent fuel (ITS) until the fuel can be transported to the CTS. The ITS facility is made up of two seismic resistant storage slabs, on each of which up to 16 storage modules will be placed, with a total capacity of up to 1,024 fuel assemblies from the two units. The licensing of this ITS, now operational, entailed the following procedures:

- ✓ Approval of the cask design and storage system, in accordance with the provisions of Article 80 of the RNRF, by Resolution of the Directorate General for Energy Policy and Mines of 1 February 2011, subject to a CSN report. The storage system selected is the same as that used for the ITS facility at the José Cabrera nuclear power plant (see Figure 5). It consists of a multi-purpose metallic canister confining the fuel, with capacity for 32 fuel assemblies, a storage module housing this canister during storage, and a transfer container for loading, unloading and transfer from the fuel pools to the storage module. The standard design of the storage module was slightly modified in order to adapt it to the fuel used in this plant. In addition, the Resolution of 27 November 2012 approved, subsequent to the CSN report, the certificate of approval for the transport container as a B(U)F Transport Package, in accordance with the requirements of Article 77 of the RINR.

- ✓ Licensing of the storage facility itself was processed as a plant design modification, in accordance with the procedures established in Article 25 and subsequent articles of the RINR. Since the design modification was considered far-reaching, it required authorisation for construction, which was granted by means of the Resolution of the Directorate General for Energy Policy and Mines of 29 September 2011, and authorisation for startup of the modification, granted by means of the Resolution of the Directorate General for Energy Policy and Mines of 9 April 2013, both subsequent to CSN reports. The first casks were loaded in May 2013.

- ✓ With regard to the facility's environmental impact, the project was subject to an environmental impact assessment, in accordance with Royal Decree 1/2008 of 11 January, approving the revised text of the Law on environmental impact assessment of projects, then in force. This process was finalised by the Resolution of 1 September 2011 of the Secretariat of State for Climate Change, issuing a favourable environmental impact statement for the project.

Similarly, the Santa María de Garoña plant will also require additional storage capacity for spent fuel, for which the licensee requested authorisation for the construction of a modification to the plant on 2 August 2013. This is currently undergoing assessment by the CSN and the MINETUR. As with the Ascó plant, it will also require authorisation for the startup for the modification, an Environmental Impact Statement, authorisation for the design of the storage system and approval for the model of transport package. The last two were requested on 15 July and 22 August 2013 respectively.

Issues related to the siting, construction and safety of these ITS facilities can be found in Articles 6.2, 7 and 8 of this Report.

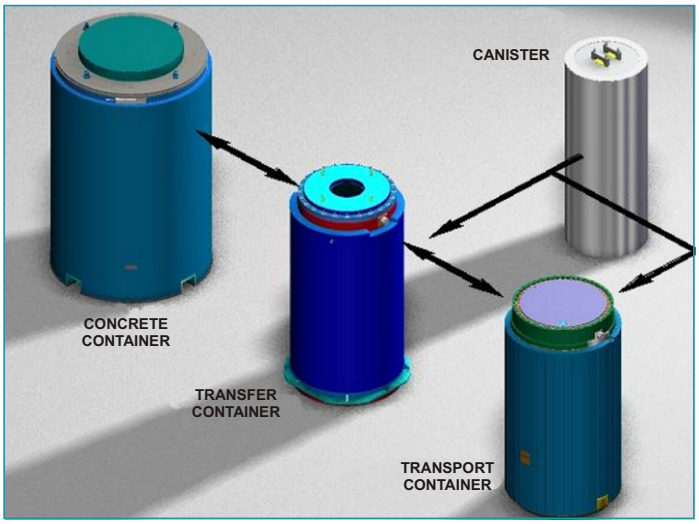


Figure 5. Storage system.

6.2 Measures to evaluate all relevant site-related factors likely to affect safety

The specific regulations setting out the measures to evaluate the site-related factors for nuclear facilities are detailed in CSN Instruction IS-26 on basic nuclear safety requirements applicable to nuclear installations, in Article 4 on 'siting'. Likewise, Instruction IS-29 on safety criteria in storage facilities for spent fuel and high level radioactive waste requires that the design of structures, systems and components significant to safety ensures the capacity to withstand the effects of site-related external events of human and natural origin.

Within the framework of the authorisation process for a new facility (detailed in Annex B of this Report), the analysis of the effect of the siting is set out in the series of authorisations included in Title II of the RINR. Specifically included as part of the required documentation for the application for prior or siting authorisation, the Study on the site characterisation and the area of influence of the facility is evaluated by the CSN. This study must include sufficient information on the parameters of the site that might impact on nuclear safety or radiological protection, including demographic and ecological data, and activities relating to land usage. The award of this authorisation is an official acknowledgement of the suitability of the selected site and allows application for the relevant construction permit and the start of work on infrastructure.

This information on the site is incorporated in the Preliminary Safety Analysis (PSA) which must be submitted with the application for the construction permit, with up-to-date information on site parameters, including those relating to land and water usage and any data which might contribute to a better understanding of the site. Subsequently and analogously, this site-related information is updated in the operating permit with data obtained during the construction phase and incorporated in the Safety Analysis. These applications must include plans for monitoring and verifying the basic representative parameters of the site.

Site-related factors are also evaluated in the operational phase, in the Periodic Safety Reviews (PSR) to which nuclear facilities are subject every 10 years, and in the applications for plant

modifications when these modifications affect any factor relating to land usage or to the conditions initially predicted at the site. Finally, the submission of a radiological study of the site and its area of influence is required with the application for dismantling and decommissioning.

In the case of the on-site individual temporary storage (ITS) facilities, both those in operation at the Trillo, José Cabrera and Ascó nuclear power plants, and the facility planned for the Santa María de Garoña plant, whose application has been submitted as a plant modification, safety analysis and assessment takes into account site characteristics, documented through successive plant authorisations, and their interface with the storage system, such that:

- ✓ Firstly, checks are carried out to ensure that the site-related factors are within the margins set out in the Safety Analysis for approval of the storage casks to be used, as required in Council Instruction IS-20 establishing safety requirements relating to spent fuel storage casks.
- ✓ Secondly, analysis is carried out on the site-related factors which might affect the design and placement of the concrete slab for the ITS.

Further details on the criteria applied to the assessment of the interfaces between the ITS facilities and their sites is included in the following section of this Report.

In the case of the projected ITS facility, licensing will follow the procedure set out in the legal framework applicable to nuclear facilities. This involves submitting, alongside the application for prior authorisation, the documentation on site characterisation, and alongside the application for a construction permit, the updated information on the site parameters and any data which might contribute to a better understanding of the site, as well as the plans for monitoring and verifying the site, as required by the RNRF and the CSN safety regulations. In addition, it must fulfil the requirements regarding the limits and conditions of the site contained in the approval for the generic design (without specific siting) of the CTS, issued by the CSN on 28 June 2006, on the basis of the provisions of Article 82 of the RNRF.

Since the Spanish Government's designation of the site of Villar de Cañas for the CTS at the end of 2011, the CSN has maintained close interaction with ENRESA for the monitoring of work prior to the submission of applications for prior authorisation and the construction permit, in order to ensure adequate application of the regulatory standards and criteria during this phase and to optimise the subsequent licensing process. These monitoring activities began in 2012 and continued throughout the present year, and have been focused on the following areas: quality assurance, site characterisation plan, physical safety and design criteria for the facility.

As a result of these activities a revision of the quality assurance programme has been published, which includes monitoring and supervision by ENRESA of the undertaking of the site characterisation plan.

As regards this site characterisation plan, during 2013, ENRESA reported to the CSN on the preliminary analyses for the plan, having identified the need to obtain additional data.

Meanwhile, in September 2013 the CSN received a query from the Directorate General for Environmental Quality and Assessment of the Ministry of Agriculture, Food and the Environment, concerning the scope and degree of detail required for the Environmental Impact Study (EIS) on the CTS, based on its most significant impacts. After assessing the initial document, the CSN, during its meeting of 23 October 2013, considered that the scope of the EIS should be extended in site-related aspects fundamentally concerning the description of the environment, updating socio-economic aspects and land usage, and the analysis of potential impacts of the construction process on surface and underground water, as specified in the written response to the query.

Finally, in virtue of the requirements of Articles 12.1a and 12.1b of the RNRF of 13 January 2014, ENRESA has submitted to the Ministry of Industry, Energy and Tourism the applications for prior or siting authorisation and for the construction permit, with the required accompany-

ing documentation for both, under Articles 14 and 17 of the RNRF. In accordance with the requirements of Article 2b of Law 15/1980 of 22 April, on the creation of the CSN, the Ministry issued an official request to the CSN on 14 January 2014 for the mandatory reports related to the submitted applications.

6.3 Criteria for the assessment of radiological impact on the environment and surrounding population

In accordance with Article 3.1 of IS-29, the general safety objective of the licensee of the Centralised Temporary Storage facility for spent fuel and high-level waste must be to protect individuals and the environment from the harmful effects of ionising radiation. Thus, they must demonstrate compliance with this objective in the Safety Analysis, both during normal operation and under abnormal conditions, such as in the event of an accident.

In the case of normal operation and operation under abnormal conditions, the acceptable radiation level is set in terms of an effective annual dose lower than 250 μSv to any member of the public located beyond the controlled area. For design basis accidents, the acceptable levels are set in terms of an effective dose lower than 50 mSv, equivalent dose to skin lower than 500 mSv and equivalent dose to the lens of the eye lower than 150 mSv, for any member of the public located beyond the controlled area. The definition of classification categories and acceptable limits are set out in Articles 3.4 and 3.6 of IS-29 respectively. The verification of these limits in the event of postulated initiating events is included in the analysis of accidents and their radiological consequences, which is incorporated in the facility's Safety Analysis, while the control of effluents and the external radiation level is subject to monitoring and control. With the aim of ensuring that the exposure of the population will be kept as low as reasonably achievable, operational restrictions can be established on the resultant dose.

The acceptable threshold of estimated frequency of an event is one in one million years for determining whether or not to undertake a detailed analysis of the effects of events of this type and of the possible measures to mitigate them. In all cases, the cut-off threshold value for an event to be considered as a design basis event should be established in the design bases. Consequently, internal or external events with a lower frequency of occurrence are considered beyond design basis events.

The site characterisation study set out in the prior authorisation must incorporate sufficient data on site parameters that might impact on radiological protection (RNRF, Article 14d). Subsequently, and as an integral part of the Preliminary Safety Analysis, the construction permit application (RNRF Article 17e) requires the submission of a radiological analysis, which estimates the theoretical potential radiological impact of the facility on the population and the environment, and the pre-operational environmental radiological monitoring programme, based on the conclusions obtained from the radiological analysis. This enables the establishment of the radiological baseline or reference level of the monitored area. Finally, during the operation of the facility, radiological analyses and an operational environmental monitoring programme are required, in order to assess the impact of the facility's operation (RNRF Article 20a).

In the case of the existing on-site individual temporary storage (ITS) facilities at the Trillo, José Cabrera and Ascó nuclear power plants, and the facility planned for Santa María de Garoña, assessment takes into account site characteristics, documented through plant licensing and review, and the interface with the storage system or casks, in accordance with specific criteria, which include the following:

- ✓ Events representative of altered and abnormal conditions that might occur during the lifetime of the facility, and the radiological consequences of very low probability

events. A theoretical aircraft strike required mitigation measures in the case of the ITS facility at José Cabrera.

✓ Aspects of radiological protection, including measurement of the dose rate at the limits of the controlled area and supervised area, extending the scope of the environmental radiological monitoring programme when considered necessary.

6.4 Public access to information on the safety of projected spent fuel management facilities

General issues relating to information and public participation (the role of the regulating body and other authorities, citizens' rights to information, local information committees for nuclear power plants, website, SISC, publishing of projected regulations, Law 21/2013, etc.) have been addressed in Article 20.2.7 of this Report. Consequently, the following highlights only those issues specifically concerning access to information on matters of safety with regard to spent fuel management facilities projected in this period, i.e. the CTS.

In accordance with the RNRF, once the application for prior authorisation for the CTS is received, the MINETUR must begin a period of public information, starting with the publication in the Official State Gazette and the corresponding regional gazette of an announcement outlining the facility's objective and main characteristics. This announcement must state that people and entities who consider themselves affected by the project may submit, within a limit of thirty days, appropriate written representations. This public information procedure, required by nuclear-specific legislation, must be carried out in conjunction with the corresponding requirements of environmental legislation (Law 21/2013).

6.5 International arrangements

Pursuant to Article 37 of the Treaty establishing the European Atomic Energy Community (EURATOM), of which Spain has been a member since 1986, it is necessary to provide the Commission with such general data relating to any plan for the disposal of radioactive waste (in whatever form) as will make it possible to determine whether the implementation of such plan is liable to result in the radioactive contamination of the water, soil or airspace of another Member State. However, in accordance with the Commission Recommendation of 11 October 2010 on the application of Article 37 of the Euratom Treaty, no plan for the disposal of radioactive waste has been subject to this requirement during the period covered by this Report.

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 Measures for limiting radiological impact

The general objective of radiological protection at spent fuel management facilities is established in the Nuclear Energy Act. Article 38 of the Act specifies *that appropriate measures shall be adopted in all phases of spent fuel and radioactive waste management in order to ensure the adequate protection of persons, property and the environment against radiological risk, both at present and in the future.*

This objective is also specified and developed in the Safety Instructions (IS) applicable to such facilities and issued by the Nuclear Safety Council (CSN), as indicated below:

- ✓ IS-26 on 'basic nuclear safety requirements applicable to nuclear installations';
- ✓ IS-29 on 'safety criteria at storage facilities for spent fuel and high level waste'.

Specifically, Instruction IS-29 requires that radiological protection is an objective taken into account by the licensee of the fuel storage facility in its design, construction and operation. To this end the necessary measures must be adopted to:

- ✓ limit, minimise and control the exposure of individuals to radiation and the release of radioactive materials into the environment;
- ✓ limit the probability of events that might lead to the loss of control over any radiation source;
- ✓ mitigate the consequences of such events should they occur;
- ✓ minimise the generation of radioactive waste.

This Instruction also requires that the licensee of the facility demonstrate in the Safety Analysis that these objectives are fulfilled, both during normal operation and under abnormal conditions and in the event of an accident. Likewise, the instruction also specifies the safety functions of these facilities and sets out the general design requirements for compliance with them.

In this respect, Article 17 of the Regulation on Nuclear and Radioactive Facilities (RNRF) requires that the application for the construction permit is accompanied by a Preliminary Safety Analysis containing information including the following:

- ✓ a description of the facility, with the criteria followed in the design of the safety systems and components on which the facility depends;
- ✓ an analysis of foreseeable accidents and their consequences;
- ✓ a radiological analysis with an estimate of potential environmental impact;
- ✓ an environmental monitoring programme based on the conclusions of this analysis.

In the case of on-site individual temporary storage (ITS) facilities at nuclear power plants, authorised as plant modifications in accordance with Articles 25 and 26 of the RNRF, the application for authorisation of the modification must be accompanied by the corresponding Safety Analysis.

These Safety Analyses are assessed by the CSN prior to the granting of the corresponding authorisation by the Ministry of Industry, Energy and Tourism (MINETUR).

Furthermore, in accordance with the provisions of Article 80 of the RNRF, the design of the storage casks and systems used at ITS facilities must be approved by the MINETUR, following CSN evaluation of the corresponding Safety Analysis, whose contents are detailed in the following CSN Instruction:

- ✓ IS-20, establishing 'safety requirements relating to spent fuel storage casks', which also includes design requirements.

These objectives and requirements were taken into account in the safety assessment for approval of the design for the casks and authorisation of the on-site ITS facilities at the Trillo, Jose Cabrera and Ascó nuclear power plants. The design characteristics of these ITS facilities and of the casks used in each of them have been described in previous national reports for this Convention.

As regards the on-site ITS facility planned for the Santa María de Garoña nuclear power plant, its licensing follows the same procedure as that established for the previous ITS facilities. This is an exterior facility, composed of two concrete slabs or platforms with capacity for dry storage of 32 casks (16 on each), which will in principle be ENUN-type dual-purpose casks, for storage and transport, designed by the Spanish company ENSA.

The corresponding applications for approval of the cask design, both as a storage cask and as a B(U) transport package, were submitted by ENSA in mid-2013, and the application for construction of the design modification for the ITS was also submitted by the licensee of the plant in mid-2013. The documentation accompanying the applications is under assessment by the CSN, with completion projected during 2014.

In the case of the CTS facility, besides the criteria and requirements set out in the applicable legislation, consideration will also be given to the design conditions included in the approval for the generic design issued by the CSN in July 2006 and in the reference standards specified in this approval.

7.2 Provisions for decommissioning

Point (ii) of this article of the Convention states that *'each Contracting Party shall take the appropriate steps to ensure that at the design stage, conceptual plans and, as necessary, technical provisions for the decommissioning of a spent fuel management facility are taken into account'*.

As can be seen in Annex B regarding the licensing process for facilities, Article 17 of the RNRF requires that the documentation to be submitted with *the application for the construction permit for nuclear facilities includes technological, economic and financing provisions for dismantling and decommissioning*. These dismantling and decommissioning provisions are described in greater detail in the application for the operating permit, as specified in Article 20 of the RNRF.

To this end, the report describing the technological, economic and financing provisions for future dismantling and decommissioning of the CTS facility was submitted as part of the application for its construction permit.

With regard to the ITS facilities at the Ascó nuclear power plant (operational since April 2013) and the Santa María de Garoña plant (in the licensing phase since August 2013), these licensing processes have been subject to the requirements of Articles 25, 26 and 27 of the RINR in so far as they are treated as design modifications to the facilities.

In accordance with the provisions of the RNRF, design modifications to nuclear facilities can be carried out provided they meet the safety criteria, conditions and regulations on which the facility's authorisation is based. If the design modification entails changes to these criteria, conditions and regulations, the licensee must request an authorisation for modification from the

MINETUR. Furthermore, if the modification is extensive or entails significant construction work, the MINETUR requires the licensee to request an authorisation for construction of the modification. In order to obtain this authorisation for construction, one of the licensee's obligations is the demonstration of the compatibility of the modification with the rest of the facility, to ensure the continued maintenance of its safety levels. Consequently, considerations for the decommissioning of the modification are taken into account, to the extent that they must be compatible with the decommissioning of the main facility.

7.3 Technologies used for spent fuel storage

The technology most widely used in Spain for the storage of spent fuel is wet storage in pools.

The Trillo and Ascó nuclear power plants also use dry storage technology for fuel, as will the Santa María de Garoña plant, once the licensing process for its ITS is complete. Similarly, the spent fuel from the José Cabrera nuclear power plant, undergoing dismantling, is already stored in an on-site ITS. In these cases, spent fuel is stored in casks made of metal or concrete (with a metal shell) that provide, besides the confinement of the radioactive material, the necessary shielding and structural support to withstand external demands.

The technology used at the Trillo nuclear power plant is based on the use of dual-purpose metallic casks (for storage and transport). Their multiple wall design (stainless steel – lead – stainless steel – neutron shielding – stainless steel) guarantees the confinement of the system monitoring the maintenance of pressure in the space between the two main layers of the cask. The casks are stored in a building constructed for this purpose.

The technology used at the Garoña ITS will also be dry storage, in ENSA EN UN 52 B dual-purpose metal casks (for storage and transport).

The technology chosen in the case of the José Cabrera and Ascó nuclear power plants is based on the use of welded metallic canisters inserted in metal and concrete modules for storage or in metal modules for transport. These casks are stored on-site in an outdoor facility, also specially constructed for this purpose. The dry storage system for spent fuel used at these nuclear power plants comprises a set of three components: the multi-purpose canister, the concrete and metal storage module or cask, and a transfer cask for loading the canister with fuel in the pool. The system also includes an additional cask for off-site transport of the canister, which has been approved as a B(U) waste package.

The strategy for the temporary management of spent fuel is the construction of a facility where storage will be centralised (the Centralised Temporary Storage facility, CTS), together with other high level or intermediate level long lived waste which is not suitable for disposal at El Cabril. The design of the CTS facility is also based on dry storage technology for spent fuel.

The CTS facility is based on technology for storage in welded canisters deposited in concrete vaults where the fuel's heat removal is accomplished by natural air convection. The design capacity is for 6,700 tU in fuel assemblies, plus the canisters with vitrified high level waste deriving from the fuel reprocessing from the Vandellós I, and other intermediate and long lived waste (special waste) not suitable for disposal at El Cabril. It is planned that the CTS facility will be an integral structure incorporating the following elements:

- ✓ Spent fuel reception area or building
- ✓ Processing building for conditioning of the fuel in the storage canisters
- ✓ Auxiliary services and systems building
- ✓ Storage modules for spent fuel canisters, each with two vaults with independent air inlets and outlets

- ✓ Storage module for special waste (intermediate level and long lived)
- ✓ Cask maintenance workshop
- ✓ Laboratory for spent fuel and radioactive waste

Also projected for the site is a cask storage building, principally for interim storage of the loaded casks which arrive at the facility.

In January 2014, ENRESA applied for both the prior authorisation and the construction permit, as permitted under Spanish regulations.

The vault technology chosen for the CTS facility has benefited from international experience in terms of its design, which is equally suitable for storage solely of spent fuel, solely of high level vitrified waste, or combined storage. In all cases the safety requirements have been adequately fulfilled.

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 a safety assessment prior to the construction and operation of storage and management facilities for spent fuel are established in the Regulation on Nuclear and Radioactive Facilities (RNRF). This requires the licensee to submit a Preliminary Safety Analysis with the application for the construction permit and a Safety Analysis with the application for the operating permit for nuclear facilities.

The contents of each of these safety analyses, the PSA and the SA, are also detailed in the RNRF, as referred to in Annex B of this Report. Amongst other requirements, these analyses should include a description of the site and the facility, an analysis of foreseeable accidents and their consequences, and a radiological analysis estimating the potential radiological impact on the population and the environment.

This requirement is developed in Safety Instruction IS-26 on basic nuclear safety requirements applicable to nuclear installations and in particular in Instruction IS-29 on safety criteria at storage facilities for spent fuel and high level waste, which emphasises the principle of defence in depth and protection by multiple barriers and passive safety. It also specifies that the objective of the licensee's safety assessment is to verify the capacity of safety-relevant elements and barriers to prevent accidents and mitigate their consequences should they occur. These Instructions also require the licensee to carry out the following:

> *an analysis of the risks entailed in the operation of the facility, in order to verify that all possible risk scenarios for the installation, including multiple failures, common cause failures and human errors, have been considered in accordance with their expected frequency and estimated severity, and that there are adequate preventive or mitigating measures in place to address such situations.*

Annex I of IS-29 contains a list of risks of on-site and off-site origin to be taken into account, including those caused by natural phenomena and those of human origin. Furthermore, this Instruction specifies that:

> *When a risk not previously considered is identified by means of the safety assessment, design changes must be made or operating procedures must be established to control it or additional measures must be implemented.*

Finally, these technical safety standards require the undertaking of a *Periodic Safety Review* at least once every ten years, by means of a systematic analysis of safety and radiological protection.

As regards the environmental assessment referred to in this article of the Convention, Spanish legislation, which incorporates the corresponding European Council and Parliament Directives, includes non-radiological environmental impact assessment in the authorisation process for the siting of nuclear facilities, in all cases prior to construction. These provisions apply to independent spent fuel storage facilities, such as the ITS or CTS facilities.

8.2. Application to the licensing of existing and planned facilities

The licensing of the pools associated with the design of the nuclear power plants is integrated into the licensing of the plants themselves and is subject to the procedure of the plant's Periodic Safety Review. The re-racking operations to increase storage capacity, carried out at all the operational plants, have been performed as plant design modifications in accordance with Articles 25-27 of the RNRF. The application for these modifications was accompanied by the corresponding Safety Analysis and the analysis of and proposal for the modifications associated with this operation, as detailed in previous National Reports.

The licensing of the on-site individual temporary storage (ITS) facilities at the Trillo, José Cabrera and Ascó plants has involved the following:

- ✓ The approval of the design of the storage cask or system in each case, in accordance with the provisions of Article 80 of the RNRF.
- ✓ Licensing of the storage facility itself, processed in all cases as nuclear power plant design and operational modifications, in accordance with the procedure established in Article 25 and subsequent articles of the RNRF.

