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

Fourth Spanish National Report

October 2011

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Section A

Introduction

Section A. Introduction

A.1. PRESENTATION OF REPORT

The present document constitutes the Fourth Spanish National Report, submitted in compliance with the requirements of article 32 of the Joint Convention on Safety in the Management of Spent Fuel and Safety in the Management of Radioactive Waste, done in Vienna on September 5th 1997.

This report will be examined during the review meeting of the Contracting Parties contemplated in article 30 of this Convention, which will begin in May 2012. The Ministry of Industry, Tourism and Trade (MITYC), the Nuclear Safety Council (CSN) and the Spanish radioactive waste management agency Empresa Nacional de Residuos Radiactivos, S.A. (ENRESA) have participated in preparing the report. The report summarises the actions implemented, mainly from January 1st 2008 to June 1st 2011, although the information and data contained therein refer to those available as of December 31st 2010, unless expressly specified otherwise.

The aim is for this report to be not only an explanatory document but also critical and appraising. In this respect, the criteria and directives used in drawing up the report have been as follows:

- ✓ As a starting point, the report has been drawn up taking into account the IAEA document INFCIRC/604 "Directives relating to the form and structure of national reports", adopted by the Contracting Parties pursuant to article 29 of the Convention.
- ✓ Repetitions of the contents of the Third National Report have been avoided to the extent possible and emphasis has been placed on the progress made or novelties arising since that previous report.
- ✓ Consideration has been given to the comments and suggestions emerging during the process of reviewing the previous National Report. Both the reports by the Reporters to the Plenary and the summary report of the third Review Meeting were submitted to the Congressional and Senate Commissions on Industry, Tourism and Trade and to the Institutions concerned.
- ✓ In general, Section K identifies the aspects that it is considered should be improved 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 clarifications have been expressly indicated. For the purposes of agreement with the Spanish standards, in the Spanish version, the term "residuo radiactivo" has preferably been used for radioactive waste, as a synonym of the term "desecho radiactivo" in the meaning given to it in article 2 of this Convention.

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

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

The spent fuel managed in Spain arises from the operation of the eight operating nuclear reactors, located at six sites, and from the operation of the José Cabrera nuclear power plant, which was definitively shut down in 2006. 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 the province of Salamanca, the CIEMAT (Centre for Energy-Related, Environmental and Technological Research) facility in Madrid and the Sierra Albarrana ("El Cabril") solid radioactive waste disposal facility in the province of Córdoba. In addition, radioactive wastes may be generated as a result of the presence of radioactive sources and other materials at installations or in activities not declared within the regulatory system. Section B.3 describes in detail the origin of this fuel and of the wastes.

Spain possesses the infrastructure required for the management of spent fuel and radioactive waste, from the institutional, administrative, technical and economic-financial points of view, and has also established appropriate measures to respond to society's rights to access to information and participation.

From the administrative point of view, the legal and regulatory framework for the management of spent fuel and wastes is integrated in the general framework regulating nuclear energy in Spain, this being a far-reaching framework developed in accordance with the evolution of international regulatory requirements. This framework clearly establishes the responsibilities of the different parties involved, as well as the distribution of functions among the competent authorities responsible for each area, functions that although exercised separately and independently, are integrated in a coordinated fashion within a common administrative framework.

Firstly, and as specifically regards spent fuel and radioactive waste management, the Government is responsible for defining the national policy by approving the General Radioactive Waste Plan (GRWP), in keeping with a proposal by the Ministry of Industry, Tourism and Trade. This Plan, which is periodically revised, contemplates the main courses of action, the timeframe for implementation and the economic and financial estimates for such implementation. Likewise, the management of radioactive waste, including spent fuel, constitutes an essential public service for which the State is responsible, ENRESA being commissioned to manage this public service in accordance with the GRWP. Furthermore, the State will undertake ownership of the radioactive wastes once these have been definitively disposed of.

The basic procedures of the framework regulating nuclear energy, which establish the distribution of administrative functions among the different competent authorities, are as follows:

✓ Authorisation procedure.

The Ministry of Industry, Tourism and Trade (MITYC) is responsible for issuing authorisations for nuclear and radioactive facilities, except in the case of 2nd and 3rd category radioactive facilities[1] when competence has been transferred to the Governments of the Autonomous Communities[2] so requesting. Prior to granting any authorisation for a nuclear or radioactive facility, the MITYC must request reports from all the competent authorities involved. In the specific case of nuclear safety and radiological protection, the report issued by the Nuclear Safety Council, which is mandatory, is binding if rejecting the request and may establish binding limits and conditions if favourable.

The CSN is responsible for the awarding and cancellation of licences and accreditations for the personnel operating nuclear and radioactive facilities, as well as of diplomas for the personnel of radiological protection services or technical units so requiring. The CSN is also responsible for the awarding and cancellation of authorisations for Personal Dosimetry Services, Radiological Protection Services and Radiological Protection Technical Units.

The approval of the Environmental Impact Statement for projects so requiring is the responsibility of the Ministry of the Environment and Rural and Marine.

✓ Legislative procedure.

The Government is responsible for approving the legislative development of laws approved by Parliament, the MITYC currently being the ministerial department in charge of arrangements for and the submittal of legislative proposals in the field of nuclear energy. The drawing up of proposals for regulatory developments relating to nuclear energy is appropriately coordinated between the MITYC and the CSN. When proposals refer to matters potentially affecting nuclear safety or radiological protection, the initiative corresponds to the Nuclear Safety Council, which transfers proposals to the MITYC for proceedings with the Government.

The Nuclear Safety Council is empowered to issue its own standards through the approval of Nuclear Safety Council Instructions, which are technical standards relating to nuclear safety, radiological protection and physical protection integrated in the internal legal regime and binding upon those affected by its scope of application once notified or published in the Official State Gazette. Non-compliance with such instructions is legally typified as an administrative infringement and may be punished under the sanctions regime of the Nuclear Energy Act. The CSN may also issue Complementary Technical Instructions, which are administrative proceedings binding upon those to whom they are addressed and aimed at guaranteeing the maintenance of the safety requirements and conditions of facilities and activities and improved compliance with the requirements established in each authorisation. Finally, the CSN issues Circulars and Guides, these being technical documents of an informative nature and non-binding technical recommendations, respectively.

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

[2] The Spanish State is made up of seventeen Autonomous Communities, whose right to autonomy is contemplated in art. 2 of the Spanish Constitution. The powers and realms of competence of the Autonomous Communities are established in arts. 143 and following articles of the Spanish Constitution.

- ✓ Surveillance and control procedure.

  The review and assessment of nuclear safety and radiological protection at nuclear and radioactive facilities, and the inspection of such facilities, are the sole responsibility of the CSN, as the only competent organisation in relation to nuclear safety and radiological protection.