Additionally, when the cask or one of the components of the storage system also fulfils transport functions (such as the dual-purpose cask for Trillo and the transport casks for the multipurpose canisters in the Jose Cabrera and Ascó systems), the approval of the design as a B(U) transport package is also carried out, in accordance with the Transport Regulation and subsequent to submission of the corresponding Safety Analysis.

This process is currently under way for the licensing of the casks and the projected ITS at the Santa María de Garoña nuclear power plant.

In the case of the centralised temporary storage (CTS) facility, licensing will follow the process of authorisations established for nuclear facilities in the RNRF and described in Annex B of this Report, which permits the simultaneous application for the prior authorisation and the construction permit, in accordance with Article 12.2 of the RNRF. The documentation to be submitted in each case will also meet the requirements specified in the RNRF for each authorisation.

In all cases, the Safety Analyses are evaluated by the CSN prior to the granting of authorisations by the Ministry of Industry, Energy and Tourism, in accordance with the functions attributed to the CSN in the law by which it was created and the provisions of the RNRF.

8.3. General framework for safety assessments and analyses

The general framework for safety assessments and analysis of spent fuel storage facilities is based on Spanish legislation, IAEA standards and the standards of the country of origin of the technology, or any other standard that may be used as a reference due to its comprehensiveness.

Specifically, the assessment of the ITS facilities and the storage casks in use has taken into account the requirements of the Joint Convention and the specific standards of the IAEA (currently included in Specific Safety Guide No. SSG-15: 'Storage of Spent Fuel', which replaces the previous Safety Series publications Nos. 116, 117 and 118). Regarding the standards of the country of origin of the technology, the following have been taken into account: US 10 CFR 72, the Standard Review Plans, including NUREG-1536, and US Regulatory Guide 3.62: *'Standard Format and Content for the Safety Analysis Report for Onsite Storage of Spent Fuel Storage Casks'*.

The areas of assessment in the case of storage casks have basically included: a general description of the cask; the main design criteria; structural assessment; thermal assessment; assessment of the shielding; and criticality analysis. There has also been assessment of operating procedures, acceptance criteria, maintenance procedures, radiological protection, and chapters on accident analysis, quality assurance and operating limits and conditions.

In the safety assessment of ITS facilities, the interface between the cask and the site characteristics of its location, as well as its conditions of use are taken into account. This involves both review and assessment of the documentation of the nuclear power plant affected by the construction and operation of the ITS facility (such as the Quality Assurance Programme, Technical Operating Specifications, Site Emergency Plan, Radiological Protection Manual, and Spent Fuel and Radioactive Waste Management Plan) prior to operation of the system.

All this experience has been incorporated into CSN Instructions IS-20, IS-26 and IS-29, which complete the Spanish regulations applicable to this type of facility. Specifically, both IS-26 and IS-29 will be applicable to the projected spent fuel storage facilities (the Santa María de Garoña ITS and the CTS), alongside the applicable reference standards, which in the case of the CTS facility is specified in the approval of the generic design issued by the CSN.

Finally, in relation to the CTS facility project, in order to ensure appropriate consideration of the legal framework and applicable regulations, and to optimise the licensing process, a close interrelationship has been maintained with ENRESA up to now, focused on the following four areas:

- ✓ Quality assurance programme
- ✓ Site characterisation plan
- ✓ Physical safety plan
- ✓ Facility design criteria

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 Operating permit: limits and conditions. Operational experience

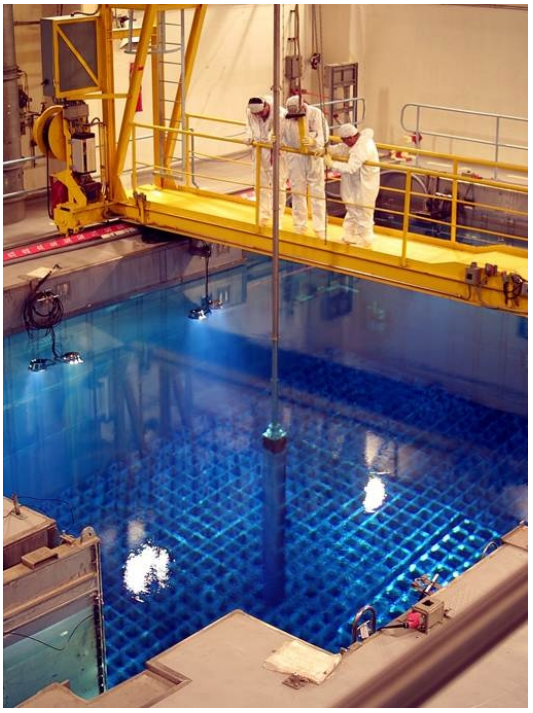
The spent fuel storage pools (SFSP) at all the currently operational plants have been assessed and authorised as part of the licensing process of the plants themselves. Consequently, the design requirements and operating limits and conditions included in the safety and environmental assessments are incorporated in the operating permits. These permits are awarded to the licensees on completion of the start-up programme (pre-nuclear and nuclear testing programme) that demonstrates that the facility, as constructed, fulfils the design and safety requirements.

In addition, the dual-purpose metallic cask storage facility is currently operational at the Trillo nuclear power plant, authorised as a design modification within the framework of the plant's operating permit in force, following the same licensing process as that of the original permit.

During 2013, the cask storage facility at the Ascó nuclear power plant became operational, similarly authorised as a design modification within the framework of the plant's operating permit.

The operating permit in force allows the licensee to possess and store slightly enriched fuel assemblies, in accordance with the technical limits and conditions included in the Refuelling Safety Report for each cycle, and with the limits and conditions associated with the specific authorisations for the storage of fresh and irradiated fuel.

During 2009, following the March 2008 granting of the authorisation for start-up of the storage facility at the José Cabrera plant, the spent nuclear fuel generated throughout the operating lifetime of the plant, consisting of 377 fuel assemblies contained in 12 casks, was transferred to this facility. These fuel assemblies were transferred to ENRESA pursuant to Order ITC/204/2010,



The pool at the Almaraz nuclear power plant.

of 1 February by the then Ministry of Industry, Tourism and Trade, which authorised the transfer of ownership of the plant from the previous owner (Gas Natural SDG, S.A.) to ENRESA and granted authorisation to undertake the plant dismantling plan in accordance with the nuclear safety and radiological protection limits and conditions established by the Nuclear Safety Council and contained in the Annex to the Order.

Nuclear power plant procedures include analysis of in-house and industry operating experience, potentially leading to the implementation of improvement actions in relation to both design aspects and operating procedures. Among the reports analysed are those produced by INPO/WANO, the US NRC and suppliers.

Spent fuel operations at nuclear power plants are carried out in accordance with the Technical Operating Specifications (TOS) and the Radioactive Waste Management Plan (PLAGERR), both of which are mandatory documents.

The TOS establish the Operational Limits and Conditions, their applicability, necessary actions, and the monitoring requirements necessary to comply with the limits and conditions. They also contain the limit values for variables affecting safety, the actuation limits of automatic protection systems, the minimum conditions for operation, the review programme, calibration and inspection or testing of various systems and components and their operational control.

For the development and detailing of TOS surveillance requirements, surveillance procedures are drawn up, which are carried out by the various departments involved in the operation of the plant.

The objective of a facility's Radioactive Waste Management Plan is to establish criteria and methods to ensure that the management of the radioactive waste and spent fuel generated at the facility is safe and optimised in the light of progress made in regulations and technology. It must take into account:

- ✓ the origin of the radioactive waste and the records for spent fuel;
- ✓ the current situation of the facility, in terms of generation and management of radioactive waste and spent fuel and, where appropriate, their transfer to other stages of subsequent management;
- ✓ interdependencies between the various stages of the management of radioactive waste and spent fuel;
- ✓ the study of management process and system alternatives and of their possible improvements;
- ✓ the justification of the suitability of the management that is carried out or the advisability of implementing improvements;
- ✓ the planning of implementation of identified improvements.

Specifically, the licensee of the facility must keep the inventory of waste and spent fuel up-to-date, minimise generation, and recycle and appraise the generated waste to the extent that this is technically and economically possible. Final waste, i.e. waste which is not suitable either for further treatment under the current technical or economic conditions or for the recuperation of value-bearing parts, must be conditioned for delivery to the authorised manager.

The Radioactive Waste Management Plan for each facility must take into account a series of risks, both radiological and non-radiological, associated with radioactive waste and spent fuel, in order to define global solutions. It must also take into account the operation of the treatment systems for liquid and gaseous radioactive waste.

9.2 Operating, maintenance, monitoring, inspection and testing procedures

Nuclear power plants have procedures in place to regulate the performance of various activities relating to the operation, maintenance, monitoring and inspection of the structures, systems and equipment that form part of the spent fuel storage facilities.

The facilities keep detailed inventories of the fuel assemblies deposited in the spent fuel pool, with the following information on each of the assemblies:

- ✓ 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 rods removed from fuel assemblies.

This information is updated at the end of each operating cycle, as required by the corresponding TOS and the Annual Report of the PLAGERR.

The monthly operating report sent to the CSN contains information on the storage conditions of the spent fuel pools and casks, and on possible variations with respect to the previous report, in-

cluding a list of the existing assemblies, accumulated burnup and the date of unloading from the reactor.

Additionally, the spent fuel storage systems are subject to monitoring, to ensure that: the spent fuel stored, either wet or dry, is maintained in subcritical conditions at all times in accordance with the TOS; the storage systems have an adequate rate of residual heat removal; exposure to radiation and radioactive substances during handling operations for spent fuel and during its storage (in pools or casks) is kept as low as is reasonably achievable (ALARA) and always below the regulatory limits (MPR); and the systems for monitoring radiation fulfil their design basis function.

The dry storage facilities (ITS) for spent fuel originating from the spent fuel pools are designed to store fuel assemblies once they have experienced a period of decay and cooling in the pools. Various operating, maintenance, monitoring, inspection and testing procedures have been developed to ensure the correct functioning of the modified plants. These include procedures for cask loading and handling, cask sealing, and transfer and unloading, in addition to those for dealing with abnormal events, malfunctioning and/or failure of handling equipment or systems and of the storage system.

9.3 Technical support and engineering services

Nuclear power plants have technical support and engineering services to facilitate compliance with and verification of safety criteria in spent fuel storage areas, within the scope described in the plant Operating Regulations.

Contracts with nuclear fuel suppliers and/or manufacturers stipulate technical support for the fuel assemblies supplied, which includes providing information on the characteristics and design of the assemblies, the operating limits for the guarantee of the fuel, and the plans and data. This is required by the nuclear power plant as a result, in turn, of the contracts between the plant and the company responsible for irradiated fuel services (ENRESA, transport of irradiated fuel, storage, etc.).

9.4 Reporting of incidents

The TOS of the nuclear power plants establish the conditions under which special reports should be produced in the event of incidents significant to the safety of the spent fuel storage facilities.

Reportable Events are communicated to the CSN and to the competent governmental authorities using the formats set out in CSN Instruction IS-10. Special Reports are sent to the CSN, as established in the TOS.

In addition, the CSN is responsible for the inspection and monitoring of nuclear power plant operation, and is empowered to carry out inspections in matters of nuclear safety and radiological protection.

9.5 Decommissioning

As established in the RNRF, the licensees of nuclear power plants draw up and update, as necessary, the decommissioning plans for their spent fuel management facilities, using the informa-

tion obtained during the operating lifetime of the facility. These plans are examined by the regulatory body.

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 is a broad international consensus on the option of disposal of SF and HLW in deep geological formations. In this regard, it should be pointed out that since 1985, Spain has been studying the different options for definitive disposal in deep repositories, in accordance with four basic courses of action:

- ✓ Candidate Site Plan (CSP), carried out until 1996. This plan has provided sufficient information to conclude that Spain has abundant underground granite, clay and, to a lesser extent, salt formations capable of hosting a disposal facility. Furthermore, the existence of a wide distribution of potentially valid locations has been verified. Specifically, between 1986 and 1996, an analysis of geological formations suitable for siting DGRs was carried out. As a result of this work, an Inventory of Candidate Formations has been compiled.
- ✓ Development of conceptual designs for a disposal facility in each of the identified lithologies, seeking maximum convergence between them.
- ✓ Performance of safety assessment exercises on the conceptual designs. These have integrated the expertise acquired from carrying out the tasks and projects deriving from successive ENRESA R&D plans, and have demonstrated that geological disposal allows for compliance with the applicable safety and quality criteria. A similar approach was taken to the generic design and to the safety assessment of both basic and conceptual designs for the repository, adapted to a host environment of granite or clay. This progress will constitute a solid basis for the initiation of the next stages, for site selection and implementation of the DGR.

  The following reports, requested in the 6th GRWP, have been produced from the results of these assessments:

  - ➪ Management options for irradiated fuel and high level waste
  - ➪ Viability of new technology: separation and transmutation
  - ➪ Basic generic projects:
    - Disposal in granite formations
    - Disposal in clay formations
  - ➪ Experiences in decision-making in relation to management of spent fuel and high level waste in certain countries in the OECD.
- ✓ ENRESA R&D plans have been further developed and adapted to the Spanish SF/HLW management programme. These plans have made it possible to acquire technical knowledge and set up national working groups for development of the dis-

posal option, participating in international research projects and in demonstration projects in foreign underground laboratories.

Alongside this, during recent years, a significant effort has been made in research on the various separation and transmutation (S&T) technologies. The scale of these programmes makes international participation essential. The majority of work carried out is preliminary in nature, obtaining basic data and viability analyses, with a predominantly theoretical content, although it is planned in the next Euratom Framework Programmes to initiate projects aimed at studying industrial viability.

According to Directive 2011/70/Euratom, which recognizes that it is broadly accepted at the technical level that, at this time, deep geological disposal represents the safest and most sustainable option as the end point of the management. The proposal for the 7th GRWP submitted by ENRESA considers that the basic and preferred option is storage, followed by a disposal facility, which for the purpose of economic calculations and planning would begin operation in 2063.

The main long-term courses of action in relation to the development of a disposal facility for SF and HLW are as follows:

- ✓ Updating knowledge and technology on the basis of available information and the development of international R&D programmes associated with technological platforms within the European Union framework, and specific achievements produced in other more advanced programmes.
- ✓ Development of a procedure and a programme for decision-making in site selection, taking into account experience gained from the process of site designation for the CTS as well as international experience in this area.
- ✓ Development of a generic preliminary project for the facility, as well as performance evaluation methodology, taking into account the basic designs, the positive effect of the longer cooling time provided by the CTS and the updating of knowledge.
- ✓ Proposal for a legislative and regulatory framework in line with international developments.

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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 ensure the maintenance of subcritical conditions and heat removal

In the Spanish regulations governing waste management there are several examples of measures to ensure the maintenance of subcritical conditions and heat removal. Instruction IS-26 on basic nuclear safety requirements applicable to nuclear facilities sets out that the licensee of the nuclear facility must analyse whether at least the following essential safety functions are applicable to it: reactivity control; residual heat removal and radioactive material confinement and shielding. More specifically for spent fuel and high-level waste storage facilities, Instruction IS-29 lists the safety functions to be incorporated into these facilities during their life cycle in both normal

operation and abnormal or accident conditions. These are as follows: subcriticality control, confinement, residual heat extraction, protection against radiation by means of the use of suitable shielding materials and densities, and retrievability.

As has been stated previously, the CTS facility projected in the GRWP in force, whose generic design was approved by the CSN in June 2006, will hold not only the spent fuel from Spanish nuclear power plants but also the high and intermediate level waste resulting from the reprocessing of spent fuel in other countries and other waste that, due to its radiological characteristics, is not suitable for disposal at the El Cabril disposal facility.

Due attention has been paid in the design of the CTS facility to maintaining subcriticality during the management of radioactive waste resulting from reprocessing, as described in Article 4.1 of Section G. The remaining high and intermediate level waste that is planned to be stored at the CTS is not liable to reach critical conditions, due to its characteristics.

Limitations have been established on the content of fissionable materials as part of the acceptance criteria to be met by waste packages for disposal at the El Cabril LILW disposal facility.

As regards measures to ensure heat removal, the situation is similar to that described above. Of the waste mentioned, only the high level vitrified waste, currently in France, generates considerable amounts of heat, which has been taken into account in the assessment of the Safety Analysis for the generic design of the CTS facility approved by the CSN. This is currently the object of detailed study as part of the licensing process.

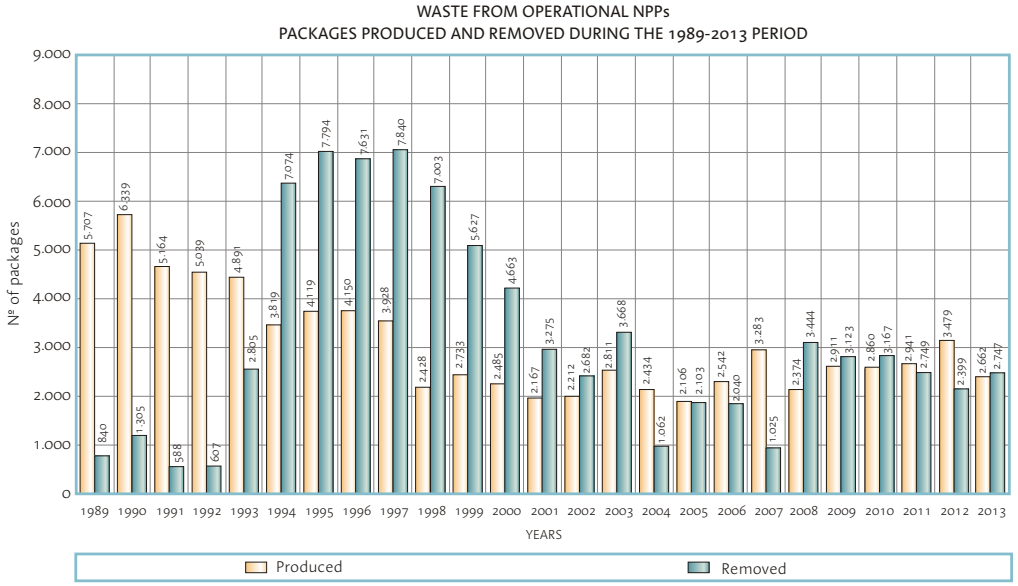
11.2 Measures to ensure that the generation of radioactive waste is kept to the minimum practicable

The principle of waste production minimisation is established in Spanish legislation in Article 38 of the Nuclear Energy Act (NEA), which requires producers to adopt appropriate measures to ensure that waste production is kept as low as possible, in terms of both quantity and radioactivity, according to current scientific practice. The minimisation of waste is also one of the guiding principles for waste management, in accordance with the new European Directive on waste, and it is incorporated as such in Royal Decree 102/2014, which transposes this Directive (Article 3).

The CSN has encouraged the implementation of this practice by requiring ENRESA to make optimum use of the disposal capacities at El Cabril. Among other measures, ENRESA has worked with the nuclear power plants to determine and implement volume reduction projects at these facilities. It has been possible to reduce the annual production figures from the 6,500 waste packages (1,430 m^3) generated in 1990 to the approximately 2,500 packages (600 m^3) currently generated by the fleet of operational nuclear power plants. These figures are very close to the minimum levels that can technically be expected, and thus no significant reductions are expected in the future.

Similar measures are ongoing at all the radioactive facilities, whose owners have joined forces with ENRESA in an effort to reduce the quantities of radioactive waste generated. During the period 1992 to 2003, the annual volume of waste removed was halved, from some 140 m^3 to approximately 70 m^3. Since mid-2003, and as a result of the publication of Order ECO/1449 by the Ministry of Economy, there has been a significant reduction of waste generation by this category of producers. The current generation values stand at around 25 m^3 per year.

Similarly, the licensees of nuclear facilities have clearance projects in place, in line with Nuclear Safety Council Instruction IS-31 of 26 July 2011 on criteria for the radiological control of waste materials generated in nuclear facilities.



In the case of the operational plants, UNESA and the CSN have developed a methodology which is applied to the clearance of four waste streams: scrap metal, resins, activated carbon and wood. ENRESA applies the same methodology in its ongoing dismantling projects, PIMIC and the José Cabrera nuclear power plant. The quantities of clearable materials generated as of 31 December 2013 amount to 771 tonnes for the José Cabrera plant project and 5,158 tonnes for the PIMIC project.

Table 10: Quantities of clearable materials generated by PIMIC and nuclear power plants up to 31 December 2013.

	SCRAP	COMPACTABLE	VENTILATION FILTERS	CONCRETE	SOIL	OTHER	TOTAL
PIMIC	397	2	3	1,705	2,831	71	5,009
JOSÉ CABRERA NPP	396	3	0.5	205	85	82	771.5

11.3 Measures to take into account interdependencies among the different stages of radioactive waste management

Article 4.7 of this Report makes reference to the consideration of the interdependencies between all stages of the management of radioactive waste and spent fuel as a principal element of the

Spanish legal and regulatory framework. It also refers to the introduction of this principle in the new Directive 2011/70/Euratom on waste, and its transposition in Royal Decree 102/2014 (Article 3b).

Taking interdependencies into account is a condition of the licensing process for nuclear facilities. In the case of nuclear power plants, the licensee is specifically required to draw up and implement a Process Control Programme (PCP) for the operation of the systems for the treatment and conditioning of waste for its disposal.

As regards 2nd and 3rd category radioactive installations for medical, industrial or research purposes, Ministerial Order ECO/1449/2003 (Official State Gazette No. 134 of 5 June 2003) specifies the different aspects to be taken into account in the management of radioactive waste originating from these installations.

The CSN requires ENRESA to produce a methodology for the acceptance of waste packages at the El Cabril disposal facility, as well as a set of technical and administrative procedures for its practical implementation, encompassing both the relationship between ENRESA and the waste producers, and activities that are the exclusive responsibility of ENRESA in the acceptance of the various types of waste packages.

The acceptance criteria for LILW waste packages were established in accordance with the Ministerial Order of 9 October 1992. The operating permit currently in force for the El Cabril disposal facility, granted by Ministerial Order on 5 October 2001, determines that the acceptance criteria for waste at this facility are part of the official operating documentation.

ENRESA has established a methodology for the acceptance of LILW and VLLW at the El Cabril disposal facility.

The producers of radioactive waste at nuclear facilities are responsible for the conditioning of the waste packages such that they fulfil the acceptance criteria. ENRESA must verify that the waste packages comply with these requirements by means of a preliminary acceptance process. Surveillance has also been set up, based on inspections on receipt, documentary and on-site controls of waste production, and the performance of scheduled verification tests on the actual packages received.

The CSN requires ENRESA to produce specific acceptance processes taking into account producers of disposal units for direct disposal in the vaults at El Cabril. To this end, during the period covered by this Fifth National Report, ENRESA has prepared the documentation permitting the production of these units for the LILW generated during the José Cabrera nuclear power plant dismantling project.

Previously, these processes were carried out exclusively at ENRESA's installations at the El Cabril disposal facility.

In the case of HLW, Instruction IS-29, on safety criteria in storage facilities for spent fuel and high level radioactive waste, sets out that the mandatory Safety Analysis, required by the RNRF for the licensing of the facility, must include acceptance criteria for spent fuel and radioactive waste containers. This Instruction also sets out that the licensee must carry out Periodic Safety Reviews, in accordance with current legislation, including deviations from the acceptance criteria and limits during storage and changes occurring in the interdependencies among the different stages of SF and HLW management. If a significant change is proposed to the acceptance criteria for spent fuel and waste containers, the safety of the facility must be reviewed independently of the periodic safety reviews.

11.4. Measures to 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

Article 38 of the NEA requires the licensees of nuclear and radioactive facilities to adopt appropriate measures in all phases of spent fuel and radioactive waste management in order to ensure the adequate protection of persons, property and the environment against radiological risk, both at present and in the future.

Additionally, Royal Decree 102/2014 of 21 February 2014, on the safe and responsible management of spent nuclear fuel and radioactive waste, has completed the legislative, regulatory and organisational framework in accordance with Council Directive 2011/70/Euratom.

The legal provisions of Article 12.3 of the Decree state that during the authorisation process for radioactive waste management facilities, a Safety Analysis or demonstration is required for the different stages of the facility's life cycle, in accordance with the requirements of the RNRF. It also states the safety demonstration will be commensurate to the complexities of operations and the scale of the associate risks, in accordance with Nuclear Safety Council Instructions, circulars and guides.

Currently, the national regulatory framework underlines the importance of both direct protection mechanisms for individuals and the environment, and mechanisms for long term safety, since in radioactive waste management, the residual radiological risk for individuals and the environment needs to be controlled over long periods of time.

During the licensing and monitoring of the El Cabril facility, the safety principles and criteria issued by international organisations such as the International Commission on Radiological Protection and the International Atomic Energy Agency have been considered to be directly applicable. Specific safety requirements set out in the regulations of other countries where reference facilities are located have been introduced.

11.5 Measures taking into account the biological, chemical and other hazards that may be associated with radioactive waste management

Biological, chemical and other risks associated with the management of radioactive waste are regulated by limitations on the content of substances present in the waste for disposal at the El Cabril disposal facility.

In this respect, a fundamental component in preventing these risks is the disposal facility's acceptance criteria. Among other restrictions, these include limiting the presence of substances whose main potential risk does not arise from radioactivity and substances capable of producing exothermic chemical reactions. Waste producers are responsible for declaring the presence of toxic, chemical or biological substances in radioactive waste. They must also minimise the generation of these substances and identify them, enabling ENRESA to log their quantities at the facility. ENRESA collaborates with the technical staff at the nuclear power plants to address specific aspects of this issue.

The environmental impact assessment process to which nuclear facilities are subject as part of the authorisation and licensing process is another preventive method for addressing the issue of biological and chemical risk.

11.6 Measures to prevent impacts on future generations greater than those permitted for the present generation

As already discussed in the Fourth National Report to the Joint Convention, as of 1985, the CSN has stated that the basic objective of radioactive waste disposal facilities, from the point of view of nuclear safety and radiological protection, is to ensure that radioactive waste is isolated from humankind and the environment, in such a way that potential releases of nuclides do not result in the unacceptable exposure of individuals to radiation, both for present and future generations.

Additionally, Royal Decree 102/2014 of 21 February 2014, on the safe and responsible management of spent nuclear fuel and radioactive waste, has completed the legislative, regulatory and organisational framework in accordance with Council Directive 2011/70/Euratom.

Specifically, this provision establishes the objective of the regulation of safe and responsible management of radioactive waste and spent fuel for the purpose of avoiding imposing undue burdens on future generations. It also sets out the necessity of using passive safety systems with components whose functioning is ensured by physical principles which are not dependent on external energy.

Royal Decree 102/2014 also requires that the costs for the management of spent fuel and radioactive waste shall be borne by those who generated those materials, to avoid imposing undue burdens on future generations.

11.7 Measures to avoid imposing undue burdens on future generations

The Spanish legislative framework had already established specific measures for this purpose, by means of the NEA, the Electricity Industry Act and the recently repealed and replaced Royal Decree 1349/2003 on the regulation of ENRESA's activities and funding. These relate to the assignment of responsibilities, provision of funds for the financing of activities included in the GRWP and provisions regarding the requirements of institutional control.

The legislation establishes the responsibilities of the various agents involved in spent fuel management: the Ministry of Industry, Energy and Tourism, the regulatory body (CSN), waste producers and ENRESA, as detailed amongst others in Article 20 of this Report.

With reference to this section, the legal framework sets out the constitution, application, and management and guarantee mechanisms for the Fund for the financing of activities included in the GRWP, including radioactive waste management. Details can be found in Annex F. By means of the provisions of this Fund, the generation benefiting from the applications which generate radioactive waste pays its associated costs until its disposal.

The Law also establishes that the State will assume ownership of the radioactive waste once its disposal is undertaken and will also undertake any monitoring necessary following the decommissioning of a nuclear or radioactive facility, once the period of time established in the corresponding authorisation has elapsed.

The El Cabril LILW disposal facility has been designed on the basis of a concept of passive safety that will function throughout its operating life and during the closure phase. Passive safety implies that after closure, the facility will not depend on ongoing and large scale active measures but will instead be subject to active and passive institutional controls reinforcing its safety and ensuring compliance with the safety criteria specified by the regulatory authorities.

In this regard, the recently adopted Directive 2011/70/Euratom has made clear the ethical obligation of each Member State to avoid imposing undue burdens on future generations in respect of spent nuclear fuel and radioactive waste including any radioactive waste expected from the decommissioning of existing nuclear installations. It has also established the Community framework for ensuring responsible and safe management of spent fuel and radioactive waste to avoid imposing undue burdens on future generations.

Royal Decree 102/2014, which repeals and replaces Royal Decree 1349/2003 and completes the transposition into Spanish legislation of the Directive, stipulates particular aspects in this regard:

- ✓ The Royal Decree's objective is *'the safe and responsible management of spent nuclear fuel and radioactive waste when it results from civilian activities, covering all stages, from generation to disposal, in order to avoid imposing undue burdens on future generations, in addition to the regulation of certain aspects related to the financing of these activities, within the obligations of the Community framework'*.
- ✓ The General Radioactive Waste Plan must include in its content *'concepts or plans for the post-closure period of a disposal facility's lifetime, including the period during which appropriate controls are retained and the means to be employed to preserve knowledge of that facility in the longer term'*. As previously mentioned in this report, the draft of the new GRWP, which will specify this requirement, is already being drawn up.
- ✓ The radioactive facilities in the nuclear fuel cycle whose dismantling and closure is not covered by the Fund for the financing of activities included in the GRWP require, prior to their startup, the submission of a financial guarantee against future dismantling and management of the resulting radioactive waste, as described in Article 22.2 of this Report.
- ✓ It introduces a new authorisation for dismantling and closure for disposal facilities for spent nuclear fuel and waste, required to ensure the long term safety of the disposal system. It will also, where necessary, determine the areas of the site which must be subject to radiological or other types of surveillance and monitoring, during a specific period of time, as described in Article 19.4 of this Report.

ARTICLE 12
EXISTING FACILITIES AND PAST PRACTICES

Article 12. Existing facilities and past practices

Each Contracting Party shall in due course take the appropriate steps to review:

(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 suffi-

cient to justify the harm and the costs, including the social costs, of the intervention.

12.1 Measures for reviewing the safety of the El Cabril facility

The mechanisms adopted for reviewing the safety of the El Cabril facility described in the Fourth National Report to the Convention are still in force.

Since the previous report, the Periodic Safety Review has been carried out on the El Cabril facility, with the corresponding global evaluation of safety and radiological protection for the facility during the 2002-2011 period.

In 2013 the CSN launched a pilot scheme for the establishment of a biennial system of specific monitoring and supervision for the facility. Amongst its purposes is to provide a basis on which the inspection scheme can be adapted on points such as focus areas, frequency and resources.

a) The system is based on the verification of the facility's operation in accordance with regulations, applicable authorisations and other established requirements for its operation.

b) The supervision process derives from the collection of information from the facility's performance indicators, and inspections and assessments carried out by the CSN.

c) The process continues with the evaluation of this information: for performance indicators, by means of the comparison of these values with determined threshold values; for inspections and assessments, by means of the categorisation of any deviations found.

LILW vaults at ENRESA's El Cabril disposal facility.

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.

Spain has a comprehensive solution to the issue of low and intermediate level radioactive waste (LILW) management in the form of the El Cabril disposal facility, an essential part of the national LILW management system, in accordance with the limits and conditions established in the facility's operating permit. However, in view of the expected increase in waste to be managed as a result of the dismantling of nuclear power plants, including the dismantling of the José Cabrera plant initiated in 2010, and in case of incidents at other facilites, a supplementary installation was designed for the disposal of very low level radioactive waste at the El Cabril disposal facility, the first vault of which (from a total of four planned vaults) became operational in 2008. The construction of the three remaining vaults will be undertaken as and when waste management capacity requires it. Work on the second of the four vaults has been approved by the CSN, and construction has already begun, as detailed in Article 13.1.1 of this Report.

As regards the management of HLW and SW, the Centralised Temporary Storage facility (CTS) and its associated Technology Centre, which will be located in the vicinity of Villar de Cañas, have been in the licensing phase since January 2014, as has already been detailed in Article 6.1.

The dismantling of the José Cabrera nuclear power plant has required the licensing of a plant design modification for the ITS which currently holds all the plant's SF to enable it to accommodate 4 additional casks for reactor internals, considered as radioactive waste which, due to its characteristics, is not suitable for disposal at the El Cabril facility.

13.1 Provision of new radioactive waste management facilities

13.1.1 Low and intermediate level waste (LILW)

As stated in the Fourth National Report, since October 2008 the disposal of VLLW has been undertaken in a supplementary installation at the Sierra Albarrana solid radioactive waste disposal facility (El Cabril). Its authorisation for startup was granted by the MINETUR on 21 July 2008, subsequent to a favourable report by the Nuclear Safety Council.

The design of this facility comprises four disposal vaults (numbered 29, 30, 31 and 32), with a total capacity of 130,000 cubic metres of VLLW.

In 2014, ENRESA launched the project for the construction of vault 30, with an estimated capacity of 39,000 m^3.

Disposal vault 30, within the supplementary VLLW disposal installation at the El Cabril disposal facility, will be sited on a natural depression in the land, located immediately to the north of Disposal vault 29.

The guidelines adopted for the vault design are based on the following technical considerations:

- ✓ adaptation to the existing topography;
- ✓ geological and geotechnical stability of the site's terrain;
- ✓ ease of hydrogeological control;
- ✓ potential for usage by means of successive sections;
- ✓ ease of access from the exterior.

Vault 30 has been designed with two operating sections (I and II) for the disposal of waste, positioned one above the other. Below each there will be a downstream containment dike. Both sections will be surrounded by berms to enable vehicle access around them.

Interior protective layers will be laid on the base and sides of the vault, and final protective layers will cover section II, thus creating an isolated and protected enclosure for waste disposal.

Figure 6. Aerial view of the very low level waste facility.

During operation, waste is protected from rainfall at all times by means of a moveable shelter positioned above the vault.

Each of the two sections will have its own leachate drainage network. These will meet in the rockfill dike through a common outflow to the leachate control tank, downstream from the vault. This network will function as a rainwater drainage system for the pit until it becomes operational.

As each of the disposal vaults is filled, they will be closed with a final covering layer consisting of several layers of earth, clay and gravel, among other components, and a final layer of topsoil.

13.1.2 High level waste (HLW) and special waste (SW)

As has been explained in Section B, the temporary management of these types of waste will be undertaken together with that of spent fuel, requiring a centralised storage facility. This facility has been described in Section G, sub-section 6.1.

Nevertheless, the need for storage for radioactive waste deriving from the dismantling of the José Cabrera nuclear power plant, including reactor internals and other fuel-related operational waste (attachments, pieces of structural elements for the fuel, etc.) has required the design and manufacture of four new casks. These were loaded and emplaced in the on-site ITS during the second half of 2013. Unlike in the case of spent fuel, Spanish regulations do not require additional licensing for storage casks for radioactive waste; the authorisation procedure for the loading and storage of this waste was carried out under the authorisation of the design modification for the ITS for its use as a radioactive waste storage facility (in accordance with condition 5.2 of Annex I of the Ministerial Order awarding ENRESA the dismantling authorisation). The application, made by ENRESA on 25 January 2011 and accompanied by the necessary preliminary analysis, safety assessment and safety analysis, was approved by the MINETUR on 25 April 2013.

Meanwhile, the decision on the definitive disposal facility for spent fuel and high level waste has been postponed, as a result of which no facility of this type has yet been projected.

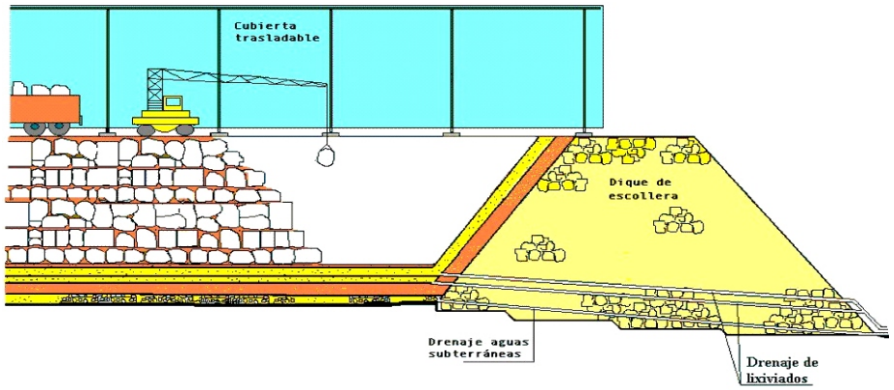


Figure 7. Detail of a VLLW disposal vault under construction.

13.2. Criteria for evaluating all relevant site-related factors likely to affect safety

A distinction is made in this section between Low and Intermediate Level Waste (LILW), all of which may be disposed of at the El Cabril disposal facility, and all other waste which, due to its radiological characteristics, is not suitable for disposal at the El Cabril facility. These constitute Special Waste (SW) and High Level Waste (HLW).

a) LILW

The criteria and factors taken into account for the El Cabril disposal facility, which were presented during the licensing process for the installation prior to its startup in 1992, are representative of the methodology and systematic approach to assessment used in Spain for any new site.

The acceptability of the radiological consequences of potential releases into the environment depends on two factors:

- ✓ The scale of potential releases of radionuclides, which in turn depends on the physical and chemical form of the waste deposited and the action of natural and engineered barriers preventing its migration.
- ✓ The nature of the potential release, depending on the quantities and types of radionuclides present in the waste.

These factors were taken into account in the Safety Analysis for the El Cabril disposal facility. The assessment was carried out in accordance with the specific regulations applicable to the reference facility. Since this facility is French, the corresponding regulation was Basic Safety Rule I.2. This Rule sets out the concept of intrinsic safety, which consists basically of the following requirements for disposal systems (waste and engineered barrier):

- ✓ minimisation of the transfer of radionuclides to the environment during the operating and monitoring phases;
- ✓ in the unrestricted usage phase, safety based on limitation of inventory and the characteristics of the geological barrier.

Also taken into account were the two fundamental criteria for the siting of this type of facility: isolation from ground and surface waters, and control of possible discharges in the event of radiation releases as a result of assumed failures.

This Rule also establishes a maximum 300 years design life of the waste isolation devices (engineered barriers). Consequently, it is estimated that the monitoring and surveillance phase should not exceed this period at the El Cabril disposal facility. This duration may be re-evaluated on the basis of the amount of radioactivity actually deposited being lower than the envelope considered in the radiological impact analysis, at the end of the operating phase.

The very low level waste (VLLW) installation, operational as of 2008, constitutes a modification to the initial design plans of the disposal facility. In compliance with Spanish regulations, and in particular the RNRF, its construction required authorisation for the modification of the pre-existing facility.

The reference facility for this installation is the French very low level radioactive waste disposal facility at Morvilliers. The supporting documentation for the new disposal facility includes information pertinent to the criteria for evaluation of site-related factors likely to affect safety.

The following suitability criteria have been taken into account in weighting the site characteristics, and these are revised periodically in the context of the facility's periodic safety review, which is performed at least once every ten years:

1. Adequate lithological characteristics
2. Low and tectonically stable seismic activity
3. Known hydrogeology which can be modelled
4. Known hydrogeochemistry
5. Even or levellable topography not susceptible to flooding
6. Adequate geotechnical properties
7. Preservation of areas potentially usable for extension of the facilities
8. Availability of sufficient information on the site
9. Accessibility and communication
10. Proximity to current facilities

b) HLW and SW

In general, aspects relating to site assessment are taken into account throughout all phases of licensing for nuclear facilities; specifically, they are the object of the prior authorisation. This authorisation, which is accompanied by a characterisation study of the site and the area affected by the facility, includes sufficient data on any site parameters that might impact on nuclear safety or radiological protection, including demographic and ecological data, and on activities relating to land usage. The scope of these studies depends on the complexity and lifetime of the facility.

ENRESA's application for usage of the José Cabrera nuclear power plant ITS for the storage of SW generated by the dismantling of this plant, prior to future transfer to the CTS, has not entailed elements requiring revision of the Safety Analysis of the facility.

13.3 Criteria for the assessment of radiological impact on the environment and surrounding population

As in the previous section, a distinction is made between, on the one hand, Low and Intermediate Level Waste (LILW) and, on the other, Special Waste (SW) and High Level Waste (HLW).

a) LILW

When the Safety Analysis was carried out at the El Cabril disposal facility, an important part of it focused on the assessment of the potential radiological impact of the site during the facility's three phases of operation:

- ✓ in the operating phase, activities relating to waste handling and treatment were studied;
- ✓ in the monitoring and surveillance phase and the unrestricted usage phase, consideration was given to situations involving the performance of the disposal facility itself.

Scenarios of normal operation, accident situations and human intrusion during the unrestricted usage phase were analysed. Specific hypotheses for each of these situations were generally selected by maximising the doses to the critical individual, in such a way that these situations might be considered as the most detrimental from the point of view of impact, establishing a maximum level.

As in the case of the previous facility, the VLLW facility is subject to safety objectives oriented to the protection of individuals and the environment.

The VLLW facility is a modification of the existing facility, and as such was included in the SA of the El Cabril disposal facility, using the same criteria and methodology and without change to the facility's maximum authorised radioactive inventory. As in the previous SA, the situations analysed include present and future conditions, events associated with the normal evolution of the disposal facility and more unlikely events such as intrusion. The analysis has a dual objective:

- ✓ the development of acceptance criteria for the definitive management of VLLW;
- ✓ the verification of the existence of an acceptable level of protection for human health and the environment at present and in the future.

The methodology for the analysis is based on that established in international forums, such as the ISAM and ASAM projects organised by the IAEA, and includes the following main elements:

- ✓ The context of the analysis, identifying its timeframe, objectives, radiological protection and safety criteria, etc.
- ✓ A description of the system or of the characteristics of its main components: waste, operating practices, design of facilities, etc.
- ✓ Development and justification of scenarios and their evaluation. These scenarios support the two stated objectives.
- ✓ Analysis of results.

b) HLW and SW

As has been stated above, the Centralised Temporary Storage (CTS) facility projected in the GRWP in force, whose generic design was approved by the CSN in June 2006, is designed to hold all the fuel assemblies from Spanish nuclear power plants, high and intermediate level waste from the reprocessing of all the fuel assemblies from the Vandellós I NPP, and other waste that, due to its radiological characteristics, is not suitable for disposal at the El Cabril disposal facility.

The measures for assessment of the radiological impact on the environment and surrounding population, corresponding to the CSN approval for the generic design of this facility, the pre-licensing phase, are included in Section G, Sub-section 6.3 of this report, on spent fuel. The contents of this section are also applicable to HLW and SW, since the facility is the same in both cases.

As indicated in 13.2, the ITS design modification to the José Cabrera nuclear power plant has not entailed changes to the radiological criteria for this facility, since it is below the established limits.

Currently, there is no facility in Spain projected for the definitive disposal of HLW.

13.4 Public access to information on the safety of projected radioactive waste management facilities

General issues relating to information and public participation (the role of the regulating body and other authorities, citizens' rights to information, local information committees for nuclear

power plants, website, SISC, publishing of projected regulations, Law 21/2013, etc.) have been addressed in Article 20.2.7 of this Report, in addition to those specific to the CTS in Article 6.4.

The first article describes the CSN's obligation to provide public access to information on nuclear and radioactive facilities, which therefore covers the management of the radioactive waste generated at all these facilities, including nuclear power plants, other nuclear facilities such as El Cabril, fuel cycle facilities, and installations using radioisotopes in medicine, industry, research and teaching. Likewise, the second article outlines public participation in the prior authorisation process for the CTS.

As regards the provision of a local information committee, this only concerns nuclear power plants and, by extension, the management and storage of the radioactive waste they generate.

13.5 International arrangements

In compliance with Article 37 of the EURATOM Treaty, and as referenced in Article 6.5 of Section G, Spain must provide the Commission with general data relating to any plan for the disposal of radioactive waste which is liable to result in the radioactive contamination of the water, soil or airspace of another Member State.

Spain's experience in compliance with this article on radioactive waste disposal projects is limited to the procedures carried out prior to obtaining the operating permit for the El Cabril facility in 1992, and the report submitted on the dismantling project for the José Cabrera nuclear power plant.

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 a radioactive waste 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 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.

Currently in Spain, LILW management facilities are located either on-site at the nuclear facilities generating the waste or at the El Cabril facility, where disposal is undertaken. The on-site facilities have been assessed and authorised within the licensing process for the facilities generating the waste, as a result of which this article focuses mainly on the El Cabril facility.

14.1 Limitation of possible radiological impacts on individuals, society and the environment

As indicated in Annex B on licensing, the construction permit authorises the licensee to commence construction of a facility and to apply for the operating permit. In the case of new facilities, this authorisation must be submitted to the competent authorities, accompanied by a series of documents. Of particular importance among these is the Preliminary Safety Analysis (PSA). The 2008 revision of the RNRF adds the relevant Autonomous Community authorities to the list of competent authorities, granting them the capacity to make representations on the basis of this documentation.

In accordance with the RNRF (Article 12), the El Cabril disposal facility obtained its construction permit by Ministerial Order on 31 October 1989. The construction of the new supplementary facility for VLLW at El Cabril, which became operational in 2008, was undertaken as a design modification proposal for the existing installation and has been carried out following the same safety criteria.

The general safety objectives defined in the design and construction of the El Cabril facility were as follows:

1. Immediate protection, during the operating phase, and long term protection, during the monitoring and surveillance phase and unrestricted usage phase, for individuals and the environment.
2. Allowing the unrestricted usage of the site within a reasonable time, i.e. allowing the land to be used for any purpose without limitations caused by the disposal facility.

Fulfilment of these objectives is accomplished through the application of the following basic criteria:

- ✓ Isolation of the stored radioactive material from the surroundings (or biosphere) during the operating phase and monitoring and surveillance phase, ensured by the suitability of the site and the elements of the facility.
- ✓ Limitation of the radionuclides present in the disposal packages, so that the radiological impact is acceptable under any foreseeable circumstance and residual activity is compatible with the unrestricted usage of the site.

El Cabril's operating permit in force, including the design modification for the VLLW disposal facility, authorises ENRESA to emplace disposal packages fulfilling the acceptance criteria in its corresponding disposal vaults, without plans for subsequent retrieval, and to close these vaults with final covering layers. Prior to undertaking closure, the covering must be approved by the CSN.

14.2 Technical provisions for the decommissioning of radioactive waste management facilities

In accordance with current legislation, the documentation submitted with the application for a construction permit for any nuclear or radioactive facility must include technological, economic and financing forecasts relating to dismantling and decommissioning. All these aspects are defined in the RNRF, the latest revision of which was drawn up in 2008. This sets out that the CSN has the sole responsibility for defining the scope, content and development of the necessary documentation.

In the specific case of nuclear power plants, the owners are obliged to carry out preparatory activities at the end of the plant's operating life in order for ENRESA to assume ownership and begin the dismantling activities.

14.3 Technical provisions for closure of the El Cabril radioactive waste disposal facility

The amendment of the Regulation on Nuclear and Radioactive Facilities, approved by Royal Decree 1836/1999 of 3 December and further developed by Final Provision 1 of Royal Decree 102/2014, sets out the authorisation for dismantling and closure which enables ENRESA, as the licensee of the disposal facilities for spent nuclear fuel and radioactive waste, to begin the final engineering or other work required to ensure the long term safety of the storage system. It also authorises dismantling activities on determined auxiliary installations, ultimately enabling the delimitation of areas which must be subject to radiological or other types of surveillance and monitoring, as appropriate, during a specific period of time, and the release from control of the remaining areas of the site. The dismantling and closure process is finalised by a statement of closure issued by the Ministry of Industry, Energy and Tourism, subject to report by the Nuclear Safety Council.

The Preliminary Safety Analysis for the El Cabril disposal facility, submitted in order to obtain the construction permit, includes the systems for closure of the facility and those that will operate during the monitoring and surveillance phase.

At the end of the operating phase of the facility, closure activities will be carried out to prepare it for the next phase. It will be necessary to complete the work on disposal and connected elements (coverage, water networks), the disassembly and clearance of the operating facilities (constructions and equipment) no longer required and the installation of all elements required for the monitoring and surveillance phase which are not already in place.