  As regards other issues, such as security, emergency preparedness or environmental radiological impact, the application of this procedure is carried out in coordination with the organisations of other ministerial departments having competence in each area.

- ✓ Sanctions proceedings.

  The Directorate General for Energy Policy and Mines of the MITYC is responsible for initiating sanctions proceedings against nuclear and radioactive facilities, except 2nd and 3rd category facilities for which competence has been transferred to the Governments of the Autonomous Communities, and for submitting sanctions proposals to the authority determined by the legislation depending on the seriousness of the infringement.

  When infringements refer to issues relating to nuclear safety or radiological protection, the initiative corresponds to the CSN, which proposes the initiation of the corresponding proceedings to the MITYC. As regards security, the CSN may also propose the initiation of sanctions proceedings for infringements against the legislative framework governing nuclear energy.

  In addition, the CSN is legally empowered, under certain circumstances contemplated in the Nuclear Energy Act and alternatively to proposing the initiation of sanctions proceedings to the MITYC, to issue warnings to the licensees, establishing the corrective measures to be implemented by the latter. If the licensee does not respond to the warning, the CSN may impose coercive fines in accordance with the procedure established for this purpose in the legislation.

Section E includes a more detailed description of the legislative and regulatory system.

As regards the technical and economic and financial infrastructure for radioactive waste and spent fuel management, and as has been pointed out above, the Empresa Nacional de Residuos Radiactivos, S.A. (ENRESA) is the company authorised in Spain to provide radioactive waste and spent nuclear fuel storage and disposal, transport and handling services. This company, which is entirely public in nature, was set up by Royal Decree in 1984 and has as its shareholders the Centre for Energy-Related, Environmental and Technological Research (CIEMAT), a national research centre reporting to the Ministry of Science and Innovation, and the Spanish industrial holding company Sociedad Española de Participaciones Industriales (SEPI), which reports to the Ministry of Economy and the Exchequer. ENRESA operates under the aegis of the MITYC, via the Secretariat of State for Energy, which undertakes strategic management and monitoring and control of the company's technical and economic actions and plans.

In addition to spent fuel and radioactive waste management activities and the dismantling of nuclear facilities, ENRESA's functions include the drawing up of the drafts of the successive general radioactive waste plans, which are submitted to the MITYC for review and proceedings before 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 Tracking Committee and the control of the competent economic-financial authorities of the State Administration.

Finally, the waste producers are responsible for the safe operation of their facilities and activities, in all cases in compliance with the requirements of the official documents, for whatever issues might affect the conditions of their authorisations and safety and radiological protection

and, in general, for abiding by the regulations in force. Likewise, the producers are responsible for their facilities under whatever emergency situations might arise.

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

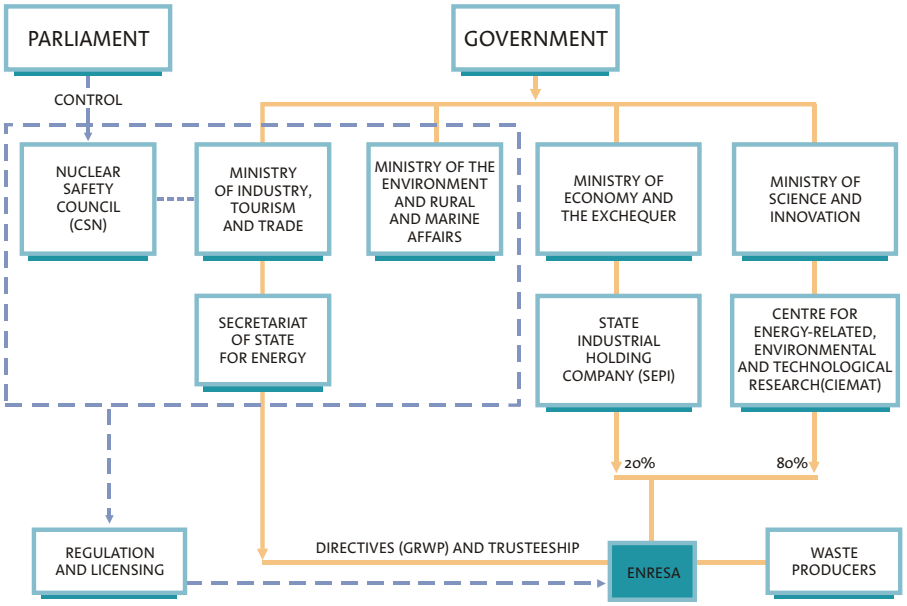

Figure 1. National system.

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

Section K of the Third National Report presented by Spain dealt with a series of initiatives that were on-going at the time of its publication. The status of development of these initiatives was updated during the presentation of the report at the third review meeting of the Convention, as a result of which it was requested that the fourth National Report cover the progress made in legal developments relating to safety in the management of spent fuel and radioactive waste, to the construction of a Centralised Temporary Storage (CTS) facility, to the action plan in response to the conclusions of the IRRS mission in 2008, to continuation of the development of a specific regulatory framework for the clearance of radioactive material and to the legal developments relating to safety in the management of radioactive waste and spent fuel regarding the transboundary tracking and control of radioactive waste.

Although these questions are dealt with in depth in different sections of the present report, the most important examples of progress in these areas, and other developments that have taken

place in the management of radioactive waste and spent fuel, or relating thereto are underlined below:

a) Legislative developments

Within the framework of the commitments acquired by Spain during the 3rd review meeting, special mention might be made of the fact that on October 13th 2010 the Nuclear Safety Council, in application of the power vested in it by Law to "draw up and approve technical instructions, circulars and guides relating to nuclear and radioactive facilities", approved Instruction IS-29 on "Safety criteria for spent fuel and high level radioactive waste temporary storage facilities". The objective of the said Instruction is to "establish the basic safety criteria and requirements to be fulfilled in the design, manufacturing, construction, testing, operation and safety assessment of nuclear facilities for the temporary storage of spent fuel and high level wastes". It is considered that jointly with Instruction IS-20, establishing the safety requirements relating to spent fuel storage casks, approved prior to the aforementioned 3rd review meeting, during which appropriate information on it was provided, this constitutes a basic core of Safety Instructions on the different modes of temporary spent fuel and high level waste storage, both incorporating the "Reference Levels" established by WENRA, on the basis of the applicable safety standards issued by the IAEA.