The seepage control network, which will operate with minimum maintenance requirements during the operating phase and monitoring and surveillance phase, is designed to easily identify and locate possible anomalies in any of the disposal vaults. The system's pipework has been installed in accessible underground galleries of reinforced concrete which run longitudinally below the vaults and are designed with sufficient gradient and dimensions to ensure drainage by means of gravity into the final control tank. ENRESA will maintain ownership of the land, thus avoiding any deterioration as a result of uncontrolled human intervention and ensuring the monitoring and maintenance of the covering layers, seepage control network and monitoring devices.

Before initiating the monitoring and surveillance phase, a specific Environmental Radiological Monitoring Programme must be drawn up and submitted for approval by the authorities prior to closure. This Programme will be based on experience acquired, verifications carried out and the resources used during the operating period.

14.4 Technologies used for radioactive waste management

Nuclear power plants

The on-site radioactive waste management facilities at Spanish nuclear power plants were designed and constructed as parts of the plants themselves, in accordance with standards applied at the reference plants, in the United States and Germany. The introduction and development in

Spanish regulations of the concept of the 'reference plant' ensures the incorporation of consolidated and proven technology, without impeding the introduction of innovations.

The El Cabril disposal facility

The conceptual development of the disposal facility was based on the experience acquired in countries with this type of facility and the establishment of basic safety objectives and technical options. As a result of these considerations, the near-surface disposal model was selected, with the adoption of engineered barriers, developing a concept using the French disposal facilities as a reference.

Prior to the startup of the El Cabril LILW disposal facility, and in accordance with the legislation then in force, the facility was subject to a programme of pre-operational verifications that included trials and testing to ensure the correct operation of the different installations and equipment, in relation to nuclear safety and radiological protection and to the applicable industrial and technical regulations. Similarly, the auxiliary installation for VLLW takes operational facilities in other countries as a reference, fundamentally the VLLW facility at Morvilliers, in France. In this case, there has already been operational experience of these technologies in Spain.

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 prior to the construction of low and intermediate level waste management facilities

The low and intermediate level waste management facilities in Spain comprise the on-site treatment plants and storage facilities at the nuclear power plants, the Juzbado fuel assembly manufacturing facility and the CIEMAT nuclear facility. Additionally, there are systems for the treatment, conditioning and storage of waste at the El Cabril disposal facility, which also has licensed installations in place for the disposal of low and intermediate level waste and for very low level waste.

Radioactive facilities, at which ionising radiation applications are developed for medical, industrial and research purposes, also have adequate infrastructures for the temporary storage of the waste they generate, until its delivery to the authorised management company (ENRESA).

Annex B of this Report details the authorisation process for facilities, which includes a systematic safety assessment and an environmental assessment appropriate to the hazard presented by the facility and covering its operating lifetime. The detailed information which can be found in the corresponding section of the Fourth National Report to the Joint Convention is still valid.

15.2 Measures adopted prior to the construction of low and intermediate level radioactive waste disposal facilities

Spain has an operational facility for the disposal of low and intermediate level waste (1992) and another for the disposal of very low level waste (2008), both located at the El Cabril disposal facility. This is classed as a nuclear facility and was thus subject to the system of authorisations and the safety assessments addressed in Section E of this report prior to its construction.

Information relating to the measures adopted prior to the construction of low and intermediate level radioactive waste disposal facilities has remained unchanged and is therefore the same as in previous National Reports to the Joint Convention. This concerns a systematic safety assessment and an environmental assessment for the post-closure period and evaluation of the results on the basis of criteria set out by the regulatory body.

Moreover, Royal Decree 102/2014 of 21 February 2014, on the safe and responsible management of spent nuclear fuel and radioactive waste, amends the RNRF, establishing an authorisation for dismantling and closure and a statement of closure for disposal facilities for radioactive waste, once operation has ceased. These administrative updates authorise the licensee to carry out the final engineering or other work required to ensure the long term safety of the storage system. It also authorises dismantling activities on determined auxiliary installations, enabling the delimitation of areas which must be subject to radiological or other types of surveillance and monitoring, as appropriate, during a specific period of time, and the release from control of the remaining areas of the site.

Royal Decree 102/2014 provides for the regulation, by means of CSN Instructions, of all aspects of safety and protection during the closure of the facility and during the post-closure surveillance and monitoring phase, including the scope and content of the safety demonstrations or analyses at each stage.

15.3 Measures adopted prior to the operation of low and intermediate level radioactive waste management facilities

Information relating to the measures adopted prior to the construction of the installations for waste disposal has remained unchanged and is therefore the same as in previous National Reports to the Joint Convention. The detailed information which can be found in the corresponding section of the Fourth National Report to the Joint Convention also remains valid.

Additionally, Royal Decree 102/2014 of 21 February 2014, on the safe and responsible management of spent nuclear fuel and radioactive waste, has completed the legislative, regulatory and organisational framework in accordance with Council Directive 2011/70/Euratom.

Generally, and in relation to Article 15 of the Joint Convention, Article 12.3 of this Royal Decrees state that during the authorisation process for radioactive waste management facilities, a

Safety Analysis or demonstration is required for the different stages of the facility's life cycle, in accordance with the requirements of the RNRF. It also states the safety demonstration will be commensurate to the complexities of operations and the scale of the associate risks, in accordance with Nuclear Safety Council Instructions, circulars and guides.

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 perating 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

16.1.1 Operating permit, operating procedures and technical support

The RNRF sets out the documentation which must accompany the application for the operating permit, distinguishing between radioactive facilities and nuclear facilities, as described in previous reports and detailed in Annex B.

The licensee is required to submit a series of reports and documentation for the regulatory control of their activities, in accordance with the provisions of the RNRF and the limits and conditions established in the annex to the operating permit. These reports are different for nuclear and radioactive facilities.

The organisation of all nuclear facilities is similar, with an off-site support organisation and the on-site operating personnel performing functions directly relating to activities at the plant. In many cases the support organisation includes sections with responsibilities relating to the management of fuel and radioactive waste.

A programme for the assessment and improvement of safety in relation to organisation and human factors has been included in the framework of the Periodic Safety Reviews associated with the renewal of the operating permits for each nuclear facility.

The CSN performs activities to verify that the processes used by the licensees to maintain the levels of staffing, competences and motivation of in-house and contracted human resources guarantee the maintenance and improvement of the safety of nuclear facilities in all cases.

16.1.2 Waste characterisation and segregation

In Spain, LILW management is based at the El Cabril facility. In accordance with the successive operating permits, ENRESA is authorised to dispose of conditioned LILW in the vaults of the platforms, provided the acceptance criteria established for definitive disposal are met. It is also authorised to carry out the necessary tests and checks for LILW characterisation.

The contracts between ENRESA and each of the waste producers establish the responsibilities of the producers, making a distinction between radioactive and nuclear facilities.

- ✓ In the case of radioactive facilities, the producer is required to:
  - ➪ request the removal of their waste on the basis of the existing agreement (standard contract in force, approved by the Directorate General for Energy Policy and Mines);
  - ➪ optimise waste volumes (segregation at the point of origin);
  - ➪ estimate activity; and
  - ➪ facilitate subsequent management by adapting the way in which the waste is prepared for its projected treatment. This waste will be conditioned at the El Cabril disposal facility.

ENRESA supports these producers in the task of segregation by organising initial and on-going training courses and supplying the packaging for each radioactive waste stream. Before removal, ENRESA carries out specific checks for compliance with the acceptance criteria.

- ✓ In the case of nuclear facilities, the operating and waste management procedures of each facility include waste segregation, treatment and conditioning, and temporary storage activities, in addition to methods for minimising waste production.

The methodology for the acceptance of LILW produced by nuclear facilities is based on the preparation of specific acceptance documentation for each waste package type and producer, including a description of the characteristics and activity of the waste and the waste package production processes. Compliance with the acceptance criteria will be specifically checked by ENRESA. To this end, ENRESA has implemented a system of inspections, production controls and verification tests that guarantees that the waste packages received at the El Cabril disposal facility fulfil the acceptance criteria. This involves applying a quality assurance methodology and criteria previously authorised by the regulatory authorities to the various types of packages generated at nuclear facilities.

In the case of proposals for the production of new waste package streams, ENRESA performs a series of tests and measures prior to conditioning at the nuclear facility's installations, aimed at determining the properties and characteristics of the type of package and the compliance of both with the acceptance criteria in force. Following approval, the resulting production of waste packages will also be subject to production control tests and subsequently to technical verification tests performed in the laboratory at the El Cabril facility.

As stated in the Fourth National Report, as regards VLLW, the major difference with respect to the acceptance criteria for LILW is the introduction of a batch concept known as a 'Disposal Unit', i.e. a VLLW-DU, whose characteristics and origins allow for one specific description, enabling the batch to be processed under a single acceptance procedure. Each VLLW-DU batch has a one-to-one correspondence with a VLLW package batch; they are identical in the event that no further treatment is expected at the El Cabril disposal facility.

In order for a VLLW stream with waste from ongoing long-term production to be accepted, the producer prepares a descriptive declaration of the preparation methods for the waste package, its components and monitoring, included in a document describing the very low level waste package. On the basis of this information, ENRESA draws up a Characterisation Study covering all aspects of the waste stream (nature, classification of toxicity, treatment, method of determining activity, type spectra, scale factors, etc.), allowing the packages to be pre-classified as VLLW.

These two documents will not be required in the case of VLLW streams that have been studied as LILW packages and that have had the corresponding acceptance documents approved.

Once waste packages have been produced, they are analysed in order to assemble an acceptable batch. The main limitations established for the grouping of the packages are as follows:

- ✓ Waste requiring additional treatment at the El Cabril disposal facility may not be included in the same batch as waste not requiring such treatment.
- ✓ Inert, non-hazardous waste cannot be included with hazardous waste. Verification of compliance with the acceptance criteria for VLLW package batches and VLLW-DU batches is accomplished by means of a VLLW batch Acceptance Dossier.

This dossier contains information sufficient for the analysis and justification of compliance with the requirements of the acceptance criteria and other applicable specifications for each package and for the assembled batch. It then documents the checks for compliance with the applicable requirements and limits for the DU batch and for each of the units.

16.1.3 Reporting of incidents

Previous reports stated the requirements of the RNRF with respect to the information which the licensee must submit to the responsible authorities on any event involving a change to the normal operation of the facility or potentially affecting nuclear safety or radiological protection.

Furthermore, Law 33/2007, which reformed both Law 15/1980 creating the Nuclear Safety Council, and the RNRF, also set out that workers at nuclear and radioactive facilities are obliged to report any event that might affect the safe operation of these facilities, protecting them against possible reprisals.

In order to provide guidance to the licensees of nuclear power plants regarding reportable events, in July 2006 the CSN issued Council Instruction IS-10, establishing the criteria for reporting events to the Nuclear Safety Council by the nuclear power plants. This Instruction establishes reporting criteria and lists reportable events, specifying the maximum time for the notification of each to the CSN.

Furthermore, in compliance with the RNRF, nuclear facilities have an On-site Emergency Plan that includes the measures established by the licensee and the assignment of responsibilities for responding to accident conditions. Its objective is to mitigate their consequences, protect the facility's personnel and immediately notify the competent authorities of their occurrence, including an initial assessment of the circumstances and the consequences of the situation.

16.2 Radioactive waste management at El Cabril

16.2.1 Operating permit: limits and conditions. Operating experience

The El Cabril solid radioactive waste disposal facility obtained its first provisional operating permit by Ministerial Order on 9 October 1992. The current operating permit, approved by Ministerial Order on 5 October 2001, will remain valid until the available disposal capacity of the existing vaults is fully utilised. Furthermore, the Resolution issued on 21 July 2008 by the Directorate General for Energy Policy and Mines authorised a design modification for the facility. As a result of this, the disposal vaults now comprise the original 28 vaults for low and intermediate level waste and four vaults for very low level waste. One of these is already operating and the other one is currently in construction.

For the ongoing assessment of the safety of the El Cabril facility, ENRESA carries out Periodic Safety Reviews every ten years. The first of these Reviews was undertaken in December 2003, corresponding to the operational period from 1992 to 2001. The second was undertaken in November 2012, on the subsequent ten-year period, from 2002 to 2011.

The scope and content of the Periodic Safety Review corresponds to the requirements of the Supplementary Technical Instruction to the operating permit and encompasses the following areas:

- ✓ experience relating to the operation of the facility;
- ✓ experience relating to aspects of radiological protection;
- ✓ experience relating to acceptance methodology and quality of waste packages;
- ✓ experience in the study of parameters impacting on the long-term safety of the facility;
- ✓ experience in the long-term safety assessment of the facility;
- ✓ changes to regulations and legislation;
- ✓ assessment and improvement programmes for the facility.

As described in detail in previous reports, the operating permit is granted in accordance with the mandatory updated documents contained in the RNRF in force at the time (Safety Analysis, Operating Specifications, etc.), to which the Disposal Unit acceptance criteria are added. The limits and conditions on nuclear safety and radiological protection establish that operation of the facility must be performed in accordance with the corresponding revision of these documents.

The Operating Specifications describe the general operating conditions for the El Cabril disposal facility. Part of these conditions are the limit values of certain parameters relating to the radiological capacity of the facility, waste characteristics acceptable for incorporation into Disposal Units at the facility, the properties of these units and the conditions imposed on effluent releases during the operating phase. The following are also set out:

1. The actions to be taken in circumstances involving non-compliance with a given limit condition or value.
2. The operating conditions and surveillance requirements (revisions, checks, calibrations, etc.) to which systems, equipment and components significant to safety and radiological protection are subject.

Each of the individual treatment and conditioning activities is described in internal documents known as Operating Instructions. These include all activities within the scope of the particular Instruction, the initial and operating conditions of the system, the operating limits and requirements, actions to be taken in the event of anomalies, alarms and modes of actuation, for each of the facility's systems, both those relating to waste management and the auxiliary systems.

The organisations involved in the design of the facility and in these activities hold regular meetings, where improvement plans are drawn up on the basis of the data obtained from operating experience and maintenance. These activities are regulated in a procedure known as the 'Design modifications procedure', which sets out each of the aspects involved in this process.

16.2.2 Operating, maintenance, monitoring, inspection and testing procedures

The operating permit for the El Cabril disposal facility granted on October 2001 sets out that the MINETUR may demand the implementation of relevant corrective actions in view of the experience acquired from the operation of the facility, the results of other on-going assessments and analyses, and the results of inspections and audits. During 2013, the CSN performed 11 inspections at the El Cabril facility.

Furthermore, both this authorisation and the design modification authorisation referred to above establish the obligation to submit reports to the CSN on the following aspects, among others, during the first quarter of each calendar year: design modifications implemented or in the course of implementation; results of the environmental radiological monitoring programme and personnel dosimetric monitoring; and measures taken to analyse the applicability of new national requirements for nuclear safety and radiological protection, and of relevant regulations produced in countries with disposal facilities of similar design. In this last case, aspects relating to tests and checks which contribute to improving the understanding of the long-term behaviour of radioactive waste are considered relevant.

Amongst the design modifications carried out during the 2010-2013 period, the following may be considered particularly significant:

- ✓ Development of large-scale prototypes of the trial long-term covering layers for the LILW disposal platforms
- ✓ Adaptation of the facility's physical protection plan in line with Royal Decree 1308/2011 on the physical protection of nuclear facilities and materials and radioactive sources
- ✓ Launch of the construction project for Vault 30 for VLLW, which incorporates design and operational improvements gained from the operational experience of Vault 29.

16.2.3 Engineering and technical support services

In accordance with the provisions of the RNRF, the Operating Regulations contain information including a list of posts with nuclear responsibility, and the organisation and functions of the

personnel attached to the facility. It also defines the basic initial and on-going training programmes.

The modifications in this area that have taken place in relation to the Fourth National Report during the period concern the organisational structure for operation, which is based on different organisational units reporting to the facility's Management, whose Director currently reports to ENRESA's Technical Division. This is shown in the organisational chart included in Annex G of this report. In turn, general technical support is provided to the facility from the company's head office via the Safety and Licensing Department and the LILW Engineering Department of the Engineering Division and the Logistics Department of the Operations Division. In addition, the Project Engineering organisation, contracted by the LILW Engineering Department, is generally responsible for the undertaking and review of both the design and the technical validity of modifications, in accordance with the requirements established by the ENRESA Project Manager.

16.2.4 Waste characterisation and segregation

The first operating permit for El Cabril, issued in October 1992, established that the acceptance criteria for waste at the facility should be approved by the regulatory authorities, since they constitute an official operating document. These criteria, with minor modifications introduced over time, remained in force until December 2004 and were applied to primary waste packages.

As stated in the Fourth National Report, in December 2004 the regulatory authorities approved the design modification which permits the use of the CE-2a cask for the management of certain legacy and non-conforming primary waste packages (non-compliance with the quality objectives for mechanical resistance, confinement or resistance to thermal cycles). This has enabled the following:

- ✓ an increase in the activity limit per primary waste package;
- ✓ an increase in the acceptable dose rate limit per primary waste package;
- ✓ optimisation of certain lines of conditioning of packages with walls;

ENRESA has subsequently been authorised to use other types of disposal units, specifically proposed by ENRESA for a more efficient solution to operational issues. These include the authorisation for the manufacturing and use of 'cage' type disposal units for the emplacement in vaults of primary waste packages with unique characteristics in metal structures with a geometry identical to that of the CE-2a cask mentioned above and, more recently, the design and licensing of the CE-2b disposal unit, specifically designed to better satisfy the requirements for the management of solid waste generated during dismantling activities.

ENRESA also currently has an acceptance methodology for primary waste packages from nuclear facilities, compliance with which is part of the Technical Operating Specifications of the El Cabril disposal facility.

The management of waste at the El Cabril facility is designed to enable the identification, monitoring and control of all the waste packages at the facility and to keep the inventory of the amount of activity in the vaults up-to-date, in such a way that it may be compared at any time with the maximum radiological capacity (reference inventory).

ENRESA is authorised to carry out the necessary tests and checks for LILW characterisation and acceptance. The acceptance process controls are mainly process audits, production controls and destructive and non-destructive technical verification tests, mostly performed in the laboratory at the El Cabril disposal facility. The objectives of these tests are as follows:

- ✓ Checking activity values against those declared by the producer and tracking of scale factors for difficult to measure radionuclides.

- ✓ Compliance with the waste package properties associated with the production methodology.
- ✓ Checking chemical aspects of significance to safety in disposal (compatibility with the container, corrosion, etc.).
- ✓ Compliance with the quality-related objectives of the conditioned waste.

Since October 2008, ENRESA has had a specific installation for the disposal of VLLW in operation at the El Cabril facility. As has been stated previously, this waste constitutes a sub-category of low and intermediate level waste. In general, specific activities range between 1 and 100 Bequerels per gram, but may reach several thousand in the case of certain radionuclides of low radiotoxicity or of minor quantities.

16.2.5 Reporting of incidents

The El Cabril facility has an On-site Emergency Plan. Emergency situations are classified in three categories, none of which include the release of radioactive materials in such quantity that it is necessary to adopt off-site protective measures. Consequently, no level of emergency of severity higher than the Site Emergency is defined.

In addition to the organisational structure for normal conditions, the On-site Emergency Plan includes the activities and organisational structure for the operation of the facility in emergency situations requiring actions above and beyond normal site activities. The basis of emergency organisation is the operating organisation itself, with mechanisms in place to guarantee the location of one of these persons at all times, in accordance with an internal procedure. Reporting to the CSN is required in all cases.

Furthermore, El Cabril, like all other nuclear facilities, is subject to the reporting of events in accordance with the legislation in force.

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.

In accordance with Article 4.4 of Royal Decree 102/2014 of 21 February, on the safe and responsible management of spent nuclear fuel and radioactive waste, the State assumes ownership of spent fuel and radioactive waste once its disposal has been undertaken. Likewise, the State is responsible for monitoring the disposal facilities subsequent to their closure.

Similarly, in accordance with the provisions of Article 38a of Law 25/1964, the Nuclear Energy Act (NEA) of 25 April, the management of radioactive waste, including spent nuclear fuel, is assigned to the Spanish radioactive waste management agency ENRESA, who will carry out this public service in accordance with the General Radioactive Waste Plan approved by the Government.

17.1 Safekeeping of documents

In accordance with Royal Decree 102/2014, as licensee of the facilities, ENRESA is responsible for the ongoing maintenance of an archive of the waste inventory of disposal and storage facilities for radioactive waste. Article 9.3e specifies that amongst ENRESA's assigned functions is the production and management of the National Inventory of Spent Fuel and Radioactive Waste. This Inventory will continue to list spent nuclear fuel and radioactive waste definitively disposed of, after the closure of the facility where they are deposited.

17.2 Closure of definitive disposal facilities for radioactive waste

Royal Decree 102/2014 amends Royal Decree 1836/1999 on the regulation of nuclear and radioactive facilities, adding to Article 12 the requirement for definitive disposal facilities for spent fuel and radioactive waste to have an authorisation for dismantling and closure (Article 12g).

The dismantling and closure process for definitive disposal facilities will end with a statement of closure, enabling the delimitation of areas which must be subject to radiological or other types of surveillance and monitoring, as appropriate, during a specific period of time, and the release from control of the remaining areas of the site.

In Spain, all the facilities that have undertaken the on-site stabilisation and conditioning of their waste repositories belong to the front end of the nuclear fuel cycle (mining tailings and process tailings from former uranium mills). The current status of these facilities is unchanged since the Fourth National Report.

17.3 Institutional controls and future projections

In accordance with the recent Royal Decree 102/2014, the dismantling and closure procedure for the definitive disposal of spent nuclear fuel and radioactive waste ends with a statement of closure. This statement must delimit the areas which, subsequent to closure, will be subject to radiological or other types of surveillance and monitoring, and the specific period of time for this monitoring.

Similarly, once approved, the future 7th General Radioactive Waste Plan must include, in accordance with this Royal Decree, concepts or plans for the post-closure period of a disposal facility's lifetime, including the estimated period during which appropriate controls are retained and the means to be employed to preserve knowledge of that facility in the long term.

17.4 Provisions for potential remedial interventions

The potential remedial interventions at definitive disposal facilities for spent nuclear fuel and radioactive waste must be set out in the statements of closure which are issued. For the reasons set

out above, it is to be expected that the practical implementation of such remedial measures or actions will be assigned in the statements of closure to those entities or organisations appointed as responsible for the long-term monitoring of these facilities.

Section I

Transboundary movement

Section I. Transboundary movement

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 Legislative development

As has already been described in previous National Reports, Council Directive 2006/117/Euratom of 20 November 2006 established the Community system for the supervision and control of transboundary shipments of radioactive waste and spent fuel. This Directive was transposed into the internal legal system by means of Royal Decree 243/2009 of 27 February, regulating the supervision and control of shipments of radioactive waste and spent fuel between Member States and into or out of the Community.

Likewise, the Royal Decree establishes the standard document format defined in Commission Decision 2008/312/Euratom of 5 March, which must be completed in the case of an application for shipment.

Royal Decree 243/2009 is not applicable in the following cases: shipments of disused sources to a supplier or manufacturer of radioactive sources or to a recognised installation; shipments of radioactive materials recovered through reprocessing for further use; transboundary shipments of waste that contains only naturally occurring radioactive material which does not arise from practical applications. This is in accordance with the definition provided by Royal Decree 783/2001 of 6 July.

The authorisations set out in this Royal Decree do not replace any of the specific national requirements applicable to these shipments, such as those relating to specific authorisations for transport, physical protection, civil defence, etc.

In addition, Royal Decree 102/2014 sets out that radioactive waste generated in Spain shall be disposed of in Spain, unless at the time of shipment an agreement, taking into account the criteria established by the Commission in accordance with section 2, Article 16 of Directive 2006/117/Euratom, has entered into force between the Spanish State and another Member State or a third country to use a disposal facility in one of them. This requirement is not applicable to the return of disused sealed sources which are shipped to a supplier or manufacturer, nor to the shipment of spent fuel from research reactors to a country which supplies or manufactures research reactor fuel, taking the relevant international agreements into account.

In the case of shipments of radioactive waste for disposal in a country which is not a Member State of the European Union, before shipping, the legal or natural person responsible for the waste must notify the Directorate General for Energy Policy and Mines of the MINETUR, so that they may inform the European Commission of the content of the relevant agreement and take measures to ensure that:

a) the State of destination has an agreement in force with the European Atomic Energy Community which covers the management of spent fuel and radioactive waste or is part of the Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management;

b) the State of destination has programmes for radioactive waste management and disposal, whose objectives ensure a high level of safety and are equivalent to those set out in Directive 2011/70/Euratom, establishing a Community framework for the responsible and safe management of spent fuel and radioactive waste;

c) the State of destination's disposal facility has been authorised to receive the shipment of radioactive waste, is operational before the time of shipping and is managed in accordance with the requirements of the State of destination's programme of radioactive waste management and disposal.

Furthermore, as stated in previous reports, Spain has incorporated in its internal legislation a series of international updates and amendments concerning the transport of dangerous goods by air, sea, rail and road, with specific reference to the following:

- ✓ the European Agreement concerning the International Carriage of Dangerous Goods by Road (ADR) 2013 (published in the Official State Gazette of 14 March 2013 and corrections in that of 28 May 2013). ADR 2011 entered into force on 30 June 2011. Since 1 January 2013, a new version has been in force (ADR 2013), although until 30 June 2013, shipments will also be allowed in accordance with ADR 2011.
- ✓ the Regulations concerning the International Carriage of Dangerous Goods by Rail (RID) 2013. The amendments introduced in this version of the RID were published in the Official State Gazette on 16 April 2013.
- ✓ the International Maritime Dangerous Goods (IMDG) Code 2010, published in the Official State Gazette on 10 August 2013.
- ✓ the Technical Instructions for the Safe Transport of Dangerous Goods by Air (ICAO), approved by means of RD 1749/1984 of 1 August and amended by Order FOM/3553/2011 of 5 December.

In addition, Royal Decree 97/2014 of 14 February, regulating the transport of dangerous goods by road within Spanish territory, repeals Royal Decree 551/2006 of 5 May 2006, regulating the transport of dangerous goods by road within Spanish territory.

27.2 Spanish experience

In 2013, a shipment of various metal pieces from the reactor internals from the José Cabrera nuclear power plant was sent to the Studsvik facilities (Sweden) for the performance of various tests on the behaviour of metal subjected to high levels of radiation.

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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, remanufacturing or disposal of disused sealed sources takes place in a safe manner.*
2. *A Contracting Party shall allow for reentry 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, remanufacture or disposal

Article 31 of Law 25/1964, the Nuclear Energy Act (NEA), stipulates that radioactive materials may not be used or stored within Spanish national territory by persons not expressly authorised to do so, and states that the same requirements must be met for transfer or resale.

This legal requirement is developed in the Regulation on Nuclear and Radioactive Facilities[1] (RINR). Article 36 of the Regulation sets out that radioactive facilities with scientific, medical, agricultural, commercial or industrial purposes require an operating permit, a statement of decommissioning and, where relevant, an authorisation for modification and for change of ownership.

Article 34 of the Regulation defines radioactive facilities as including facilities of any type which hold a source of ionising radiation, and premises, laboratories, factories and installations at which radioactive materials are produced, used, possessed, treated, handled or stored. Article 35 of the RINR states that facilities meeting certain conditions described in the Regulation shall not be considered radioactive facilities. These conditions include those which define levels of exemption based on isotopic activity and isotopic activity per unit of mass.

Likewise, the RINR establishes conditions for exemption from classification as radioactive installation applicable to certain devices (consumer goods) incorporating radioactive substances

[1] *Approved by Royal Decree 1836/1999 of 3 December and amended by Royal Decree 35/2008 of 18 January, Royal Decree 1308/2011 of 26 September and Royal Decree 102/2014 of 21 February.*

or generating ionising radiation. In this regard, the Regulation sets out a system for the approval of types of radioactive device by the Ministry of Industry, Energy and Tourism, subsequent to a report by the Nuclear Safety Council (CSN), in which the conditions for disposal are set out.

These requirements are applicable regardless of whether the radioactive sources or materials are new or depleted or disused.

Consequently in Spain, an administrative authorisation must be obtained for the possession or remanufacture of any radioactive source or material. As part of the licensing process for this authorisation, the CSN must verify that the licensee will perform all operations in compliance with the applicable regulations and requirements for safety and radiological protection, before issuing the mandatory report on safety and radiological protection. The corresponding authorisations issued by the competent authorities are accompanied by applicable limits and conditions relating to safety and radiological protection.

Amongst the documentation to be submitted by the licensee in order to obtain these authorisations is a document on provisions for the decommissioning of the facility. This must provide information on provisions for the safe management of disused sources, including the economic coverage for this purpose.

Whenever the Spanish Regulatory Body encounters disused radioactive sources or equipment in the course of its inspections and monitoring of authorised facilities, it calls for the licensees to have such sources or equipment removed via the channels set out in the regulations. It also supervises the performance of these activities.

As regards the disposal of disused radioactive sources, the provisions in place in Spain are diverse and depend on the different situations that might arise.

When the licensee has obtained radioactive sources under the authorisation for a radioactive facility, entitling them to hold and use such items in accordance with the safety and radiological protection limits and conditions accompanying this authorisation, the licensee is obliged to return the disused radioactive sources to the supplier. Failing this, they must be managed by the Spanish radioactive waste management agency ENRESA.

In Spain there are no facilities for the manufacture or production of sealed radioactive sources. Consequently, all sources are imported from other countries. Article 74 of the RINR states that imports, exports and intra-community shipments of radioactive materials must be carried out in compliance with the international commitments made by Spain in this respect. When sources come from a European Union Member State, a system of documentation is applicable for notification of shipments of sources to the authorities of the receiving country and their receipt, as established in Regulation 1493/1993/Euratom. For sources with origins or destinations in countries outside the European Union, the Code of Conduct on the Safety and Security of Radioactive Sources is applicable, and more specifically the supplementary Guidance on the Import and Export of Radioactive Sources. This guide sets out a system by which prior consent must be obtained from the importing country's Regulatory Authority for the shipment of any Category 1 source, along with notification prior to the date of dispatch. For Category 2 sources, only notification prior to the date of dispatch is required. In Spain, the Nuclear Safety Council has been designated the point of contact for communications deriving from the implementation of this guide.

When the entity undertaking the importation of radioactive sources is authorised as a radioactive facility, this activity is already encompassed in the authorisation (single authorisation). Nuclear Safety Council Instruction IS-28 of 22 September 2010, on the technical specifications that must be observed by 2nd and 3rd category radioactive facilities, sets out the obligation for all entities importing radioactive sources from other countries to draw up agreements with the suppliers for the return of these sources to the country of origin at the end of their useful life. Specifi-

cally, IS-28 sets out that all radioactive facilities must establish agreements with the supplier of each radioactive source for its return when it is in disuse.

There are situations in which the holder of an authorisation for the possession and use of radioactive sources cannot return them to the supplier at the end of their useful life (for example because the supplier is no longer in business). In these cases the limits and conditions of the authorisations establish that the licensee should contact ENRESA to undertake their removal and management as radioactive waste. On the basis of the legislation governing its activity, ENRESA is responsible for managing the radioactive sources and for providing a final destination for them in accordance with the applicable regulations, depositing them at the authorised low and intermediate level waste disposal facility in Sierra Albarrana (El Cabril) or taking appropriate measures for their final management.

In the case of disused radioactive sources outside the regulatory control system (old or orphan sources), i.e. when there is no authorised holder, the two options above are also applicable. If it possible to identify the supplier of the source, the holder makes the necessary arrangements for it to be removed; if this is not feasible, the holder contacts ENRESA. In accordance with Article 74 of the RINR, ENRESA's removal of unauthorised disused sources requires a specific transfer authorisation issued by the Ministry of Economy, subsequent to a report by the CSN.

A special case within the category of orphan sources is that of sources detected at scrap metal processing or recovery facilities. Actions for ensuring the safe management of these sources are set out in a Protocol endorsed by the companies in this sector, the Ministry of Industry, Energy and Tourism, the CSN, ENRESA and the trade unions. This protocol establishes that the owner of the facility in which the source is detected is obliged to set up technical and administrative systems to isolate the source, identify the radioactive isotope and its activity, and keep it under safe conditions pending removal. The protocol also establishes that when the radioactive source is of national origin it will be managed as radioactive waste by ENRESA, who will cover the costs. In all other cases, the sources must be returned to the supplier of the scrap or, if this is not feasible, it must be transferred to ENRESA for management as radioactive waste. In this case, the cost is charged to the companies, without prejudice to the charge being passed along to the supplier of the scrap or the shipping agent.

Another special case is that of ^{226}Ra needles for medical use that were used in Spain before the implementation of legislation regulating authorisations for the possession and use of radioactive sources and materials. These sources have not been used for many years and have been the subject of specific campaigns for recovery, removal and management by ENRESA. The costs of this management have been charged to the ENRESA fund, with no cost to the holders. Currently, the collection and removal campaign for these sources is considered at an end, following several years with no new occurrence.

The safe possession, use, transport and disposal of radioactive sources in all cases addressed in the previous paragraphs is ensured by means of the fact that the various entities involved in these processes are obliged to fulfil the requirements of the Regulation on Protection of Health against Ionising Radiation. This Spanish regulation includes requirements on safety and radiological protection equivalent to those contained in the Radiation Protection and Safety of Radiation Sources: International Basic Safety Standards of the International Atomic Energy Agency (IAEA) and in European Union Directive 96/29/Euratom.

In December 2003, the Council of the European Union approved Directive 122/2003/Euratom on the control of high-activity sealed radioactive sources and orphan sources. This directive has been transposed into Spanish national legislation by means of Royal Decree 229/2006 of 24 February on the control of high activity sealed sources and orphan sources. This new regulation includes specific requirements regarding the control of sources and the management of disused sources.

Article 5 states that, before completing the procedure for prior authorisation for the startup of a radioactive facility whose authorisation includes a source, the holders of the source should establish appropriate agreements with the supplier for the return of the source when it becomes a disused source. A financial guarantee must be established to ensure safe management at that time, to cover the possibility of insolvency, suspension of business or any other contingency which could affect the holder of such sources.

Article 7 of this regulation establishes that holders of sources must keep a record sheet for each of the sources for which they are responsible, detailing location and transfers, and send copies to the Nuclear Safety Council and the Ministry of Industry, Tourism and Trade. They are also required to provide a copy of this record in the specific event of any change in location or, if relevant, in the usual storage of the source. On closure of the record of a source, they must immediately provide information identifying the new holder or the recognised facility to which the source is transferred.

As an additional measure this article requires the Nuclear Safety Council to maintain an up-to-date national inventory of authorised holders and the sources they hold.

Article 8 of this regulation requires the holder to return each disused source to the supplier, in accordance with the appropriate prior agreements, or transfer it to another authorised holder or place it in a recognised installation, without undue delay after termination of use.

Finally, this regulation includes requirements relating to the identification and marking of sources, personnel training, and measures for detecting the presence of orphan sources and for their subsequent management, including the establishment of a financial guarantee to cover the costs involved.

In April 2004, Spain informed the Director General of the IAEA of its commitment to applying the Code of Conduct on the Safety and Security of Radioactive Sources. This involves the reinforcement of measures for maintaining effective control over radioactive sources applicable from the stage of initial production to their final disposal at an authorised facility. These measures are included in the national legislation on safety, radiological protection, radioactive waste management, and transport and control of radioactive sources.

As stated above, Spain is also applying the supplementary Guidance on the Import and Export of Radioactive Sources, published by the IAEA in development of the Code of Conduct, and has appointed a national point of contact for the exchange of requests for consent for shipments of sources and notifications of shipments.

A final point of interest is the approval of Royal Decree 1308/2011 of 26 September, on the physical protection of facilities, nuclear materials and radioactive sources. This Royal Decree aims to establish a physical protection system including: a) protection from theft, robbery of other illicit appropriation of nuclear materials and radioactive sources during their usage, storage and transport; b) implementation of adequate measures to locate and, as appropriate, recover stolen nuclear material or radioactive sources; c) protection against sabotage or any other illegal action which might lead to radiological consequences or damage or alter the normal operation of facilities; and d) mitigation of the radiological consequences of sabotage.

With regard to radioactive sources, this Royal Decree sets out a classification system, based on activity and hazard thresholds of a range of radionuclides. For those which fall within a certain category, a series of requirements is imposed which fundamentally involves the obligation for holders to obtain an authorisation issued by the Ministry of Industry, Energy and Tourism, subject to approvals from both the Nuclear Safety Council and the Ministry of the Interior. This authorisation is based on the verification that the applicant has an adequate physical safety system in place, including material resources, operational organisation and protocols, and safekeeping of radioactive materials.

28.2 Reentry into Spanish territory of disused sealed sources

As stated above, there are currently no facilities in Spain for the manufacture or production of sealed radioactive sources. Nevertheless, there is no provision in Spanish legislation that prevents the reentry of radioactive sources exported by Spanish manufacturers.

The authorisation for Spanish licensees to import sealed radioactive sources from other countries requires that these licensees adhere to the provisions of this article, including the return of disused sources to authorised suppliers or manufacturers in their national territory.

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Section K

Overall efforts to improve safety

Section K. Overall efforts to improve safety

K1. Measures relating to challenges and suggestions identified at the Fourth Review Meeting of the Joint Convention

During the period covered by this Report, Spain has continued to work on the challenges and suggestions identified at the Fourth Review Meeting of the Convention (developments to ensure timely provision of additional storage capacity for spent fuel in the pools at the nuclear power plants where saturation is predicted; the long term management of long lived disused sealed sources; dismantling activities at the Saelices el Chico uranium milling facilities in Salamanca; and the analysis of loss of large areas as a consequence of explosions or fire, particularly for nuclear power plants in the process of dismantling) as outlined in Section A.3.

K2. Potential areas for improvement and activities planned for improving safety

The Fifth National Report has described the situation in Spain in relation to the management of spent fuel and radioactive waste within the context of the requirements set out in the Joint Convention. In view of the information provided to address each article and the assessment of compliance, it may be stated that in general the Spanish system continues to fulfil the requirements of the Convention.

Nevertheless, taking into account the very nature of the safe management of radioactive waste and spent fuel, work is ongoing on improvements to the legal and regulatory framework and the areas indicated below, in which improvements are expected in the short and medium term.

K2.1 Legal developments in relation to safety in the management of spent fuel and radioactive waste

As has been stated throughout this Report, the areas in which efforts will continue in order to complete the legal and regulatory framework for the long-term management of spent fuel and radioactive waste are as follows:

Transposition into the national legal system 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, within the deadline allowed by the Directive (6 February 2018).

Within the European Community, work will continue on the amendments to Council Directive 2009/71/Euratom of 25 June 2009, establishing a Community framework for the nuclear safety of nuclear installations. Once approved, work will commence on its transposition into the Spanish legal system.

K2.2 Licensing and construction of a Centralised Temporary Storage (CTS) facility

On 30 December 2011, the Council of Ministers designated Villar de Cañas (Cuenca) as the chosen municipality for the site of the Centralised Temporary Storage facility and its associated Technological Centre. This decision was published in the Resolution of the Secretariat of State for Energy of 18 January 2012 and in the Official State Gazette of 20 January 2012. This Resolution also sets out that the CTS project and its associated Technology Centre will provide an essential public service which the State assigns to ENRESA.

During 2012 the preliminary study on the land was carried out, followed by selection, acquisition, and detailed characterisation. Subsequently in 2013, the site characterisation, principal engineering contracting and production of official documentation for the application for authorisations were carried out.

As already stated in Article 6.1 of this Report, in January 2014, ENRESA simultaneously submitted to the Ministry of Industry, Energy and Tourism (MINETUR) the applications for the prior or siting authorisation and the construction permit, required by the Regulation on Nuclear and Radioactive Facilities, approved by Royal Decree 1836/1999 of 3 December. The prior authorisation, which is an official recognition of the purpose of the facility and the suitability of the chosen site, will empower ENRESA to begin work on authorised preliminary infrastructures. The construction permit will enable construction of the nuclear facilities to begin. Both require the mandatory and binding report from the Nuclear Safety Council (CSN), which has already been requested.

Likewise, in August 2013, the Environmental Impact Assessment was begun on the CTS project, required by Royal Legislative Decree 1/2008 of 11 January (in force at that time and now repealed by Law 21/2013 on environmental assessment) since the facility is designed 'solely for the storage (planned for more than 10 years) of irradiated nuclear fuels or radioactive waste in a different site than the production site'. Both the prior authorisation and the Environmental Impact Assessment are subject to public information procedures, which will be carried out simultaneously, in accordance with regulations.

Subsequently, in order to enable the startup of operation of the facility, projected for the beginning of 2018, the Regulation on Nuclear and Radioactive Facilities requires an operating permit. This is granted by the MINETUR, subject to the CSN's mandatory and binding report, and is provisional until the completion of the nuclear tests and the analysis of their results by the CSN. Nevertheless, the startup of the Cask Holding Facility is projected for the end of 2016, to meet the need for interim storage of spent fuel and waste until the main facility becomes operational.

Besides the authorisations mentioned, the project also requires other permits and licenses to be awarded by different bodies and authorities, such as planning permission from the municipality of Villar de Cañas.

K2.3 Approval of the 7TH General Radioactive Waste Plan (GRWP)

The 6th GRWP currently in force already includes strategies and actions to be carried out in Spain in the various areas of radioactive waste management and dismantling of facilities, as well as the corresponding economic and financial provisions to be made. Nevertheless, the need to update these provisions and the activities relating to the CTS, and to adapt them to the requirements of the new Directive 2011/70/Euratom entail the Government's implementation of a 7th Plan. The proposal for this plan has already been submitted by ENRESA to the Ministry of Industry, Energy and Tourism.

The legislative framework governing the GRWP has been affected by the adoption of Directive 2011/70/Euratom, establishing a Community framework for the responsible and safe management of spent fuel and radioactive waste, and its transposition into the national legal system by means of Royal Decree 102/2014 on the responsible and safe management of spent fuel and radioactive waste.

This Directive requires Member States to establish a national programme for implementation of the policy for the management of spent fuel and radioactive waste. This must be regularly reviewed and updated, and must include the minimum content set out in Article 12. The European Commission must be notified of the content of the national programme for the first time before 23 August 2015. From then, only the most significant changes need to be reported.

Although the Spanish legislative framework already required the establishment of a national programme long before the entry into force of the new Directive (the 1st GRWP dates from 1987), the adoption of the 7th GRWP will be carried out in accordance with this new Community framework, adapted to its requirements and encompassing aspects not covered by the 6th GRWP. These include concepts and plans for the period after the useful life of the facilities, and transparency policies and processes.

The draft of the 7th Plan will be subject, in accordance with the new Law 21/2013 on environmental assessment, to the strategic environmental assessment procedure, which includes a consultation process with the various Public Administrations, Bodies and interested parties and a process of public scrutiny.

In accordance with the NEA, this Plan will be approved by the Government, at the proposal of the Ministry of Industry, Energy and Tourism, subject to the Nuclear Safety Council report and comments from the Autonomous Communities on matters of land usage and the environment.

K2.4 Actions related to the post-Fukushima National Action Plan (NAcP)

The review of the National Action Plan (NAcP) post-Fukushima is planned for the end of 2014. An ENSREG seminar will be held in April 2015, which will conclude a complete peer review process on the state of progress and revisions of the Member States' NAcPs. Also related to post-Fukushima actions and within the framework of the Western European Nuclear Regulators Association (WENRA), work has continued on the revision of the Safety Reference Levels (SRLs) for operational nuclear reactors in light of the lessons learned from the Fukushima accident. The legislative incorporation of the revised SRLs and their implementation at facilities will be developed and carried out from 2014. Within the framework of the Convention on Nuclear Safety, one of the challenges identified for Spain is the review of seismic characterisation of Spanish nuclear power plant sites, in accordance with the most advanced international standards.

K2.5 Safety culture in the Regulatory Body

In view of the outcomes of the IRRS missions at international level, note has been taken of the repeated recommendation for the express inclusion of safety culture in the regulator's integrated management system. The CSN will work on the reinforcement of the effective implementation of safety culture throughout the organisation, in line with the most recent international reports.

K2.6 Review of guidelines, plans and procedures for nuclear emergencies

As part of the actions deriving from lessons learned from Fukushima, the Basic Nuclear Emergency Plan will be revised, at national level. The modification of the guidance document will entail the revision of the On-site and Off-site Emergency Plans for Spanish nuclear facilities. Additionally, the CSN will review the procedures and instructions included in the CSN's Emergency Response Organisation (ERO).

K3. Description of the outcomes of the peer review missions and follow-up missions, and measures taken by Spain to enable public access to the resulting reports

During the period covered by this Report, in February 2011, Spain hosted a follow-up mission to the IRRS (Integrated Regulatory Review Service) mission carried out by the International Atomic Energy Agency (IAEA) in Spain in 2008. There was also a peer review process of post-Fukushima National Action Plans within the European Union. Both are described in Annex D. The results of both review missions are available to the public via the CSN website[1,2].

K4. Information on the improvement of openness and transparency in the implementation of the requirements of the Convention

With the aim of achieving greater transparency and public access to information regarding the implementation of the requirements of the Joint Convention, the Ministry of Industry, Energy and Tourism has published on its website[3] all National Reports drawn up in accordance with Article 32 of the Convention, as well as the queries and comments received during the revision

[1] http://www.csn.es/images/stories/actualidad_datos/noticias/follow_up_informe_final_ingls_2011.pdf

[2] http://www.ensreg.eu/sites/default/files/HLG_p%282013-24%29_120%20Final%20NAcP%20Workshop%20Summary%20Report.pdf

[3] http://www.minetur.gob.es/energia/nuclear/Residuos/GestionResiduos/Convencion/Paginas/convencionconjunta.aspx

processes. The National Report is accessible to the public via both the CSN and IAEA websites. Likewise, the National Report, the reports by the Rapporteurs to the Plenary and the Summary Report of the Review Meetings are submitted to the respective Congressional and Senate Commissions on Industry, Energy and Tourism.