A measure aimed at increasing safety and also pointed out during the 3rd review meeting was the transposition into the corpus of the Spanish legislation of the European Union Council directive on monitoring and control of shipments of radioactive waste and spent nuclear fuel (Council Directive 2006/117/EURATOM, of November 20th 2006). This transposition was formalised by Royal Decree 243/2009, of February 27th, published on April 2nd 2009, regulating the transboundary surveillance and control of radioactive waste and spent nuclear fuel shipped between member States or transported into or out of the Community (EURATOM). This Royal Decree also includes transposition to the legal framework of the Decision of the European Commission 2008/312/EURATOM, of March 5th, which establishes a uniform document for the surveillance and control of transfers of radioactive waste and spent nuclear fuel, to be used by those applying for authorisation, the corresponding competent authorities and the consignee.

Subsequent to the 3rd review meeting, certain specific articles of the Nuclear Energy Act, Law 25/1964, and the Electricity Industry Act, Law 54/1997, both of which affect Radioactive Waste and Spent Fuel Management, were revised. Thus, the ninth Final Provision of Law 11/2009, of October 26th, contemplates:

i) Creation within the Nuclear Energy Act of a new article entitled "Radioactive Waste Management". This article establishes that "the management of radioactive wastes, including spent nuclear fuel and the dismantling and decommissioning of nuclear facilities, constitutes an essential public service for which the State shall be responsible", and that ENRESA is commissioned to undertake this public service, also indicating that ENRESA is set up as a resource and technical service of the Administration. It is also established that the government shall be responsible for setting out the policy regarding radioactive waste management through the approval of the General Radioactive Waste Plan, and the Ministry of Industry, Tourism and Trade for the tutelage of ENRESA. This new article also establishes that *"The State shall undertake the ownership of radioactive wastes following their definitive disposal"*, as well as whatever institutional surveillance might be required.

ii) Modification of the 6th additional Provision of the Electricity Industry Act, defining key aspects of the Fund for the financing of activities included in the

General Radioactive Waste Plan, such as the creation of a tax to be paid for the Public Service provided by the State, the obligation of the licensees of operating permits to finance all the waste management costs relating to nuclear facilities in operation as of January 1st 2010 and consideration as *"Diversification and Guaranteed Supply Costs"* for amounts set aside for financing of the management of wastes and spent fuel and the dismantling of nuclear facilities definitively shut down prior to January 1st 2010.

The last change in the standards subsequent to the 3rd meeting has been Royal Decree 1440/2010 of November 5th, approving the Charter of the Nuclear Safety Council, into which are incorporated the changes made to the Law Creating the Nuclear Safety Council by Law 33/2007, of November 7th, systematising and harmonising the functions of the Council and transferring the assignment of its administrative powers to a single text.

At European level, the Union Council approved Directive 2009/71/EURATOM, of June 25th 2009, establishing a Community Framework for the Nuclear Safety of Nuclear Installations. It should be pointed out that this Directive does not affect the Sierra Albarrana waste disposal facility, better known as El Cabril.

b) Situation of the Centralised Temporary Fuel Storage (CTS) facility

The State has been carrying out activities aimed at achieving a Centralised Temporary Storage (CTS) facility for fuel, within a framework of transparency and voluntary acceptance by the municipalities. In this respect, a public call was published in the Official State Gazette on December 29th 2009 for the selection of candidate municipalities to house the site of this facility and its associated technology centre. This call was preceded by a White Paper by the Congressional Commission for Industry, Tourism and Trade, urging the Government to set up an Interministerial Commission to establish the criteria to be met by this storage Facility. The said Interministerial Commission having been constituted by Royal Decree 775/2006, of June 23rd, and the "Basic criteria for the siting of the CTS Facility and Associated Technology Centre" having been set out, the aforementioned call was launched; it was addressed to all the municipalities, which were able to respond individually or jointly. The call included a description of the project and a procedure for the selection of the site among the interested municipalities.

Fourteen municipalities responded to the call, although several subsequently withdrew and one did not meet all the requirements, this leaving 8 municipalities to be evaluated by the Interministerial Commission. It should be pointed out that 14,420 allegations were formulated in relation to 9 municipalities.

From the analysis carried out by the Interministerial Commission it may be seen that of the 8 municipalities assessed, two form a homogeneous group attracting the highest evaluation. After receiving the report by the Interministerial Commission, the Government initiated negotiations with the corresponding Regional Governments in a search for the maximum consensus regarding the location of this infrastructure.

c) Measures deriving from the IRRS mission in 2008.

In early 2008, in response to a request by the Spanish Government, an IAEA team visited the Nuclear Safety Council to perform a mission of the Integrated Regulatory Review Service (IRSS). This mission made a total 5 recommendations and 27 suggestions, along with other recommendations and suggestions relating specifically to physical protection. Of the recommendations made, one refers to issues dealt with in this report, as do two of the suggestions. On the one hand, it was recommended that

the CSN collaborate with other competent authorities to stimulate the development and communication of plans for the definitive management of spent fuel and high level radioactive waste. The General Radioactive Waste Plan currently in force contemplates an action plan for the definitive management of high level waste, the temporary storage facility referred to above in point b) being an intermediate step. For its part, the Council submitted a report to Congress in October 2010.

One of the suggestions related to the intervention of the CSN in approval of the General Radioactive Waste Plan. The modification of the Nuclear Energy Act, Law 25/1964, referred to in previous point a) establishes that the Government shall be responsible for establishing the radioactive waste management policy by approving the General Radioactive Waste Plan, which will be submitted to it by the MITYC, following a report by the Nuclear Safety Council.

The other suggestion refers to the way in which a national centralised inventory of radioactive wastes should be regulated; in this respect a working group has been set up between the three affected organisations (MITYC, CSN and ENRESA).

The actions implemented by the CSN as a result of these and other recommendations/suggestions springing from the 2008 IRRS mission were presented in detail to the new IRRS review mission, which took place in January/February 2011. On closure of this mission the coordinator declared: "The CSN has made commendable efforts to progress with the set of issues identified by the IRRS mission in 2008".

d) Continuation of development of the specific legal framework for the clearance of radioactive material.

In 2009, the CSN, in application of the faculty assigned to it by Law to "draw up and approve technical instructions, circulars and guides relating to nuclear and radioactive facilities", initiated the preparation of an Instruction on the radiological control of waste materials generated at nuclear facilities. The Instruction establishes the criteria to be considered for the radiological control of waste materials generated in the controlled zones of nuclear facilities, such that it be possible to determine which are to be subject to processes of declassification, in accordance with the legal framework established.

The Instruction will serve to consolidate the technical process of categorising waste materials, establishing the categories of impacted and non-impacted. Furthermore, it determines the requirements to be considered by the licensee in performing the aforementioned categorisation and for the previous radiological characterisation to which waste materials are to be subjected prior to their declassification, in order to verify that their radioactive content does not exceed the previously established levels.

The Instruction project was submitted in 2010 for comments by all the stakeholders, among them the European Commission, the national and regional institutions, the companies operating the Spanish nuclear facilities, the most relevant technical associations working in the area and the trade union organisations.