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Section L

Annexes

Section L. Annexes

Annex A

National legal and regulatory framework for nuclear energy and radioactive waste

1. Legislative provisions

- ✓ Nuclear Energy Act (Law 25/1964 of 29 April; NEA; Official State Gazette 04/05/1964), amended by the following:
  - ➪ Law 25/1968 of 20 June, amending Articles 9 and 16 of Law 25/1964
  - ➪ Law 15/1980 of 22 April, creating the Nuclear Safety Council
  - ➪ Law 54/1997, the Electricity Industry Act of 27 November (Article 2.9)
  - ➪ Law 62/2003 of 30 December, on fiscal, administrative and social order measures (addition of Article 2.12bis and Additional Provision 1)
  - ➪ 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, 44bis and Chapter XIV)
  - ➪ Law 11/2009 of 26 October, regulating Public Limited Companies quoted on the Property Market (Article 38bis)
  - ➪ Law 12/2011 of 27 May, on civil liability for nuclear damage or damage caused by radioactive materials (Articles 2 and 28) (will repeal Chapter VII (except Article 45) and Chapters VIII, IX and X once it enters into force).
- ✓ Law creating the Nuclear Safety Council (Law 15/1980 of 22 April; Official State Gazette 25/04/1980), amended by the following:
  - ➪ Law 34/1998 of 7 October, the Hydrocarbon Sector Act
  - ➪ Law 14/1999 of 4 May, on tariffs and fees 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, on reforms to promote productivity
  - ➪ Law 33/2007 of 7 November, reforming Law 15/1980
- ✓ Law on tariffs and fees for services rendered by the Nuclear Safety Council (Law 14/1999 of 4 May; Official State Gazette 05/05/1999, amended by the following:
  - ➪ Law 30/2005 of 29 December, on General State Budgets for 2006 (Official State Gazette 30/12/2005)
- ✓ Electricity Industry Act (Law 54/1997 of 27 November; Official State Gazette 28/11/1997 and 31/12/2001), amended with reference to nuclear energy by the following:
  - ➪ Law 24/2005 of 18 November, on reforms to promote productivity (Additional Provision 7)

- Law 11/2009 of 26 October, regulating Public Limited Companies quoted on the Property Market (Additional Provision 6 and repeal of Additional Provision 6bis)
- Law 2/2011 of 4 March, the Sustainable Economy Act, which amends Additional Provision 6, Section 9.4 of Law 54/1997, regulating the fee for the rendering of services for the management of radioactive waste generated by radioactive facilities and other installations
- Law 24/2013 of 26 December, on the Electrical Energy Sector, which repeals Law 54/1997, except Additional Provisions 6 and 7 (Official State Gazette 27/12/2013)

✓ Law 21/2013 of 9 December, on environmental assessment (Official State Gazette 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 environmental matters (Official State Gazette 19/07/2006), amended by the following:

- Royal Legislative Decree 1/2008 of 11 January, approving the revised text of the Law on environmental impact assessment of projects

✓ Law 12/2006 of 27 December, on the supplementary tax system for the Budget of the Autonomous Community of Andalusia (Official State Gazette 16/01/2007)

✓ Law 12/2011 of 27 May, on civil liability for nuclear damage or damage caused by radioactive materials (Official State Gazette 28/05/2011), not yet in force

✓ Law 15/2012 of 27 December, on fiscal measures for sustainable energy (Official State Gazette 28/12/2012), amended by:

- Law 16/2013 of 29 October, establishing certain measures for environmental taxation and adopting other financial and tax measures (Official State Gazette 30/10/2013)

2. Regulatory provisions

1. Regulation on Nuclear and Radioactive Facilities (Royal Decree 1836/1999 of 3 December; Official State Gazette 31/12/1999) This regulation was amended by the following:
   - Royal Decree 35/2008 of 18 January, modifying the Regulation on Nuclear and Radioactive Facilities
   - Royal Decree 1308/2011 of 26 September, on the physical protection of nuclear facilities and materials and radioactive sources (Official State Gazette 07/10/2011)
   - Royal Decree 102/2014 of 21 February, on the safe and responsible management of spent nuclear fuel and radioactive waste
2. Regulation on the Protection of Health against Ionising Radiation (Royal Decree 783/2001 of 6 July; Official State Gazette 26/06/2001), amended by the following:
   - Royal Decree 1439/2010 of 5 November, modifying the Regulation on the Protection of Health against Ionising Radiation, approved by Royal Decree 783/2001 of 6 July (Official State Gazette 18/11/2010)

3. Royal Decree 102/2014 of 21 February, on the safe and responsible management of spent nuclear fuel and radioactive waste (Official State Gazette 08/03/2014)
4. Royal Decree 1440/2010 of 5 November, approving the Nuclear Safety Council Statute (Official State Gazette 22/11/2010)
5. Royal Decree 229/2006 of 24 February, on the control of high level sealed sources and orphan sources (Official State Gazette 28/02/2006, amended by the following:
   - Royal Decree 1308/2011 of 26 September, on the physical protection of nuclear facilities and materials and radioactive sources (Official State Gazette 07/10/2011)
6. Royal Decree 775/2006 of 23 June, creating the Interministerial Commission for the establishment of siting criteria for the centralised temporary storage facility for spent nuclear fuel and high level waste and the associated technology centre (Official State Gazette 05/07/2006)
7. Royal Decree 413/1997 of 21 March, on the radiological protection of external workers at risk of exposure to ionising radiation due to activities in the controlled area (Official State Gazette 16/04/1997)
8. Royal Decree 1132/1990 of 14 September, laying down basic measures for the radiation protection of persons undergoing medical examination or treatment (Official State Gazette 18/09/1990), amended by the following:
   - Royal Decree 220/1997 of 14 February, regulating the academic qualifications of specialists in medical radiological physics (Official State Gazette 01/03/1997)
   - Royal Decree 1976/1999 of 23 December, establishing quality criteria for diagnostic radiology (Official State Gazette 29/12/1999)
9. Royal Decree 815/2001 of 13 July, on justification of the use of ionising radiation for the radiological protection of persons in the event of medical exposure (Official State Gazette 14/07/2001)
10. Royal Decree 1085/2009 of 3 July, approving the Regulation on the installation and use of X-ray apparatus for the purpose of medical diagnosis (Official State Gazette 18/07/2009)
11. Royal Decree 1308/2011 of 26 September, on the physical protection of nuclear facilities and materials and radioactive sources (Official State Gazette 07/10/2011)
12. Royal Decree 1464/1999 of 17 September, on activities related to the front end of the nuclear fuel cycle (Official State Gazette 05/10/1999)
13. Royal Decree 1546/2004 of 25 June, approving the Basic Nuclear Emergency Plan (PLABEN), (Official State Gazette 14/07/2004), amended by the following:
   - Royal Decree 1428/2009 of 11 September (Official State Gazette 12/09/2009)
   - Royal Decree 1276/2011 of 16 September (Official State Gazette 17/09/2011)
14. Regulation on nuclear risk coverage (Decree 2177/1967 of 22 July; Official State Gazette 18/09/1967), amended by the following:
   - Decree 742/1968 of 28 March, modifying Article 66 of the Regulation and will be partially repealed when the following enters into force:

- Law 12/2011 of 27 May, on civil liability for nuclear damage or damage caused by radioactive materials (Official State Gazette 28/05/2011)

15. Royal Decree 208/2005 of 25 February, on electrical and electronic devices and waste management (Official State Gazette 26/02/2005), amended by:
    - Royal Decree 219/2013 of 22 March, on restrictions on the use of certain dangerous substances in electrical and electronic devices (Official State Gazette 23/03/2013)
16. Royal Decree 1428/1986 of 13 June, on radioactive lightning rods (Official State Gazette 11/07/1986), amended by the following:
    - Royal Decree 903/1987 of 10 July (Official State Gazette 11/07/1987)
17. Royal Decree 243/2009 of 27 February, on the supervision and control of shipments of radioactive waste between Member States and into and out of the Community (Official State Gazette 02/04/2009)
18. Royal Decree 551/2006 of 5 May, regulating the transport of dangerous goods by road within Spanish territory (Official State Gazette 12/05/2006), amended by Ministerial Order on 5 October 2010
19. Royal Decree 412/2001 of 20 April, regulating various aspects relating to the transport of dangerous goods by rail (Official State Gazette 08/05/2001), amended by Ministerial Order on 1/02/2007
20. Royal Decree 1749/1984 of 1 August, approving the National Regulation on the transport of dangerous goods by air (Official State Gazette 02/10/1984), amended by Ministerial Order on 28/12/1990
21. Royal Decree 145/1989 of January 20, approving the National Regulation on the admission, handling and storage of dangerous goods at ports (Official State Gazette 13/02/1989)

3. Council instructions

- ✓ Nuclear Safety Council Instruction IS-01 of 31 May 2001, defining the format and content of the individual radiological monitoring document (radiological passport) regulated in Royal Decree 413/1997 (Official State Gazette 06/08/2001)
- ✓ Nuclear Safety Council Instruction IS-02 revision 1, on documentation of refuelling activities at light water reactor nuclear power plants (Official State Gazette 16/09/2004)
- ✓ Nuclear Safety Council Instruction IS-03 of 6 November 2002, on qualifications required to obtain recognition as an expert in protection against ionising radiation (Official State Gazette 12/12/2002)
- ✓ Nuclear Safety Council Instruction IS-04 of 5 February 2003, regulating the transfer, archiving and custody of documents corresponding to the radiological protection of workers, the public and the environment, prior to the transfer of licences for nuclear power plants for dismantling and decommissioning (Official State Gazette 28/02/2003)
- ✓ Nuclear Safety Council Instruction IS-05 of 26 February 2003, defining exemption values for nuclides as established in Tables A and B of Annex I of Royal Decree 1836/1999 (Official State Gazette 10/04/2003)

- ✓ Nuclear Safety Council Instruction IS-06 of 9 April 2003, defining training programmes on basic and specific radiological protection regulated in Royal Decree 443/1997 of 21 March, in relation to nuclear facilities and fuel cycle radioactive facilities (Official State Gazette 03/06/2003). On 28 October 2004, the CSN issued a circular to all external companies clarifying certain aspects of the practical application of this Instruction.
- ✓ Nuclear Safety Council Instruction IS-07 of 22 June 2005, on fields of application of personnel licences for radioactive facilities (Official State Gazette 20/07/2005)
- ✓ Nuclear Safety Council Instruction IS-08 of 27 July 2005, on the criteria applied by the Nuclear Safety Council for requiring specific guidance on radiological protection for the licensees of nuclear and radioactive facilities (Official State Gazette 05/10/2005)
- ✓ Nuclear Safety Council Instruction IS-09 of 14 June 2006, establishing the criteria to be applied to systems, services and procedures for the physical protection of nuclear facilities and materials (Official State Gazette 07/07/2006)
- ✓ Nuclear Safety Council Instruction IS-10 of 25 July 2006, establishing criteria for reporting events to the Nuclear Safety Council by nuclear power plants (Official State Gazette 03/11/2006)
- ✓ Nuclear Safety Council Instruction IS-11 of 21 February 2007, on licences for operating personnel at nuclear power plants (Official State Gazette 26/04/2007)
- ✓ Nuclear Safety Council Instruction IS-12, of 28 February 2007, defining the qualification and training requirements of non-licensed staff and off-site personnel of nuclear power plants (Official State Gazette 11/05/2007).
- ✓ Nuclear Safety Council Instruction IS-13 of 21 March 2007, on radiological criteria for the release of nuclear facility sites (Official State Gazette 07/05/2007)
- ✓ Nuclear Safety Council Instruction IS-14 of 24 October 2007, on resident CSN inspectors at nuclear power plants (Official State Gazette 08/11/2007)
- ✓ Nuclear Safety Council Instruction IS-15 of 31 October 2007, on requirements for monitoring of the effectiveness of maintenance activities at nuclear power plants (Official State Gazette 23/11/2007)
- ✓ Nuclear Safety Council Instruction IS-16 of 23 January 2008, regulating the periods of time during which the documents and records of radioactive facilities should be kept in the archive (Official State Gazette 12/02/2008)
- ✓ Nuclear Safety Council Instruction IS-17 of 30 January 2008, on the recognition of training courses or programmes for personnel operating or managing the operation of equipment at X-ray facilities for medical diagnosis and accreditation of the personnel at these facilities (Official State Gazette 19/02/2008)
- ✓ Nuclear Safety Council Instruction IS-18 of 2 April 2008, on the criteria applied by the Nuclear Safety Council for requiring licensees of radioactive facilities to report on radiological events or incidents (Official State Gazette 16/04/2008)
- ✓ Nuclear Safety Council Instruction IS-19 of 22 October 2008, on the requirements of the management system for nuclear facilities (Official State Gazette 08/11/2008)
- ✓ Nuclear Safety Council Instruction IS-20 of 28 January 2009, establishing safety requirements relating to spent fuel storage casks (Official State Gazette 18/02/ 2009)
- ✓ Nuclear Safety Council Instruction IS-21 of 28 January 2009, on requirements applicable to nuclear power plant modifications (Official State Gazette 19/02/2009)

- ✓ Nuclear Safety Council Instruction IS-22 of 1 July 2009, on safety requirements for the management of ageing and the long-term operation of nuclear power plants (Official State Gazette 10/07/2009)
- ✓ Nuclear Safety Council Instruction IS-23 of 4 November 2009, on in-service inspections at nuclear power plants (Official State Gazette 24/11/2009)
- ✓ Nuclear Safety Council Instruction IS-24 of 19 May 2010, regulating the archiving of nuclear facility documents and records and the timescale for their retention (Official State Gazette 01/06/2010)
- ✓ Nuclear Safety Council Instruction IS-25 of 9 June 2010, on criteria and requirements for the performance of probabilistic safety assessments and their application to nuclear power plants (Official State Gazette 24/06/2010)
- ✓ Nuclear Safety Council Instruction IS-26 of 16 June 2010, on basic nuclear safety requirements applicable to nuclear facilities (Official State Gazette 08/07/2010)
- ✓ Nuclear Safety Council Instruction IS-27 of 16 June 2010, on general nuclear power plant design criteria (Official State Gazette 08/07/2010)
- ✓ Nuclear Safety Council Instruction IS-28 of 22 September 2010, on the technical specifications that must be observed by 2nd and 3rd category radioactive facilities (Official State Gazette 11/10/2010)
- ✓ Nuclear Safety Council Instruction IS-29 of 13 October 2010, on safety criteria at storage facilities for spent fuel and high level radioactive waste (Official State Gazette 02/11/2010)
- ✓ Nuclear Safety Council Instruction IS-30, of 19 January 2011, on the requirements of the fire protection programme for nuclear power plants (Official State Gazette 16/02/2011)
- ✓ Nuclear Safety Council Instruction IS-30, revision 1 of 21 February 2013, on the requirements of the fire protection programme for nuclear power plants (Official State Gazette 14/03/2013)
- ✓ Nuclear Safety Council Instruction IS-31 of 26 July 2011, on criteria for the radiological control of waste materials generated at nuclear facilities (Official State Gazette 17/09/2011)
- ✓ Nuclear Safety Council Instruction IS-32 of 16 November 2011, on technical specifications of nuclear power plant operation (Official State Gazette 05/12/2011)
- ✓ Nuclear Safety Council Instruction IS-33 of 21 December 2011, on radiological criteria for protection against exposure to natural radiation (Official State Gazette 26/01/2012)
- ✓ Nuclear Safety Council Instruction IS-34 of 18 January 2012 on criteria relating to measures for radiological protection, reporting of nonconformities, availability of persons and resources in emergencies and load monitoring during the transport of radioactive material (Official State Gazette 04/02/2012)
- ✓ Nuclear Safety Council Instruction IS-35 of 4 December 2013, concerning the treatment of design modifications of transport packages for radioactive material with a certificate of approval of Spanish origin and of physical or operational modifications to packages carried out by the sender (Official State Gazette 04/01/2014)

Annex B

Licensing process for nuclear and radioactive facilities

The licensing process for both nuclear and radioactive facilities is governed by the Regulation on Nuclear and Radioactive Facilities (RNRF), approved by Royal Decree 1836/1999 of 3 December, and amended by Royal Decree 35/2008 of 18 January, Royal Decree 1308/2011 of 26 September and Royal Decree 102/2014.

In accordance with the RNRF, these authorisations are granted by the Ministry of Industry, Energy and Tourism (MINETUR), to which the corresponding applications must be submitted, together with the documentation required in each case. The MINETUR sends a copy of each application and the accompanying documentation to the Nuclear Safety Council (CSN) for its mandatory report.

The CSN reports are mandatory and binding whether they are negative and deny authorisation, or if they impose conditions when they are positive.

Where appropriate, the MINETUR will send a copy of all the documentation to the Autonomous Communities with competence in matters of land usage and the environment where the facility or the area included in the basic regulations on planning for nuclear and radiological emergencies is located. They then have a period of one month in which to make any representations.

On receiving the report from the CSN, and subject to any relevant rulings, reports or representations, the MINETUR will adopt the appropriate resolution.

1. Licensing system for nuclear facilities

According to the RNRF, the following are defined as nuclear facilities:

1. Nuclear power plants
2. Nuclear reactors
3. Manufacturing facilities using nuclear fuels to produce nuclear substances and those at which nuclear substances are treated
4. Facilities for the storage of nuclear substances
5. Devices and facilities using nuclear fusion or fission to produce energy or with a view to producing or developing new sources of energy

In accordance with the RNRF, nuclear facilities require different administrative authorisations for their operation, as follows: prior or siting authorisation; a construction permit; an operating permit; an authorisation for modification; and an authorisation for dismantling and decommissioning, which is finalised with a statement of decommissioning, or an authorisation for dismantling and closure, which is finalised with a statement of closure. The procedure for granting each of these authorisations is governed by the Regulation and is briefly described below.

Prior authorisation

Prior or siting authorisation constitutes official recognition of the proposed purpose and the suitability of the selected site. This authorisation allows the licensee to begin work on the authorised preliminary infrastructure and to apply for the construction permit for the facility.

Applications for prior authorisation must be accompanied by the following documents:

a) Statement of the needs to be met, and justification for the facility and the selected site

b) Descriptive report on the fundamental components of the facility, along with basic information on the facility

c) Preliminary construction plan, including the phases and schedule for execution and a preliminary economic study of the predicted financial investments and costs

d) Characterisation study for the site and the facility's area of influence

e) Projected organisation for supervision of the project and quality assurance during construction

f) Description of the preliminary infrastructure work and activities to be carried out

During the processing of this application, there is a period of public information, which is described in detail in Point 3 of this Annex.

Construction permit

This empowers the licensee to begin construction of the facility and to apply for the operating permit.

This application must be accompanied by the following documentation:

a) General plan of the facility

b) Procurement schedule

c) Budget, financing, implementation schedule and system for technical collaboration

d) Economic study updating the study submitted with the application for prior authorisation

e) Preliminary Safety Analysis, which in turn must include the following:

1. Description of the site and surrounding area
2 Description of the facility
3. Analysis of foreseeable accidents and their consequences
4. Radiological analysis
5. Update on the projected organisation for supervision of the project and quality assurance during construction
6. Projected organisation for the future operation of the facility and preliminary training programme for operating personnel
7. Pre-operational environmental radiological monitoring programme
8. Quality assurance programme for construction

f) Technological, economic and financing provisions for dismantling and decommissioning

g) Administrative authorisations and licenses to be granted by other Ministries and Public Administrations or documents accrediting application for authorisations, in compliance with all the necessary requirements

During the construction and assembly of a nuclear facility, and prior to loading the fuel or the acceptance of nuclear substances at the facility, the licensee of the authorisation is obliged to implement a pre-nuclear testing programme. This is to confirm the satisfactory performance of the equipment or components of the facility, in relation both to nuclear safety and radiation protection and to the applicable industrial and technical standards.

The proposal for the pre-nuclear testing programme must be submitted by the holder of the authorisation and requires the approval of the Directorate General for Energy Policy and Mines, subsequent to a report from the CSN.

The results of the pre-nuclear testing programme must be submitted to the Directorate General for Energy Policy and Mines and the CSN for analysis before the operating permit may be granted.

Operating permit

This permit allows the licensee to load the nuclear fuel or accept nuclear substances at the facility, to implement the nuclear testing programme and to operate the facility under the conditions established in the authorisation. The permit is provisional until the nuclear testing has been satisfactorily completed.

In order to obtain the operating permit, the licensee must submit the following documents:

a) Safety analysis: this must contain sufficient information to enable an analysis of the facility from the point of view of nuclear safety and radiological protection, and a risk assessment on the facility's operation, both under normal operating conditions and accident conditions. It must include the following:

   1. Supplementary data on the site and its characteristics, obtained during construction
   2. Description of the facility and its processes
   3. Analysis of foreseeable accidents and their consequences
   4. Radiological analysis of the facility
   5. Operational environmental radiological monitoring programme

b) Operating Regulations: these must contain the following information:

   1. List of posts entailing nuclear responsibility
   2. Personnel functions and organisation, and a description of the safety management system implemented
   3. Operating regulations under normal and accident conditions

c) Technical Operating Specifications (TOS): these contain the limit values for variables affecting safety and the minimum operating conditions.

d) On-site Emergency Plan: this details the licensee's projected measures and the assignment of responsibilities to address accident conditions.

e) Nuclear testing programme: this must describe the tests, their objectives, the specific techniques to be used and the expected results.

f) Quality assurance manual: this establishes the scope and content of the quality assurance programme applicable to safety-related systems, structures and components.

g) Radiological protection manual: this includes the facility's radiological protection standards.

h) Management plan for radioactive waste and spent fuel: this includes a system for the potential clearance of waste material with radioactive content.

i) Final economic study: this analyses compliance with the economic and financial forecasts and sets out the full and effective cost of the facility.

j) Dismantling and decommissioning provisions: these set out the disposal arrangements projected for the generated waste and include a study of the cost and the economic and financial provisions to guarantee decommissioning.

On completion of the nuclear testing programme, the licensee must submit the results to the Directorate General for Energy Policy and Mines and the CSN, together with a proposal for modifications to the TOS if advisable in view of the tests performed.

The CSN issues a report to the MINETUR on the results of the tests and any modifications to be made, and on the conditions included in the operating permit for the time period established. The MINETUR then issues the operating permit for the corresponding period.

Authorisation for modification

The RNRF sets out that modifications to the design or to the operating conditions that affect the nuclear safety or radiological protection of the facility, as well as the performance of tests at the facility, should be previously analysed by the licensee in order to verify the continued fulfilment of the criteria, regulations and conditions on which the authorisation is based. If, as a result of this analysis, the licensee determines that these requirements continue to be met, the modifications may be carried out, with regular reporting to the competent regulatory authorities. If, however, the design modification involves a change in the criteria, regulations and conditions on which the operating permit is based, the licensee must apply for an authorisation for modification. This must be issued before the modification enters into service or tests are performed. Regardless of this authorisation, whenever the regulatory authorities judge that the modification is extensive or entails significant construction work, the licensee must apply for an authorisation for construction and assembly of the modification. This must be obtained before beginning any assembly or construction activities related to the modification.

The application for the authorisation for modification should be accompanied by the following documentation:

a) Technical description of the modification

b) Safety Analysis

c) Details of the documents affected by the modification

d) Details of the tests to be performed prior to the recommencement of operation

The application for authorisation for construction and assembly of the modification, when required, should be accompanied by the following documentation:

a) General description of the modification and the reason for its construction

b) Standards to be applied in the design, construction, assembly and testing of the modification

c) Basic design of the modification

d) Projected organisation and quality assurance programme for implementation of the project

e) Determination of the scope and content of the analyses necessary for demonstrating the modification's compatibility with the rest of the facility and for ensuring the continued maintenance of its safety levels

f) Plans for equipment being replaced

g) Procurement plan and budget in the case of major modifications

Authorisation for dismantling and decommissioning

On expiry of the operating permit, this authorisation allows the licensee to initiate activities for decontamination, disassembly of equipment, demolition of structures and removal of materials, with the ultimate aim of the restricted or unrestricted release of the site. The dismantling process ends with the statement of decommissioning.

The application for the authorisation for dismantling and decommissioning must be accompanied by the following documentation:

a) Safety Analysis

b) Operating Regulations

c) Technical specifications applicable during the dismantling phase

d) Quality assurance manual

e) Radiological protection manual

f) On-site Emergency Plan

g) Management plan for radioactive waste and spent fuel

h) Site restoration plan

i) Economic study of the dismantling process and its associated financial provisions

j) Plan for the control of clearable materials

The authorisation for dismantling and decommissioning sets out the general approach to be adopted. If the process is to be implemented in various phases, it will regulate only the activities planned for the immediate phase.

On completion of dismantling activities, and after verification of compliance with the provisions for the site restoration plan and the remaining technical conditions set out in the dismantling programme, the MINETUR will issue the statement of decommissioning, subject to a report by the CSN. This statement releases the licensee of the facility from their responsibility as operator, and in the event of restricted release of the site, defines the applicable limitations on usage and the party responsible for maintaining and monitoring compliance with these limitations.

Prior to issuing the statement of decommissioning, the Ministry will refer the matter to the Autonomous Communities with competence in matters of land usage and the environment where the facility is located. They then have a period of one month in which to make any representations.

✓ Authorisation for dismantling and closure (for disposal facilities for spent nuclear fuel and radioactive waste):

This entitles the licensee of disposal facilities for spent nuclear fuel and radioactive waste to begin the final engineering or other work required to ensure the long term safety of the storage system. It also authorises dismantling activities on determined auxiliary installations, ultimately

enabling the delimitation of areas which must be subject to radiological or other types of surveillance and monitoring, as appropriate, during a specific period of time, and the release from control of the remaining areas of the site. The dismantling and closure process is finalised by a statement of closure issued by the Ministry of Industry, Energy and Tourism, subject to report by the Nuclear Safety Council.

2. Licensing system for radioactive facilities

According to the RNRF, radioactive facilities are defined as follows:

- ✓ Facilities of any type that contain a source of ionising radiation
- ✓ Devices producing ionising radiation operating at a potential difference of more than 5 kV
- ✓ Establishments, laboratories, factories and facilities at which radioactive materials are produced, used, held, treated, handled or stored, except in the case of incidental storage during transport

Radioactive facilities are divided into three categories.

1. Category 1 radioactive facilities are nuclear fuel cycle facilities, industrial irradiation facilities and complex installations handling extensive inventories of radioactive substances with a potentially significant radiological impact. Radioactive facilities involved in the nuclear fuel cycle, i.e. manufacturing facilities producing uranium, thorium and their compounds, or facilities producing fuel assemblies from natural uranium, require the same authorisation as nuclear facilities. The application, processing and granting of these authorisations is carried out in accordance with the process described in Section 1 above, with the corresponding documents relevant to the special characteristics of these facilities.
2. Category 2 and 3 radioactive facilities are those used for scientific, medical, commercial or industrial purposes which cannot be considered as Category 1 and are classified fundamentally on the basis of their radiological characteristics. This type of facility requires an operating permit, a statement of decommissioning and, where appropriate, authorisation for modification or transfer of license.

The application for the operating permit for radioactive facilities with scientific, medical, commercial or industrial purposes must be accompanied by the following documents:

a) Descriptive report on the facility

b) Safety Analysis: analysis and assessment of the risks that might arise as a result of the normal operation of the facility or in the event of an accident

c) Verification of the facility: including a description of the testing which it has undergone

d) Operating Regulations: practical measures ensuring the safe operation of the facility

e) List of projected personnel, organisational structure and responsibilities of each post

f) On-site Emergency Plan: projected measures and assignment of responsibilities in response to accident conditions

g) Provisions for decommissioning and economic coverage

h) Budget for the investment to be made

In the case of Category 1 facilities, the following documentation must also be submitted:

a) Information on the site and surrounding area

b) As part of the Operating Regulations:

- ✓ Quality Assurance Manual
- ✓ Radiological Protection Manual
- ✓ Technical Operating Specifications

c) Physical Protection Plan

The Ministry of Industry, Energy and Tourism is responsible for granting operating permits, license transfers and statements of decommissioning for Category 1 radioactive facilities. MINETUR Order IET/556/2012 of 15 March, however, assigns this responsibility to the Secretary of State for Energy. These authorisation processes include submission of the corresponding documentation to the Autonomous Community, which has a period of one month in which to make any representations.

The granting of all other authorisations for regulated radioactive facilities in this section is the responsibility of the Directorate General for Energy Policy and Mines.

When the licensee is ready to commence operation of the facility, the CSN must be notified, so it can perform an inspection of the facility. Once the CSN considers that the facility is in a position to operate safely it informs the MINETUR, which then issues a 'Start-Up Notification', authorising the licensee to commence operation of the facility.

Changes affecting the licensing of the facility, its location, the activities permitted by the authorisation granted, the category of the facility, or the incorporation of particle accelerators or additional radioactive material not previously authorised require authorisation by means of the same procedure as that for the issuance of the operating permit.

Changes and modifications affecting other aspects of the design or authorised operating conditions for the facility require only the express approval of the Nuclear Safety Council prior to implementation, which the NSC reports to the Ministry of Industry, Energy and Tourism.

Application for the statement of decommissioning must be accompanied by the following documentation:

a) Technical decommissioning study

b) Economic study, including the cost of decommissioning and financing provisions

Once the CSN has verified the absence of radioactive substances or equipment producing ionising radiation, and the results of the contamination analysis for the facility, it submits a report to the MINETUR, which then issues the statement of decommissioning for the installation.

In accordance with the provisions of the Spanish Constitution, the different Statutes of the Autonomous Communities and the corresponding legislation, the MINETUR's services and functions with regard to Category 1 and 2 radioactive facilities have been transferred to various 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, Castile-Leon, La Rioja and Aragón[1].

[1] *Additional Provision 3 of Law 15/1980, creating the CSN, empowers the Council to concede to the Autonomous Communities the exercise of certain of its own assigned functions. Nevertheless, these concessions are not considered assignments, since, in accordance with this Law, the CSN is the sole responsible body for nuclear safety for the entire country.*

3. Access to information and public participation in the authorisation process for facilities

Both the RNRF and Law 21/2013 on environmental assessment require public information procedures, the most important of which is that undertaken during the prior authorisation process for a nuclear facility or radioactive facility involved in the fuel cycle.

With regard to the prior authorisation process for nuclear facilities and radioactive facilities involved in the nuclear fuel cycle, the RNRF stipulates that once the application for authorisation has been received, the Government's Regional Office in the Autonomous Community where the facility is to be located will begin a period of public information. This will start with publication in the Official State Gazette and in the corresponding Autonomous Community's Gazette of an announcement outlining the facility's objective and main characteristics. The individuals and entities who consider themselves affected by the project then have a period of thirty days in which to make any relevant representations. On expiry of the thirty-day public information period, the Government's Regional Office carries out the relevant checks on both the documentation submitted by the public and the written representations. It then issues a report, sending the dossier to the MINETUR and a copy to the CSN.

Law 21/2013 sets out that standard Environmental Impact Assessments must be carried out on projects for nuclear power plants and other nuclear reactors, reprocessing facilities for irradiated nuclear fuel, facilities designed for the manufacture or enrichment of nuclear fuel, spent nuclear fuel disposal facilities, disposal facilities solely for radioactive waste, and facilities solely for the storage (planned for more than 10 years) of irradiated nuclear fuels or radioactive waste in a different site than the production site. In these cases, the public information process is implemented jointly for the Environmental Impact Study, required by Law 21/2013 and the prior authorisation for the projected facility, required by the RNRF. The Environmental Impact Statement is drawn up by the Ministry of Agriculture, Food and the Environment, in coordination with the CSN and is issued in combination with the prior authorisation for the facility. Likewise, the dismantling and decommissioning of nuclear power plants and reactors is also subject to a standard Environmental Impact Assessment.

The RNRF also requires that an Information Committee is in place during the construction, operation and dismantling of nuclear power plants. This committee is a multijurisdictional body whose duties are to inform the different entities represented about the performance of the activities regulated in the corresponding authorisations and to jointly address issues of interest to these entities. The committee is chaired by a representative of the MINETUR and includes one representative each from: the licensee of the facility; the CSN; the Government's Regional Office; the Autonomous Community; the Directorate General for Civil Defence and Emergencies; and the municipal areas included in Zone 1 of the corresponding Off-site Emergency Plan for the nuclear power plant. Other representatives from Public Administrations may also sit on the Committee when the particular matters to be addressed require their participation.

At municipal level, the Association of Municipalities in Areas with Nuclear Power Plants (AMAC) acts as a liaison with the Administration on various aspects relating to nuclear power plants.

In terms of general information, amongst the CSN's assigned functions is the task of informing the public about matters for which it is responsible, without prejudice to the public notification of its administrative activities under the legally established terms. Another significant element in this regard is the CSN's Guidance Committee, created by Law 33/2007 of 7 November (reforming Law 15/1980 of 22 April on the creation of the Nuclear Safety Council). Its purpose is to issue recommendations to the Council on matters of transparency and propose measures to reinforce public access to information and public participation in matters for which it is responsible.

It is comprised of representatives from the CSN, various Ministries, Autonomous Communities, licensees of nuclear facilities, trade unions, experts, NGOs, municipalities and other interested parties.

A final point of note is 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, made in Aarhus (Denmark). Law 27/2006 of 18 July, regulating rights of access to information, public participation and access to justice in environmental matters, recognises the right of any legal or natural person to access information on the environment held by the Public Administrations, as well as the obligation of the Administrations to disseminate this information.

Annex C

Summary of measures adopted by Spain in light of the Fukushima Daiichi accident. Post-Fukushima National Action Plan

Following the accident at Fukushima, in 2011 the CSN issued a series of mandatory Supplementary Technical Instructions (STIs) associated with the operating permits for facilities, requiring licensees to carry out a supplementary safety analysis taking into account beyond design basis events. These STIs were issued to operational nuclear power plants, the Juzbado fuel assembly manufacturing facility and the José Cabrera nuclear power plant undergoing dismantling. The first series of STIs took into account extreme events of natural origin (earthquakes, flooding, etc.) and prolonged loss of electrical power and/or loss of ultimate heat sink, and required a description of accident management measures currently in place for the various stages of the following scenarios:

- ✓ loss of the core cooling system and threats to the integrity of containment;
- ✓ loss of the spent fuel pool cooling system.

On completion of the stress tests for European nuclear power plants, whose scope included past situations and a peer review phase, and in accordance with the agreements of the ENSREG framework, the CSN produced a National Action Plan (NAcP)[1]. This details the projected activities in Spain in response to the Fukushima nuclear power plant accident. The Plan was completed and submitted to ENSREG in December 2012 and was then subject to a new peer review process, which concluded with a seminar held in Brussels in April 2013.

The Spanish NAcP, which was also submitted to the Lower House of Parliament, includes a comprehensive catalogue of completed and ongoing actions in relation to programmes implemented nationally and internationally in response to the Fukushima accident. It lists the dates of implementation for each action, organised within a three-phase schedule: short term (2012), medium term (2014) and long term (2016).

It should be pointed out that following the stress tests, the licensees of the facilities submitted proposals for improvements which, together with a series of additional requirements, were included in a further series of STIs for the facilities and reflected in the NAcP. The main actions for nuclear power plants within this Plan are:

- ✓ Analysis of the plant's capacity to withstand natural beyond design basis events and implementation of the improvements identified by this analysis, such as increasing the seismic margin of equipment significant to the postulated initiating events in the stress tests.

[1] *Link to the National Action Plan report:*
http://www.csn.es/index.php?option=com_content&view=article&id=24511%3Ael-csn-remite-a-la-comision-europea-el-plan-deaccion-nacional-de-seguimiento-post-fukushima-tras-las-pruebas-de-resistencia-&catid=13%3Anoticias&Itemid=29&lang=es

- ✓ Implementation of improvements to reinforce the plant's capacity to withstand events involving prolonged loss of electrical power or the capacity for residual heat removal in the reactor core, including relevant fixed equipment and mobile devices.
- ✓ Improvements in emergency management, including the reinforcement of available human resources and the construction at each site of an alternative Emergency Management Centre. At national level, the implementation of an Emergency Support Centre with the capacity to send human and material resources to any site within 24 hours.
- ✓ Improvements in the capacity to prevent and mitigate severe accidents in the reactor or spent fuel pool, including additional protection measures for containment (installation of filtered containment venting and passive autocatalytic recombiners in all plants).
- ✓ Measures aimed at the improvement of radiological protection for workers involved in accident situations.

Another noteworthy point about the NAcP is that, complementary to the scope of the stress tests, the CSN issued Supplementary Technical Instructions to the operational nuclear power plants and the José Cabrera plant undergoing dismantling for improving the protection of these plants against other extreme events of human origin which could cause the loss of large areas of facilities and impact seriously on their safety or on the environment and public health. The basic aspects included in this process are:

- ✓ the capacity to withstand beyond design basis fires at the plant;
- ✓ the capacity to mitigate severe damage to fuel (both in the reactor core and in the spent fuel storage facilities);
- ✓ actions to limit liquid or gaseous radioactive releases.

Safety improvements to spent fuel pools

In the specific area of spent fuel pools, the National Action Plan includes certain measures required for all facilities:

- ✓ Implementation of actions to increase the seismic resistance of equipment associated with spent fuel pool integrity and cooling (reassessment of the seismic capacity of the structure and the pool lining, fuel racks and cooling systems). Specifically, the scope of the seismic margin analysis has been extended to include the SSCs necessary to ensure spent fuel pool integrity and cooling. Amongst the measures to ensure greater robustness of the plant in the event of seismic events, the plants have revised or proposed revision of the margins for equipment used in response to a complete loss of electrical power (station blackout, SBO) and in the case of severe accidents. It has been verified that these SSCs can be assigned a seismic margin equal to or greater than 0.3g, or alternatively, additional measures have been planned for compliance. Another aspect analysed has been the potential loss of water from the spent fuel pool or the heat sink ponds, as applicable, as a result of sloshing. It was determined that for the intensity of the earthquake considered (both the DBE and the seismic margin of 0.3g) this effect would not be relevant in any case.
- ✓ Implementation of measures in response to spent fuel pool accidents: water makeup and spraying of fuel assemblies stored in the pool (both from outside the building).

- ✓ Analysis of additional measures for the monitoring equipment for the level and temperature of the spent fuel pool, also taking into account the prolonged loss of internal and external electrical power (SBO): level, environmental criteria, etc.

In addition, specific measures are required for certain facilities, such as review of the dose rate studies in the spent fuel pool area on the basis of potential loss of water from the pool.

Modifications to emergency procedures and emergency management guidelines

Following the Fukushima accident, the group of owners has identified various aspects for improvement both in the Emergency Operating Procedures (EOP) and the Severe Accident Management Guidelines (SAMG).

The main modifications in the EOP and SAMG will be aimed at better management of the hydrogen generated in a severe accident and prevention of containment overpressure. Furthermore, one of the fundamental modifications in the EOP and SAMG will be the consideration of new portable and autonomous devices used in the Extensive Damage Mitigation Guidelines (EDMG), which are in production, using NEI 06-12 (*B.5.b Phase 2 and 3 Submittal Guideline Revision 2 December 2006*) as a reference. This is already implemented in United States nuclear power plants in order to manage accidents which involve the loss of large areas due to fire and the potential loss of normal management and control of the emergency. The EDMG (and their associated equipment) include the following basic objectives: supplying water to the reactor vessel to cool the core; containment venting to maintain integrity; and makeup water/spraying in the pool to prevent spent fuel exposure. This is all for extreme conditions which prevent the use of the plant's fixed equipment.

The final implementation of the new EOP is planned for 2016. It will include requirements derived from the new WENRA reference levels, revised in light of the Fukushima accident, and specifically, mitigation measures for spent fuel pools. Before this, the CSN will issue a new Safety Instruction on Emergency Procedures and Severe Accident Management. Some changes with reference to spent fuel pools have already been incorporated in partial revisions of the Emergency Operating Procedures.

Annex D

References to reports on international review missions performed at the request of a Contracting Party

Follow-up assessment of the IRRS (Integrated Regulatory Review Service) Mission

In February 2011, the CSN hosted a follow-up mission to the IRRS (Integrated Regulatory Review Service) mission carried out by the International Atomic Energy Agency (IAEA) in Spain in 2008. The 2008 mission, requested by the Spanish Government in response to a request by the Nuclear Safety Council (CSN), was the first to take a comprehensive approach, including aspects relating to physical safety.

The follow-up mission focused on the progress made by Spain in responding to the recommendations and suggestions of the IRRS mission of 2008 and on the review of those areas that had changed significantly since that time. In the area of waste, the 2008 mission identified two suggestions and one recommendation:

- ✓ One suggestion concerned the involvement of the Nuclear Safety Council in the development and approval process for the General Radioactive Waste Plan (GRWP). This suggestion was finalised during the follow-up mission, recognising the legislative amendments integrating the CSN in the approval process of the GRWP by means of its issuance of a mandatory report.
- ✓ The other suggestion referred to the establishment and maintenance of a national inventory of existing and expected radioactive waste, including waste generated outside regulated facilities. This suggestion was also finalised, in view of the activities carried out in Spain to identify and characterise waste categories, and the progress of the CSN/MITYC(MINETUR)/ENRESA mixed working group constituted for this purpose.
- ✓ The 2008 recommendation concerned the development and communication of plans for the disposal of spent fuel and high level radioactive waste. As a result of the 2011 follow-up mission, the recommendation was modified, in light of the progress made on site selection for the Centralised Temporary Storage facility (CTS) and in the licensing of various on-site spent fuel storage facilities at different Spanish nuclear power plants. The new recommendation is aimed at continuing efforts to define a framework for the disposal of spent fuel and high level waste, taking advantage of the experience acquired during the site selection for the CTS.

In addition, the 2011 IRRS follow-up mission recognised the process established for the Centralised Temporary Storage facility site selection as a best practice, praising its transparency and solid technical basis. The process of site selection and designation, described in detail in the previous report, was not completed until the end of 2011 (within the timeframe of this Report). The successive phases, therefore, are briefly summarised below.

1. Public information process
2. Announcement in the Official State Gazette 29/12/2009
3. Submission of the list of candidates
4. Candidate selection, 20/09/2010
5. Spanish Government's designation of the site, 30/12/2011

The results of the IRRS mission[1] and the follow-up mission[2] have been published on the CSN website. Furthermore, the National Reports to the Convention on Nuclear Safety and the Joint Convention describe the manner in which the results of the peer reviews and international missions have been addressed.

Post-Fukushima National Action Plan

As detailed in Annex C, Spain produced a post-Fukushima National Action Plan (NAcP), which includes a comprehensive catalogue of completed and ongoing actions within the projected scope of the stress tests for European nuclear power plants and, supplementary to this, actions for improving the protection of the plants against other extreme events of human origin which could cause the loss of large areas of facilities. This NAcP was subject to a peer review process within the European Union.

The peer review process for the National Action Plans was completed with a seminar organised by ENSREG, held in Brussels in April 2013. The NAcPs and the final report on the peer review process were published by ENSREG[3] and by each of the regulators involved in the peer review process.

As a result of the peer review of National Action Plans, the Spanish NAcP was assessed positively, with various best practices identified, such as the regulator's issuance of Supplementary Technical Instructions (STIs), the maintenance of close cooperation between the regulator and the licensees, the improvements to the seismic margin of systems, the remote access capability for radiation data and the implementation of on-site emergency centres and a national support centre. Also positively assessed was the Spanish practice of the performance of Periodic Safety Reviews (PSRs) in nuclear power plants as part of the license renewal process, as well as inclusion within their scope of aspects related to severe accident management.

The progress of the post-Fukushima National Action Plans will be reviewed at a further seminar within the ENSREG framework, which is planned for 2015.

[1] http://www.csn.es/images/stories/documentos_adjuntos/actualidad_y_datos/irrs/irrsinglesokok1.pdf

[2] http://www.csn.es/images/stories/actualidad_datos/noticias/follow_up_informe_final_ingls_2011.pdf

[3] http://www.ensreg.eu/sites/default/files/HLG_p%282013-24%29_120%20Final%20NAcP%20Workshop%20Summary%20Report.pdf

ANNEX E

CIVIL LIABILITY REGIME FOR NUCLEAR DAMAGE

INTERNATIONAL CONVENTIONS AND NATIONAL LEGISLATIVE PROVISIONS

Spain is a Party to the Paris Convention and the Brussels Supplementary Convention on Third Party Liability in the Field of Nuclear Energy (international conventions established by the OECD Nuclear Energy Agency), signed in 1960 and 1963 respectively and both subsequently amended in 1964 and 1982. The latest amendment is by means of two Amending Protocols signed in February 2004.

These Protocols, however, have not yet entered into force. Therefore, the current legal framework is that established by the Conventions without Protocol, by means of Chapters VII, VIII, IX and X of Law 25/1964, the Nuclear Energy Act of 29 April and Decree 2177/1967 approving the Regulations on nuclear risk coverage, as well as Additional Provision 1 of Law 17/2007 of 4 July, updating the amount of the liability limit to 700 M€, until the Law transposing the Protocols enters into force.

CURRENT CIVIL LIABILITY REGIME FOR NUCLEAR DAMAGE

The current framework regulating civil liability for nuclear damage is based on the following characteristics, in accordance with the commitments made as a Contracting Party to the Conventions cited above:

- ✓ The liability of the operator is strict and exclusive. It is limited in amount (up to 700 M€) and limited to a timeframe of 10 years (immediate damage) for the categories of damage set out.
- ✓ The Ministry of Industry, Energy and Tourism may establish a limit other than 700 M€, but not less than 30 M€, when this concerns the transport of nuclear substances or any other activity whose risk, in the opinion of the Nuclear Safety Council, does not require greater coverage.
- ✓ The categories of damage set out in the Law as eligible for compensation are as follows:

  I. Loss of human life, bodily injury and material damage produced as a direct or indirect result of ionising radiation emitted by any source of radiation inside a nuclear installation, or emitted from nuclear fuel or radioactive products or waste in, or of nuclear substances coming from, originating in, or sent to, a nuclear installation, whether arising from the radioactive properties of such matter, or from a combination of radioactive properties with toxic, explosive or other hazardous properties of such matter.

  II. Any other damage which is produced or originates in this manner as determined by the competent tribunal.

III. Loss of human life, bodily injury and material damage produced as a direct or indirect result of ionising radiation emitted by any other radioactive source.

- ✓ For the categories of immediate damage above, the nuclear facility operator is obliged to underwrite an insurance policy or other financial guarantee, up to an amount equivalent to the required coverage.
- ✓ For deferred damage claims, i.e. damage produced, notified or made known to the responsible party after the ten-year timeframe following the accident has expired, the Government will take the appropriate measures for compensation.
- ✓ Similarly, the Law sets out compensation payments for personal injury as a priority over all other compensation. In the event of insufficient coverage, the State will take legal measures to cover the difference.
- ✓ With regard to the timeframe for claims, although the nuclear legislation does not set specific limits, Law 1/2000 of 7 January on civil procedures sets out a standard 5-year period.
- ✓ Although they are excluded from the international conventions cited above, Category 1 radioactive facilities and shipments of non-nuclear radioactive material must be covered by a policy for a minimum amount of 6,000 €, in accordance with Decree 2177/1967 of 22 July, approving the Regulations on nuclear risk coverage. Category 2 and 3 facilities are exempt from this obligation.

Civil liability regime for nuclear damage following the entry into force in Spain of the Protocols of 12 February 2004 amending the Paris Convention on Third Party Liability in the Field of Nuclear Energy and of 12 February 2004 amending the Brussels Supplementary Convention

As explained above, two new amendments to the Paris and Brussels Conventions were approved in February 2004, involving a thorough revision of some of the basic elements of the nuclear civil liability regime. It has also entailed extensive amendment of the internal legal system in order to reflect the changes and specify the stipulations which, in accordance with the provisions of the Conventions, correspond to the Contracting States to establish within their national legislation. Law 12/2011 of 27 May, on civil liability for nuclear damage, updated the Spanish legal system in line with both Protocols, but will not enter into force until the Protocols enter into force in Spain.

Law 12/2011 has directly applied the precepts included in the amended Paris and Brussels Conventions. Having been published in the Official State Gazette, these precepts constitute part of the internal legal system as upper-tier laws. This Law, therefore, develops only those precepts for which the Paris Convention allows Contracting States the capacity to specify certain aspects. Consequently, the new legislation on civil liability in Spain will be based on the consolidated text of the two Conventions and the text of Law 12/2011.

The following includes the most significant changes to the current regime:

- ✓ Law 12/2011 incorporates new categories of damage which are not covered by the current regime. These include environmental damage, loss of income, preventative measures and reinstatement measures, provided damage is due to the radioactive properties of nuclear substances or when non-nuclear damage is not reasonably separable from nuclear damage.

- ✓ The quantitative limits established in Law 12/2011 are determined by the application of the Conventions:
  - ➪ The Paris Convention sets out a minimum of 700 million euros, which can be reduced to minimums of 70 million euros for low-risk installations not likely to cause extensive damage and 80 million euros for nuclear material transport activities. Based on this, the Law sets out that the Ministry of Industry, Energy and Tourism, subject to a Nuclear Safety Council report, may determine a reduced amount appropriate to each case, taking into consideration the nature of the activity or facility.
  - ➪ Furthermore, the Brussels Convention sets out three tiers of funding for compensation for nuclear accidents: the first tier covers either the minimum of 700 million euros set out by the Paris Convention or the amount set out as the responsibility of the operator by the State; the second tier covers from the amount fixed in the first tier up to 1,200 million euros (provided by the Contracting State in whose territory the liable operator's installation is situated); and the third (the joint responsibility of all the Contracting Parties of the Brussels Convention) covers up to a total amount of 1,500 million euros.
- ✓ Law 12/2011 establishes a limit of the operator's liability of 1,200 million euros, which covers the first and second tier of liability of the Brussels Convention. The State is solely responsible for its proportional share of the third tier of liability.
- ✓ With regard to the regulation of liability in the event of accidents during the transport of nuclear material, Law 12/2011 refers directly to the precepts of the amended Paris Convention, which set out all the specific cases relative to responsibility for damage occurring during transport. Law 12/2011 is only applicable in the case of transport to or from third countries which are not signatories of the Convention when the operator of the facility located in Spain is liable. The Law also allows the possibility that the transport company may be considered liable in place of the operator of the facility, provided the competent authority authorises this and the licensee of the facility is in agreement. Likewise, the transport company must prove that they have the financial guarantee in place which is required by this Law.
- ✓ With regard to the period for claims, Law 12/2011 follows the provisions of the revised Paris Convention, which establishes a general period of 30 years from the time of accident for actions involving loss of life and personal injury and 10 years for all other categories of damage. Within this general period, the Convention allows the establishment of a period of 3 years for the victims to submit their claims, determined from the date at which the person suffering nuclear damage had knowledge, or from the date at which that person ought reasonably to have known of both the nuclear damage and the operator liable. This is intended to facilitate the processing of claims, so that the compensation may be paid in the shortest time possible.
- ✓ Likewise, Law 12/2011 establishes a priority system during a three-year period from the time of the accident, during which it is estimated that the greatest number of claims will be submitted. The order of priority will be as follows: First to be addressed will be personal injury claims, calculating the amount of compensation by means of the scales used in legislation applicable to traffic accidents, since this assessment system is considered most appropriate to the purposes of the Law. Secondly, claims for environmental damage will be compensated, including costs for restoration measures and those due to preventative measures or possible damage caused by these measures. Finally, compensation will be paid for material damage, loss of income due to personal injury or material damage, and loss of income directly related to the use of the de-

graded environment. Once the initial three-year period has expired, there will be no prioritisation of types of claims. In the event that compensation surpasses the quantitative limits established by the Law, the State guarantees compensation for personal injury and death within Spanish territory.