The comments received as a result of the process have been analysed by the CSN and have given rise to the publishing of a draft proposal that will shortly be submitted for approval by the Plenary of the CSN and subsequently officially published as a requirement prior to its entry into force.

Section B

Policies and Practices

Section B. Policies and Practices

This section includes the obligations contemplated in Article 32 paragraph 1 of the Convention.

> ***Article 32.1.*** *In compliance with the provisions of article 30, each Contracting Party shall present a national report at each review meeting of the Contracting Parties. The report shall deal with the measures adopted to meet each of the obligations of the Convention. The report from each Contracting Party shall also cover the following:*
>
> *i. Spent fuel management policies;*
>
> *ii. Spent fuel management practices;*
>
> *iii. Radioactive waste management policies;*
>
> *iv. Radioactive waste management practices;*
>
> *v. Criteria used to define and classify radioactive wastes by categories.*

B.1. POLICY AND GENERAL STRATEGY FOR RADIOACTIVE WASTE AND SPENT FUEL MANAGEMENT

Spain possesses a significant infrastructure for the management of spent nuclear fuel and radioactive waste, from the administrative, technical and economic-financial point of view. As regards the administrative side, there is an organisation based on a relatively ample and developed legislative framework. From the technical and economic viewpoints, the strategies and actions to be undertaken in the different areas of radioactive waste management are included in the different General Radioactive Waste Plans (GRWPs), which are official documents in which the Government establishes the general lines of the national radioactive waste and spent fuel policy.

The GRWP is drawn up every four years or whenever required by the Ministry of Industry, Tourism and Trade (MITYC), and constitutes the framework of reference for the national spent fuel and radioactive waste management strategies. As set out in the standards, it must contain:

- ✓ Necessary actions and technical solutions foreseen for the management of radioactive waste and the dismantling and decommissioning of nuclear and, where appropriate, radioactive facilities throughout the timeframe of the Plan.
- ✓ Economic and financial forecasts for the performance of these activities, the timeframe extending to the year 2070.

The GRWP is drawn up by ENRESA and submitted to the MITYC in compliance with the provisions of the standards in force[1]. It is submitted to the Government by the MITYC, which previously requests comments from the Nuclear Safety Council (CSN), the Autonomous Communities, industry and social agents, as well as the general public through its publication on the MITYC website. Following approval by the Government, it is communicated to Parliament. The plan currently in force is the 6th, which was approved by the Cabinet of Ministers on June 23rd 2006.

Within the first six months of each year, ENRESA is required to submit to the MITYC a report on the activities carried out during the previous year, along with an updated economic and financial study of the cost of the activities contemplated in the GRWP. Likewise, before November 30th of each year a technical and economic justification of the budget for the following year must be drawn up, along with the forecast for the three subsequent years.

In order for ENRESA to carry out its activities relating to radioactive waste and spent fuel management, a contractual relationship is established between the company and the waste producers, based on type contracts to be approved by the MITYC and defining the conditions for reception of the wastes by ENRESA. For their part, the producers are required to condition the wastes generated, in accordance with instructions provided by ENRESA and, in the case of dismantling and decommissioning, participate in the plans for the decommissioning and dismantling of their facilities. The term of the contracts must include up to the end of the service lifetime of the facilities, including their dismantling.

ENRESA's activities are set out in Royal Decree 1349/2003, of October 31st, and the Fund for the financing of these activities is regulated in the sixth additional provision of Law 54/1997, as worded in Law 11/2009, partially modified by the 15th Additional Provision of Law 2/2011, the main novelties of which are detailed in Section E of this report. Section F of this report details the method to be used for financing (Article 22.2, entitled "Availability of Financial Resources").

B.2. Classification of radioactive wastes

The definition of radioactive waste is included in the Electricity Industry Act, Law 54/1997, of November 27th:

> *Any waste material or product for which no further use is foreseen and which contains or is contaminated with radionuclides in concentrations or levels of activity in excess of those established by the Ministry of Industry and Energy (currently the Ministry of Industry, Tourism and Trade), following a report by the Nuclear Safety Council.*

The classification of radioactive waste in Spain, from the point of view of its management and in accordance with the criteria adopted by the IAEA[2] and the European Commission[3], contemplates the following categories:

[1] *Arts. 2 and 6 of RD 1349/2003, of 31st October, on the governance of activities performed by the Empresa Nacional de Residuos Radiactivos, S.A. (ENRESA) and their financing. State Official Gazette # 268 of 8 November 2003, starting page 39654.*

[2] *Safety Series No. GSG-1 Classification of radioactive wastes. Safety Guide. (IAEA, Vienna, 2009).*

[3] *Recommendation of the European Commission regarding a system for the classification of solid radioactive wastes, 1999/669/EC, EURATOM; September 15th 1999.*

- ✓ The so-called Low and Intermediate Level Wastes (LILW), which include those 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 integrates those wastes 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 Wastes (VLLW).

- ✓ The so-called High Level Wastes (HLW) are those that contain long-lived alpha emitters with half lives of more than 30 years in appreciable concentrations and that may generate heat as a result of radioactive decay, due to their high specific activity. The main exponent of this type of wastes is the spent fuel (SF) removed from nuclear reactors. Also included, for the purposes of integral management, are those other Intermediate Level wastes (ILW) that in view of their characteristics are not eligible for definitive management under the conditions established for "El Cabril" and that require specific installations for this purpose.

Table 1 shows a classification of radioactive wastes with their respective actual or foreseen management routes.

Table 1.
Classification of radioactive wastes.

Initial Activity	Half Life	
	Short and medium half life Main elements < 30 years	Long Half life Main elements > 30 years
Very Low (VLLW)	Existing surface storage facility: "El Cabril" DISPOSAL FACILITY	"In situ" stabilisation at mining sites
Low and Intermediate (LILW)	Existing surface storage facility: "El Cabril" DISPOSAL FACILITY.	Planned for Centralised Temporary Storage (CTS) facility on the surface.
High (HLW)	In situ storage, including Individual Temporary Storage (ITS) facilities. Planned for Centralised Temporary Storage (CTS) facility on the surface.	

B.3. Generation of spent fuel and radioactive waste

In Spain radioactive wastes are generated at a series of installations distributed across the country, these being the so-called Nuclear Facilities (NF's) and Radioactive Facilities (RF's). Occasionally, wastes may be generated as a result of specific activities (incidents).

The origins of the wastes currently managed are as follows:

- ✓ Operation of nuclear power plants (eight reactors).
- ✓ Operation of the Juzbado Fuel Assembly Manufacturing Facility (Salamanca).
- ✓ Operation of radioactive facilities for industrial, medical, agricultural and research purposes.

- ✓ Occasional incidents.
- ✓ Operation of the "El Cabril" disposal facility.
- ✓ Reprocessing in France of the spent fuel from the Vandellós I nuclear power plant.
- ✓ Dismantling of the Vandellós 1 and José Cabrera nuclear power plants
- ✓ Dismantling of the obsolete and disused installations of the Centre for Energy-Related, Environmental and Technological Research (CIEMAT).
- ✓ Occasional incidents.

In addition to the above, and depending on the management option decided on for the fissile material from reprocessing in Great Britain of the spent fuel from Santa María de Garoña nuclear power plant, sent prior to 1983, this will or will not be considered for management as radioactive waste.

In addition, in Spain important quantities of tailings from uranium mining and the manufacturing of uranium concentrates have been produced (around 75 million tons of mining tailings and some 14 million tons of process tailings), these having low radioactive contents occasionally requiring specific management actions.

With a view to estimating the volumes of wastes expected to be generated as a result of the operation of the current fleet of nuclear facilities, the following reference scenario is contemplated:

1. Current nuclear fleet with six nuclear power plants (8 reactors) and an installed electrical power of 7,862 MWe, as of 31/12/2010.
2. 40 years service lifetime of the operating nuclear power plants, with the exception of Garoña NPP, which is scheduled to cease operation in July 2013 (equivalent to some 42 years).
3. Open fuel cycle; the option of reprocessing spent fuel is not contemplated.
4. Complete dismantling strategy (Level 3) for the light water nuclear power plants, to be initiated 3 years after definitive shutdown. In the case of Vandellós 1 NPP, complete dismantling on completion of the dormancy period.

According to the estimates as of 31/12/2010, the total volume of radioactive wastes to be managed in Spain, already conditioned and susceptible to being definitively disposed of at the "El Cabril" Disposal Facility, amounts to some 173,000 m^3 LILW, 52% of which might specifically be managed as VLLW.

The total volume of wastes not eligible for definitive disposal at "El Cabril" would amount, once encapsulated, to some 13,000 m^3, of which some 10,000m^3 would be spent fuel (equivalent to 6,700 tU) and the rest intermediate or high level wastes from reprocessing or the dismantling of nuclear power plants.

Of this quantity, the wastes arising from the reprocessing in France of the spent fuel from Vandellós I nuclear power plant are currently in storage at overseas installations. In this respect, 13 m^3 of vitrified high level wastes and 670 m^3 of intermediate level wastes of different types are currently pending return to Spain, along with the fissile material from the reprocessing of fuel from Santa María de Garoña nuclear power plant, where appropriate.

Figure 2 shows the forecast for the production of radioactive wastes in Spain.

The structure of the total volumes of VLLW/LILW to be managed in Spain is presented In Figure 3, by origins, with consideration given only to those that exceed 1%.

As regards mining tailings, there are currently no installations in operation in Spain, some being in the restoration phase and others already restored. A detailed view of the tailings and concentrates associated with each installation may be found in Section D (Inventories and lists).

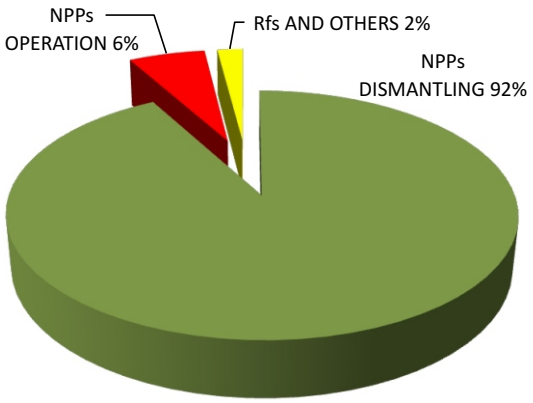

Figure 2. Radioactive waste generation in Spain.

B.4. Spent fuel management policies and practices

The GRWP currently in force makes a clear distinction between spent fuel and high level radioactive waste and establishes that, as regards spent fuel, open cycle management is contemplated as the basic option.

B.4.1. Temporary storage

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

The spent fuel from the light water reactor plants belonging to the Spanish nuclear fleet is currently stored in the pools of the corresponding plants. In view of the forthcoming saturation of the storage capacity of these pools, throughout the nineteen nineties the original racks were progressively replaced with other more compact units, this having allowed the need to provide a storage capacity additional to the pools to be significantly deferred in most cases.

Certain of the Spanish nuclear power plants, however, already have Individualised Temporary Storage (ITS) facilities as an alternative or complement to storage in the plant pools:

- ✓ In view of the intrinsic characteristics of its design, the Trillo nuclear power plant was the first to have an installation of this type, constructed on the plant site. At this dry storage facility, which has been in operation since 2002, the spent fuel is stored in metallic casks.
- ✓ The José Cabrera nuclear power plant, which was definitively shut down on April 30th 2006, also has an ITS facility on site, the operating permit for which was granted in March 2008. During the period from January to September 2009 all the spent fuel generated during the operation of the plant (377 assemblies in 12 casks) was transferred to the ITS facility as a step previous to the authorisation for the

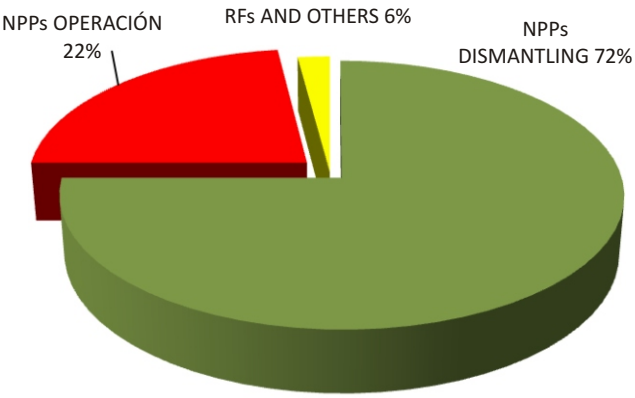

Figure 3. Low and Intermediate Level Wastes (LILW/VLLW).

transfer of ownership to ENRESA and the beginning of dismantling, authorised by Ministerial Order ITC/204/2010, of February 1st, by the Ministry of Industry, Tourism and Trade. Signing of the transfer of ownership took place on February 11th 2010.

✓ As saturation of the fuel pools at Ascó nuclear power plant is foreseen in 2013 (group 1) and 2015 (group 2), construction of an ITS facility is planned on the site. As in the previous cases, the licensing process will consist of the approval of the design of the cask, in accordance with article 80 of the Regulation on Nuclear and

Figure 4. Location of plants, reactors and facilities.

Radioactive Facilities (RNRF), this already having been accomplished, and authorisation for modification of the plant, for the construction and operation of the ITS facility (in accordance with article 25 of the RNRF). The Ascó ITS licensing process is described in detail in article 6.1 of Section G of this report.