- ✓ Law 12/2011 includes various options by which the licensee of the facility may guarantee their assigned responsibility. The most commonly used option is an insurance policy. With regard to this type of guarantee, the Law entails an amendment to the Insurance Compensation Consortium Statute, by means of which, besides its established function as a market reinsurer, the Consortium may now act as a co-insurer, together with insurance providers, for those categories of damage which can be insured but whose cover does not extend to either the monetary or time limits set out in the Law.
- ✓ With reference to the claims procedure, Law 12/2011 sets out that claims must be submitted following the standard general procedure for this type of claim, as stipulated in Law 1/2000 of 7 January on civil procedures.
- ✓ The Law also regulates civil liability for damage resulting from accidents involving radioactive materials which are not nuclear substances, which are beyond the scope of the Paris Convention. It sets out a system of liability similar to that for nuclear damage, i.e. strict and exclusive liability of the licensee of the facility, limited to the amounts established in the Annex of the Law, classified according to type of material and on the basis of activity. Likewise, the remaining specific aspects of this liability are governed in a similar manner to nuclear damage liability. Nevertheless, it should be noted that the coverage for risk of environmental damage in accidents involving radioactive materials which are not nuclear substances will be governed by the current legislation on matters of environmental liability. To this end, in virtue of Law 26/2007 of 23 October on environmental liability, the Ministry of Industry, Energy and Tourism, subject to reports from the Ministry of the Environment and the Nuclear Safety Council, will determine the minimum amount to be guaranteed by the operator to cover this damage.

Annex F

Fund for the financing of activities included in the General Radioactive Waste Plan

The Fund for the financing of activities included in the GRWP covers the activities carried out by ENRESA, not only in relation to the management of radioactive waste and spent fuel, but also to the dismantling and decommissioning of nuclear facilities, and the costs of overheads and R&D projects. It is funded by means of revenue from the fees listed below, including the financial returns generated by the revenue. These fees are currently regulated by Additional Provision 6 of Law 54/1997, the Electricity Industry Act of 27 November, made effective by Law 24/2013 of 26 December.

1. Fees charged to the electricity tariff (tolls)

This constitutes the method of financing the costs corresponding to the management of the radioactive waste and spent fuel generated at nuclear power plants that were definitively shut down prior to 1 January 2010. It includes dismantling and decommissioning costs, future costs that were not anticipated during the operation of nuclear power plants or fuel assembly manufacturing facilities which have been definitively shut down, and costs that, where relevant, might arise as a result of the early shutdown of the facility for reasons beyond the licensee's control.

Also included in these fees are the quantities set aside to cover the part of the Fund for the financing of the costs of managing radioactive waste deriving from research activities which the MINETUR determines to have been directly related to nuclear electricity generation, the dismantling and decommissioning operations to be performed as a result of the mining and production of uranium concentrates prior to 4 July 1984, the costs arising from the reprocessing of spent fuel sent abroad prior to the entry into force of the corresponding Law and any other costs that are specified by Royal Decree.

2. Fees charged to nuclear power plants

All costs incurred from 1 January 2010 corresponding to the management of radioactive waste and spent fuel generated by operational nuclear power plants are financed by the licensees of these plants during their operation, regardless of the date of generation of the waste and including costs corresponding to dismantling and decommissioning.

Also to be financed by the licensees of the nuclear power plants are the allocations for municipalities affected by nuclear power plants or storage or disposal facilities for spent fuel or radioactive waste, under the terms established by the MINETUR. The same applies to the sums correspond-

ing to taxes accrued in relation to radioactive waste and spent fuel storage or disposal activities, regardless of the date of generation of such waste.

3. Fees charged to the Juzbado Fuel Assembly Manufacturing Facility

This covers the provision of management services for radioactive waste resulting from the manufacturing of fuel assemblies, including the dismantling of the manufacturing facilities.

4. Fees charged to other facilities

Fees for the provision of services covering the management of radioactive waste generated at facilities other than those indicated above, such as radioactive facilities (medicine, industry, agriculture and research), CIEMAT or other companies. In all these cases the costs are allocated directly at the time of rendering the services.

Control of the Fund

The management of the Fund, which is the responsibility of ENRESA, is governed by principles of security, profitability and liquidity. As stated in previous National Reports, allocations to the Fund may be used only to cover the costs of activities included in the GRWP. On the conclusion of the period for radioactive waste management and dismantling of facilities set out in the GRWP, the total amount paid into the Fund via the different financing channels should cover the costs incurred, resulting in a closing balance of zero.

The supervision, control and rating of interim investments made with the Fund is the responsibility of a Monitoring and Control Committee reporting to the MINETUR, previously regulated by Royal Decree 1349/2003 and currently regulated by Royal Decree 102/2014. The Committee must issue reports every six months, detailing the status of the Fund and the investments corresponding to its financial management, as well as the rating of the management of the Fund, making any observations it deems appropriate. These reports are submitted to the Ministry of Industry, Energy and Tourism, the Ministry of the Economy and Competitiveness, and the Ministry for Finance and Public Administrations.

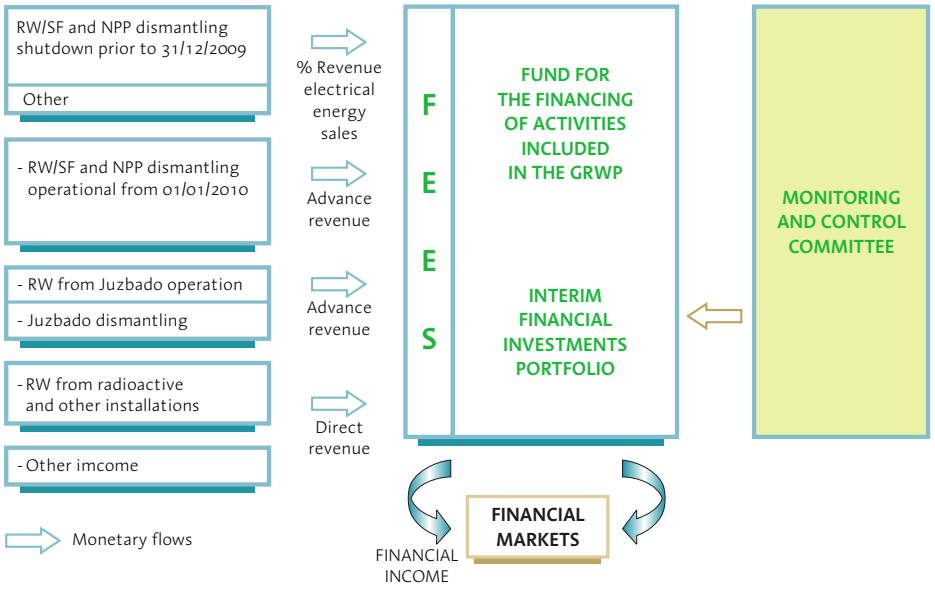
Alongside the activities of this Committee, Royal Decree 102/2014 (previously Royal Decree 1349/2003) sets out that ENRESA must submit the following reports to the Ministry of Industry, Energy and Tourism (responsible for the strategic management and the monitoring and control of ENRESA's technical and economic activities and projects, via the Secretariat of State for Energy):

- ✓ Within the first six months of each year:
  - ➪ a report including technical and economic aspects corresponding to the previous year's activities;
  - ➪ an updated economic and financial study of the cost of the activities set out in the GRWP, including costs for the management of the Plan.
- ✓ Before 30 November of each year, a technical and economic budget justification for the following year, along with the projection for the three following years. In the ex-

ceptional event of the need to cover costs not anticipated in the economic and financial study mentioned above, ENRESA must submit prior corresponding justification.

✓ In the month following each calendar quarter, a budgetary follow-up report.

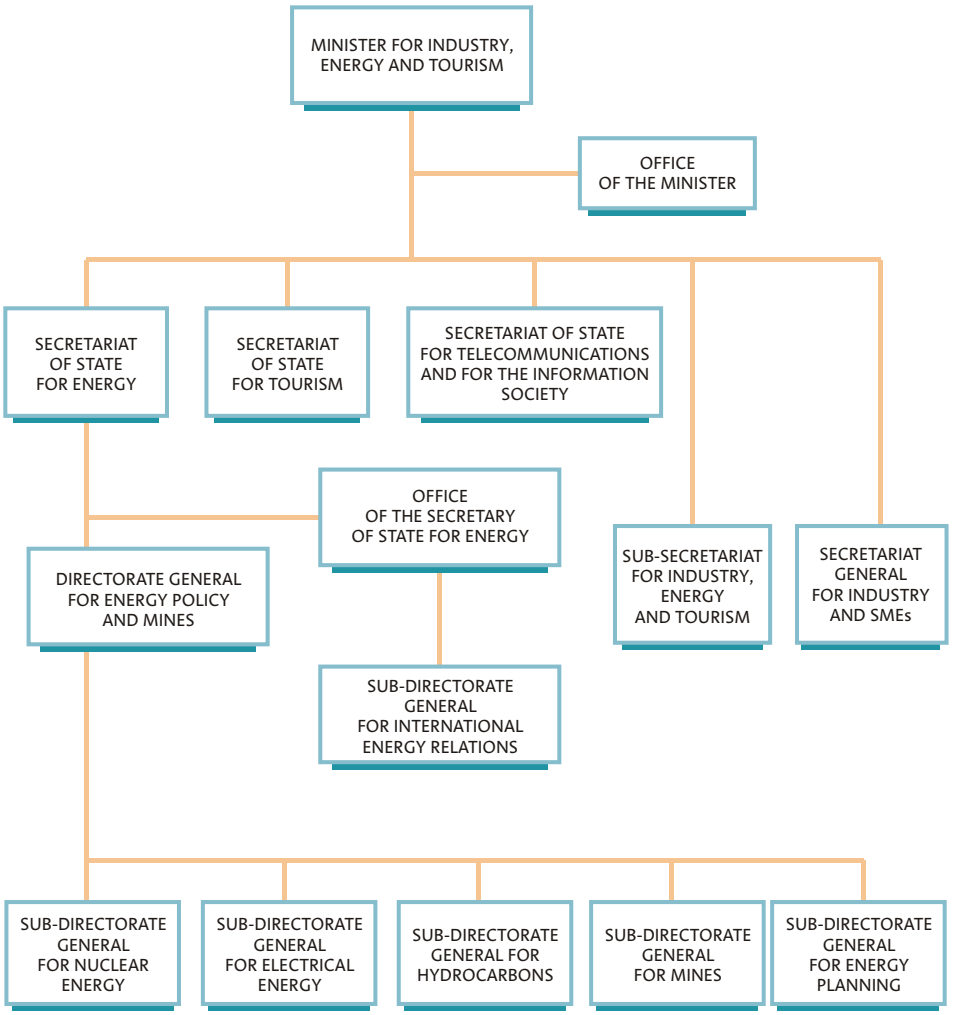
The following diagram provides an overview of the financing system for the activities included in the GRWP and of the mechanisms for its control.



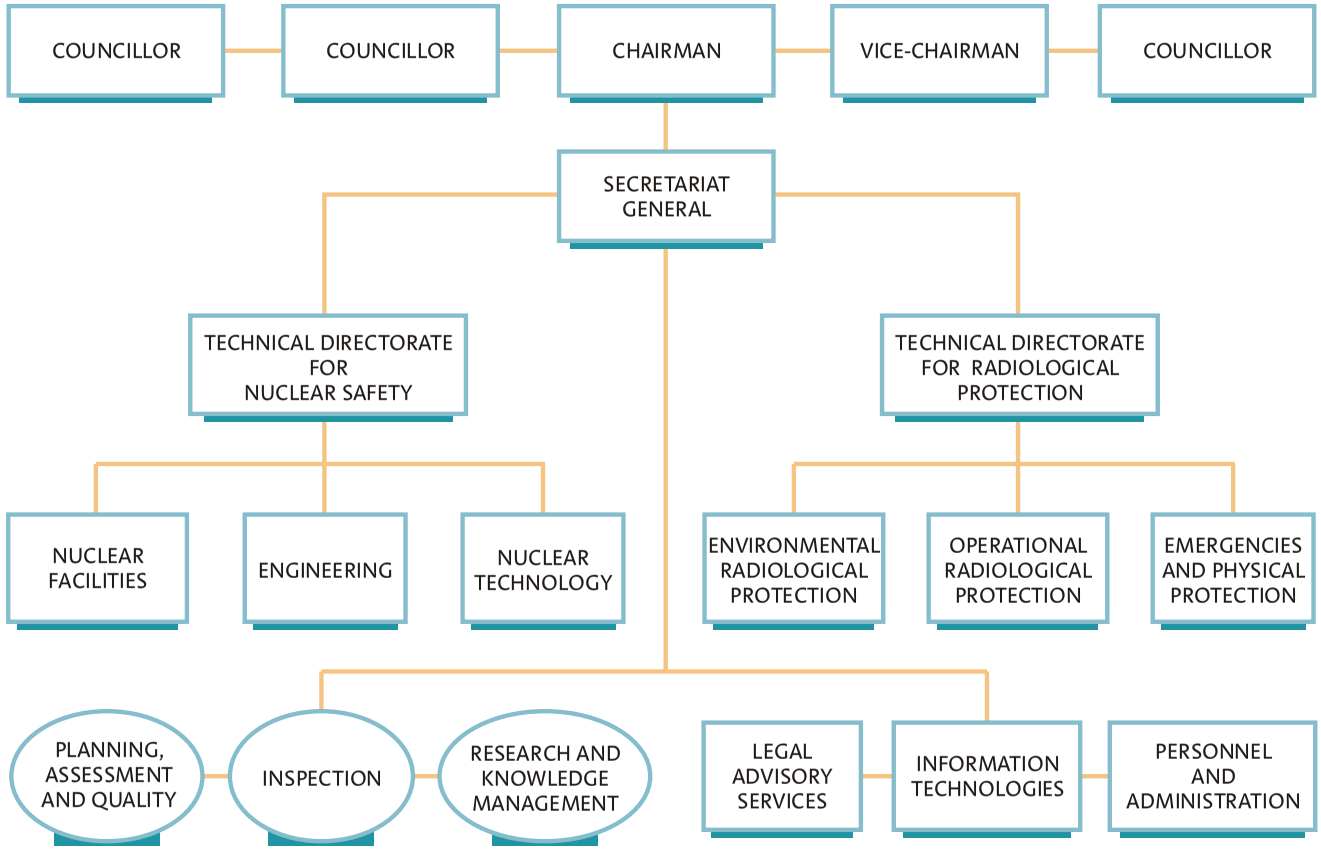
Annex G

Organisational charts of organisations and institutions involved in the management of radioactive waste and spent fuel

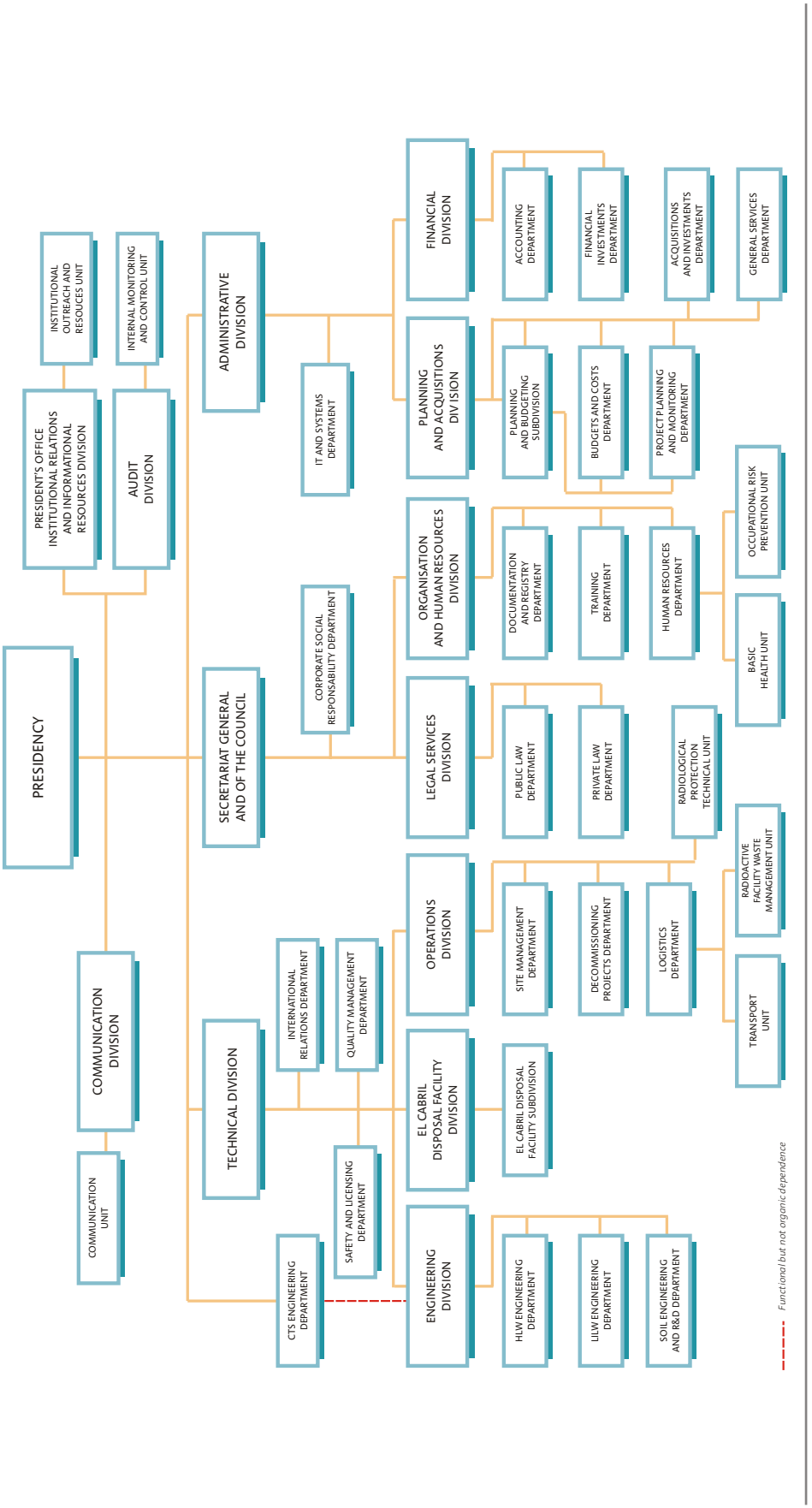
1. Ministry of Industry, Energy and Tourism (MINETUR)



2. The Nuclear Safety Council (CSN)



3. Organisational chart of ENRESA



Annex H

Acronyms and abbreviations used

ALARA	*As Low As Reasonably Achievable*
B.O.E.	*Spanish Official State Gazette*
BWR	*Boiling water reactor*
CFR	*United States Code of Federal Regulations*
CIEMAT	*Centre for Energy-related, Environmental and Technological Research (Centro de Investigaciones Energéticas, Medioambientales y Tecnológicas)*
CSN	*Nuclear Safety Council (Consejo de Seguridad Nuclear)*
CTS	*Centralised Temporary Storage facility*
D.G.	*Directorate General*
DGPC	*Directorate General for Civil Defence and Emergencies (Dirección General de Protección Civil)*
DGPEyM	*Directorate General for Energy Policy and Mines (Dirección General de Política Energética y Minas)*
DGR	*Deep Geological Repository*
EC	*European Community*
ECURIE	*European Community Urgent Radiological Information Exchange*
EEC	*European Economic Community*
EIA	*Environmental Impact Assessment*
ENRESA	*Spanish radioactive waste management agency (Empresa Nacional de Residuos Radiactivos, S.A.)*
ENUSA	*ENUSA Industrias Avanzadas, S.A.*
ERMP	*Environmental Radiological Monitoring Programme*
EURATOM	*European Atomic Energy Community*
FUA	*Andújar Uranium Mill (Fábrica de Uranio de Andujar)*
GRWP	*General Radioactive Waste Plan*
HLW	*High level waste*
IAEA	*International Atomic Energy Agency*
ICRP	*International Commission on Radiological Protection*
INEX	*International Nuclear Emergency Exercises*
INPO	*Institute of Nuclear Power Operations*
IOP	*Operating Instruction*
ISO	*International Organization for Standardization*
JEN	*Nuclear Energy Board (Junta de Energía Nuclear)*
KWU	*Kraftwerk Union A.G.*
LILW	*Low and intermediate level waste*
MARM	*Ministry of the Environment and Rural and Marine Affairs (Ministerio de Medio Ambiente y Medio Rural y Marino)*
MEH	*Ministry of Economy*
MITYC/ MINETUR	*Ministry of Industry, Tourism and Trade (MITYC), currently Ministry of Industry, Energy and Tourism (MINETUR)*
NEA/OECD	*Nuclear Energy Agency of the OECD*

NPP	*Nuclear power plant*
NRC	*US Nuclear Regulatory Commission*
NUREG	*NRC technical publications*
O.M.	*Ministerial Order (Orden Ministerial)*
ODCM	*Off-site Dose Calculation Manual*
OECD	*Organisation for Economic Co-operation and Development*
OJEC	*Official Journal of the European Communities*
OSPAR	*Commission for the protection of the marine environment of the North-east Atlantic*
PACG	*Spent fuel pool (Piscina de almacenamiento de combustible gastado)*
PCD	*Design change package (Paquete de cambio de diseño)*
PCP	*Process control programme (Programa de control de procesos)*
PEN	*National Energy Plan (Plan Energético Nacional)*
PIMIC	*Integrated Plan for the Improvement of the CIEMAT Facilities (Plan Integrado para la Mejora de las Instalaciones del Ciemat)*
PLABEN	*Basic Nuclear Emergency Plan (Plan Básico de Emergencia Nuclear)*
PLAGERR	*Radioactive Waste Management Plan (Plan de Gestión de Residuos Radiactivos)*
PSA	*Preliminary Safety Assessment*
PSR	*Periodic Safety Review*
PWR	*Pressurised water reactor*
R.D.	*Royal Decree (Real Decreto)*
R.G.	*NRC Regulatory Guide*
RF	*Radioactive facility*
RNRF	*Regulation on Nuclear and Radioactive Facilities (Reglamento sobre Instalaciones Nucleares y Radiactivas)*
RPSRI	*Regulation on the Protection of Health against Ionising Radiation (Reglamento sobre Protección Sanitaria contra Radiaciones Ionizantes)*
SA	*Safety Analysis*
SACOP	*Operational Coordination Room (Sala de Coordinación Operativa)*
SALEM	*CSN Emergency Room (Sala de Emergencias del Consejo de Seguridad Nuclear)*
SEPI	*State Industrial Holdings Corporation (Sociedad Española de Participaciones Industriales)*
SF	*Spent fuel*
SG	*Safety Guide*
SGEN	*Sub-Directorate General for Nuclear Energy (Subdirección General de Energía Nuclear)*
SW	*Special waste*
TOS	*Technical Operating Specifications*
UKAEA	*United Kingdom Nuclear Energy Authority*
UNESA	*Spanish Electrical Industry Association (Asociación Española de la Industria Eléctrica)*
UPC	*Polytechnic University of Catalonia (Universidad Politécnica de Cataluña)*
USA	*United States of America*
USNRC	*US Nuclear Regulatory Commission*
VLLW	*Very low level waste*
WANO	*World Association of Nuclear Operators*