The characteristics of the aforementioned installations are detailed in Section D.1 of this report.

The basic strategy contemplated in the GRWP to have available an additional capacity for the temporary storage of spent fuel focuses on the construction of a Centralised Temporary Storage (CTS) facility, which would house the spent fuel and HLW under dry storage conditions. This solution is backed by the following considerations:

- ✓ It allows management to be addressed under optimum conditions and in a unified manner for all the SF, HLW and ILW, while keeping temporary and definitive management independent.
- ✓ It provides the Spanish management system with the capacity to manoeuvre in response to possible unforeseen circumstances that might arise in the future, such as the need for the premature dismantling of a plant.
- ✓ It reduces the number of SF, HLW and ILW storage facilities in Spain, and consequently the dispersal of nuclear sites across the country, with the corresponding reduction of the risks and burdens associated with this type of installations. This reduction would become more significant with time and is particularly important in relation to the security of the facility.
- ✓ It allows the decommissioned nuclear installations to be released for other unrestricted uses.
- ✓ It allows for compliance with the clauses on the return of wastes and materials from the reprocessing of SF abroad.
- ✓ From the economic point of view, it implies a highly significant reduction of the overall cost of the HLW and ILW temporary management system, compared to the option of storage at each plant and other necessary temporary storage facilities.
- ✓ It allows the operation of and support services for the facility to be rationalised and optimised.

The site on which the facility would be located does not require any special characteristics, as a result of which the detailed design of the installation may be adapted to a large number of potential sites within the Spanish geography. Section G, paragraph 6.1, entitled Plans for new SF facilities, describes the solution proposed for the aforementioned CTS installation.

B.4.2. Final management

As regards the final management of spent fuel and high level waste, it should be pointed out that Spain has been working since 1985 on the study of different options for definitive disposal at depth, in accordance with four basic courses of action:

- ✓ Site Selection Plan (SSP), carried out until 1996. This plan has provided sufficient information to be able to conclude that there are abundant granitic, clay and – to a lesser extent – saline formations in the Spanish subsoil capable of housing a definitive disposal facility. Furthermore, the existence of widely distributed and potentially valid locations has been identified.
- ✓ Development of conceptual designs for a definitive disposal facility in each of the aforementioned lithologies, seeking maximum convergence between them.

- ✓ Performance of safety assessment exercises on the conceptual designs, integrating the know-how acquired from the tasks and projects carried out on the basis of the successive ENRESA R&D plans, which have demonstrated that geological disposal allows for compliance with the safety and quality criteria applicable to this type of facilities.
- ✓ The ENRESA R&D plans have evolved and have adapted to the Spanish SF/HLW management programme. These plans have made it possible to acquire technical knowledge and set up national working teams for development of the definitive disposal option.

The current GRWP indicates that work will continue on the consolidation and updating of the knowledge acquired, with advantage taken of international developments in this area.

B.5. Radioactive waste management policies and practices

Given that long-lived HLW has been dealt with in previous sections relating to spent fuel, this section will refer only to the management policy for low and intermediate level wastes (LILW).

In Spain, LILW is produced in different regulated activities and at different regulated facilities (nuclear and radioactive) using radioactive substances or materials. It may also be occasionally necessary to manage wastes arising from facilities that do not require any authorisation within the framework of the nuclear energy legislation (such as steelyards and metal recycling plants). For these last cases, suitable mechanisms have been put in place to recover control over radioactive materials and guarantee their safe management as wastes when they arise.

As of today it may be stated that Spain has solved the overall issue of managing the LILW that it is estimated will be produced within the timeframe of the GRWP, since it possesses an integrated management system with the necessary capacities and configured on the basis of the activities of a series of clearly identified agents operating in a structured manner and in accordance with the directives drawn up by ENRESA.

Within this system, the nuclear facilities possess waste treatment capabilities for conditioning at the plants themselves in accordance with the waste acceptance specifications applied by ENRESA for the "El Cabril" disposal facility. In other cases the producers deliver their wastes to ENRESA in the form agreed on and the latter 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, although it also has various other technological capabilities, such as treatment and conditioning installations for the processing of wastes from radioactive facilities and of those removed from non-regulated installations. Certain complementary treatments are also carried out on wastes from nuclear facilities. The "El Cabril" facility also has waste characterisation and verification laboratories, which are the basis for the performance of the tests foreseen for the acceptance of different waste types and the verification of their characteristics, as well as the workshops, laboratories and other auxiliary systems required for its operation.

The experience accumulated in Spain in LILW management has made it possible to identify areas for improvement and define the most suitable actions to address their optimisation, interven-

ing on those elements of the system that most require it at the time or that lead to the greatest increase in operability.

In the wake of the efforts made in recent years to improve waste management, the most representative example of which has been the reduction to less than one third of the volume of operating LILW to be managed, from both nuclear power plants and radioactive facilities, new improvements are mapped out for the future, to be applied in coordination with the waste producers, and efforts are to be made in innovation and research into treatment techniques reducing waste volumes. Emphasis is foreseen also on the complementary development of decontamination and measuring techniques.

Mention should be made of the recent entry into operation of the systems implemented at "El Cabril" for the treatment of contaminated aggregates, generated basically as a result of incidents in the metal industry, through their immobilisation in the containers normally used for the reconditioning of the drums received from nuclear facilities.

The forecasts of the current GRWP contemplate the generation over the coming years of a considerable volume of radioactive waste with very low levels of radioactivity (VLLW), fundamentally from the dismantling of nuclear facilities. In this respect, since 2008 the "El Cabril" facility has had a specific area for the disposal of very low level wastes, consisting of a cell with a storage capacity for approximately 30,000 m^3, to which will be added in the future a further three cells, up to the full authorised capacity of 130,000 m^3.

As regards improvement of the capacities of "El Cabril" and the availability of resources to address future situations, the operation of the new "auxiliary conditioning building" is particularly significant. This has been designed to house LILW characterisation and decontamination techniques or the new waste treatment systems that might be necessary in the future. Also contemplated is a new facility for disused radioactive sources, more operative than the installation currently existing.

Consequently, the basic axes of the LILW management improvement activities are as follows:

- ✓ Coordination of efforts to minimise waste generation and volumes and to optimise the occupation of the volume available at "El Cabril".
- ✓ Management of VLLW at a complementary facility specifically designed for this sub-category of wastes, as part of the "El Cabril" installation.
- ✓ On-going improvement of knowledge of the waste and regarding methods and techniques relating to the performance of the disposal system and safety assessment.
- ✓ Improvement of the technological capacities available, with a view to optimising the aforementioned processes and making them more flexible, as well as for the preparation of resources to address future situations.

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Section C

Scope of Application

Section C. Scope of Application

This section deals with the requirements included in article 3 of the Convention on the scope of application.

Art. 3: Scope of application

1. *This Convention shall be applicable to safety in the management of spent fuel when the said spent fuel is from the operation of nuclear reactors for civil purposes. Spent fuel located at reprocessing facilities as part of a reprocessing activity shall not be included within the scope of this Convention unless the Contracting Party were to declare that the reprocessing is part of spent fuel management.*
2. *This Convention shall be applicable also to safety in the management of radioactive waste when such waste arises from civil applications. This Convention shall not, however, be applicable to wastes containing only natural radioactive materials not having their origin in the nuclear fuel cycle, unless constituted by disused sealed sources or defined by the Contracting Party as radioactive waste for the purposes of this Convention.*
3. *This Convention shall not be applicable to safety in the management of spent fuel or radioactive wastes forming part of military or defence programmes, unless the Contracting Party declares them to be spent fuel or radioactive wastes for the purposes of this Convention. Notwithstanding the above, this Convention shall be applicable to safety in the management of spent fuel and radioactive wastes deriving from military or defence programmes when such materials are transferred permanently to and managed within exclusively civil programmes.*
4. *This Convention shall also be applicable to discharges, as stipulated in articles 4, 7, 11, 14, 24 and 26.*

In Spain the scope of application of the Convention shall extend to the following:

- ✓ Spent nuclear fuel from the operation of nuclear power plants and research and training reactors.
- ✓ Radioactive wastes from the nuclear fuel cycle, as well as wastes 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 milling facilities.
- ✓ Discharges from nuclear and radioactive facilities.

In the past certain quantities of spent fuel have been sent abroad for reprocessing; the different products that are to be returned to Spain shall also be included in the scope of application.

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Section D

Inventories and Lists

Section D. Inventories and Lists

Art. 32. Submittal of reports

(…)

2. This report shall also include the following:

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

ii) An inventory of spent fuel regulated by this Convention, both that in storage and that disposed of. This inventory shall contain a description of the materials and, were it to exist, information on their mass and total activity;

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

iv) An inventory of the radioactive waste regulated by this Convention, as follows:

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

b. Wastes finally disposed of, or

c. Wastes deriving from previous practices.

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

v) A list of nuclear facilities in the decommissioning phase and the situation of the decommissioning activities at these facilities.

D.1. Spent fuel management facilities

Spent nuclear fuel is currently stored in the pools of the nuclear power plants, except in the cases of the Trillo and José Cabrera plants. At the first of these the pool system is complemented with metallic casks housed in a dry storage facility. At José Cabrera, following the definitive shutdown of the plant and initiation of preparatory tasks for dismantling, the spent fuel was transferred to an independent temporary storage facility on the plant site for dry storage in metal-concrete type casks.

Table 2 includes the existing facilities.

Table 2.
Existing facilities.

Name of Facility	Location (Province)	Type of storage
Almaraz I NUCLEAR PLANT	Cáceres	Pool
Almaraz II NUCLEAR PLANT	Cáceres	Pool
Vandellós II NUCLEAR PLANT	Tarragona	Pool
Ascó I NUCLEAR PLANT	Tarragona	Pool
Ascó II NUCLEAR PLANT	Tarragona	Pool
Cofrentes NUCLEAR PLANT	Valencia	Pool
Sta. M. Garoña NUCLEAR PLANT	Burgos	Pool
Trillo NUCLEAR PLANT	Guadalajara	Pool
		Dry storage
José Cabrera NUCLEAR PLANT	Guadalajara	Dry storage

✓ Pools

The nuclear power plant storage pools are located in the reactor building at the Trillo and Santa María de Garoña plants. In the rest of the operating plants the pools are located in a building annexed to the containment and connected to it by means of the transfer channel. When there are two reactors on one same site – this being the case at Almaraz and Ascó – each group has its own pool. In the case of the Cofrentes nuclear power plant there is a second pool inside the reactor building which is used for the temporary storage of the fuel during refuelling outages.

The spent fuel storage pools whose initial capacity has been increased by re-racking with high density units have a reserve capacity for a complete reactor core if this were necessary, this being a requirement for nuclear power plant operation.

In relation to the Third National Report, the extension of the capacity of the storage pool at Cofrentes, by replacing the previous storage racks with other high density units (re-racking) has now been completed, with which the storage capacity has been increased by almost 30%.

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

a) Trillo nuclear power plant

The Trillo nuclear power plant cask storage facility has been in operation since 2002. It is a rectangular base surface installation with a capacity for 80 ENSA-DPT casks. The interior of the facility is divided into two clearly differentiated areas by a shielding wall: the storage area and the access area. The casks are arranged vertically in the first of these areas. In the second are the services required for operation of the facility (loading and unloading installations, maintenance, access control, etc.). The facility is designed as a passive building, ensuring that the functions of the casks are not affected.

The metal ENSA-DPT cask has been designed for the safe storage and transport of 21 Kraftwerk Union (KWU) light water PWR reactor 16x16-20 fuel assemblies. Its design fulfils the requirements of 10 CFR 72, the IAEA Regulation on the safe transport of radioactive substances and the Spanish transport regulations.

b) José Cabrera nuclear power plant

The José Cabrera nuclear power plant was definitively shut down in April 2006. The alternative chosen has been immediate complete dismantling, such that the site might be fully released for use without any type of restriction. As a preliminary step the spent fuel stored in the pool has been transferred to a temporary dry storage facility constructed on the plant site.

The system selected is made up of three clearly differentiated elements: a multi-purpose metal capsule with a capacity for 32 fuel assemblies and constituting a hermetically sealed confinement barrier, a storage module (concrete-steel hybrid) housing the capsule for long-term storage and a transfer container used for capsule loading, unloading and transfer operations. The system is completed with the transport cask for the future transport of the loaded capsule to the facility in which the next stage of management will be carried out.

The temporary storage facility is an outdoor installation linked to the plant by an access road for the transfer of the loaded storage modules by means of a special vehicle for this task. The installation consists basically of a reinforced concrete slab on which will be placed vertically the 12 modules required to house the 377 fuel elements from the plant. A design modification is currently being licensed for the housing of four new casks with vessel internals and other radioactive wastes not eligible for storage at El Cabril. The facility is equipped with a double security fence and a fence bounding the free access zone. Authorisation for start-up was granted in March 2008.

D.2. Spent fuel inventory

The total amounts of spent fuel existing in Spain as of December 31st 2010 are shown in Table 3.

D.3. Radioactive waste management facilities

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

> *A "radioactive waste management facility" is understood as being any unit or installation whose main purpose is the management of radioactive wastes, including nuclear facilities in the process of decommissioning only if designated by the Contracting Party as radioactive waste management facilities;*

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

Table 3.
Spent Fuel Inventory.

Name of facility	Types of fuel assemblies	Total capacity/ reserve core (No of assemblies)	SF in storage (No of assemblies)	SF in storage (tU)
Almaraz I NUCLEAR PLANT	PWR 17x17	1804/157	1204	558
Almaraz II NUCLEAR PLANT	PWR 17x17	1804/157	1192	553
Vandellós II NUCLEAR PLANT	PWR 17x17	1594/157	908	421
Ascó I NUCLEAR PLANT	PWR 17x17	1421/157	1100	510
Ascó II NUCLEAR PLANT	PWR 17x17	1421/157	1080	501
Cofrentes NUCLEAR PLANT	BWR 8x8, 9x9, 10X10	5404/624	3468	645
Sta. M. Garoña NUCLEAR PLANT	BWR 8x8, 9x9, 10X10	2609/400	1985	347
José Cabrera NUCLEAR PLANT	PWR 14x14		377	100(1)
Trillo NUCLEAR PLANT	PWR 16x16	805/177	516	244
		ITS facility with capacity for 80 casks, each containing 21 assemblies	420	199(1)

(1) Dry storage

✓ **Operating nuclear power plants.**

All the nuclear power plants have installations for the treatment of their liquid wastes and conditioning of solid wastes: pre-compacting and immobilisation. There are also temporary storage installations at each plant for holding of the wastes prior to their transfer to the "El Cabril" LILW disposal facility.

✓ **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 the low and intermediate level wastes generated during the process of dismantling, this being an intermediate and specific solution for the graphite wastes from fuel assembly sleeves that cannot be managed at "El Cabril".

✓ **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 wastes resulting from certain currently on-going decontamination tasks are treated at these installations and temporarily stored at the plant prior to being shipped to "El Cabril".

✓ **Juzbado fuel manufacturing facility**

Like the nuclear power plants, this facility has a plant for the treatment of its liquid wastes, by desiccation and immobilisation in cement. For the pre-conditioning of its solid wastes the facility uses pre-compacting and for final conditioning immobilisation in cement. The existing temporary storage facility serves as an intermediate stage prior to transport of the wastes 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 the solid low and intermediate level wastes generated at the Centre and for the provisional storage of sources and other radioactive materials in transport packages meeting the requirements established in the national Regulation on the road transport of hazardous goods.

CIEMAT treats and conditions wastes arising from the research activities carried out at the Centre, relating fundamentally to developments for radioactive waste management, the tracking of materials and other activities involving the use of tracers and radioactive materials.

During the period covered by this Fourth National Report, CIEMAT has extended its temporary storage capacities in order to be able to store very low level or declassifiable wastes arising from performance of the PIMIC-Rehabilitation project (see section D.5.), by authorising the use of previously existing buildings especially conditioned for this application.

✓ **"El Cabril" low and intermediate level waste disposal facility**

The "El Cabril" disposal facility has treatment and conditioning systems for solid and liquid wastes. These systems are used to treat and condition all the wastes requiring such interventions prior to their disposal at the facility. In view of the policy defined in the General Radioactive Waste Plans, most of the wastes treated and conditioned at "El Cabril" come from radioactive facilities or are generated at this centre itself, although the installation also has the systems required for the final conditioning of wastes from nuclear facilities prior to their final incorporation in the disposal cells.

A) Low and intermediate level waste

➪ Treatment and conditioning of wastes from radioactive facilities.

The wastes generated by the minor producers (radioactive facilities for industrial, medical, agricultural and research purposes) are segregated by them at their installations and subsequently transported to "El Cabril". The transfer of the wastes is undertaken in accordance with a removal agreement between the producer and ENRESA, which adheres to the system of waste categories established by the MITYC. Treatment of the different types of wastes at the "El Cabril" facility is performed in such a way as to minimise the production of secondary wastes and to obtain final solid products meeting the necessary long-term stability conditions.

"El Cabril" is equipped with an area for the conditioning of wastes from minor producers, in which there is a glove box for emptying of the containment units, a pre-compacting unit for compactable wastes not implying any biological risk, an incinerator for decomposable solids, solids with biological risk, scintillation liquids, oils and solvents, and an area for the immobilisation of the final wastes produced by these treatments and the direct immobilisation of radioactive sources, hypodermic needles and cutting solids.

Furthermore, in view of the existence of wastes from incidents at steelyards, systems have been installed for the conditioning of such wastes.

- Final conditioning wastes from major producers.

  The major producers (nuclear power plants and fuel assembly manufacturing facility) are required to condition their low and intermediate level wastes in packages meeting the ENRESA acceptance criteria for transport to the "El Cabril" facility, and these wastes are conditioned in such a way as to not require subsequent treatment processes.

  There is also a second category made up of waste packages that have been pre-compacted at their place of origin due to their physical characteristics. The "El Cabril" facility has a drum compacting unit with a capacity of 1200 t, capable of achieving volume reductions of around 3 on average. The compacted wastes are conditioned in containers for final disposal.

- Temporary storage at the "El Cabril" facility.

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

- Definitive disposal at the "El Cabril" facility.

  The low and intermediate level waste disposal system at "El Cabril" is of the shallow type in disposal cells. There are currently 28 disposal cells. The conditioned waste packages are transferred to disposal containers which, once complete, are filled with mortar. Once this process is completed, the containers are transported to the disposal platform and placed in the cells.

B) Very low level waste (VLLW)

Since 2008, the "El Cabril" facility has had a specific very low level waste disposal area, consisting of an initial cell with a disposal capacity of some 30,000m^3. The cell is a pit excavated in the ground over which a series of drainage or waterproofing layers have been arranged to prevent the possible dispersion of leachates in the medium. The aim in the future, when this cell is full, is to construct a further three until the authorised capacity of 130,000m3 is completed. In this way it will be possible to definitively dispose of the contaminated materials arising especially from the dismantling of facilities, the specific activity of which is hundreds of times lower than that of the low and intermediate level wastes currently disposed of in the other area of "El Cabril".

The very low level wastes arrive at "El Cabril" in drums, sacks or metallic containers and are either sent directly to the cell or temporarily deposited in the Technology Building. The latter is equipped with systems for stabilisation by means of inertisation or for optimisation of volume, depending on the treatment required by the different types of wastes arriving.

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

Table 4.
Radioactive waste management facilities.

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

D.4. Radioactive waste inventory

Table 5 shows the inventory of radioactive wastes as of December 31st 2010.

D.5. Facilities in the decommissioning phase

✓ **Vandellós 1 nuclear power plant.**

The Vandellós 1 nuclear power plant operated from 1972 until October 1989, when it suffered an accident in its conventional part. This French technology plant was the only graphite-gas unit built in Spain. In 1992, following the definitive suspension of its operating permit, the Ministry of Industry and Energy accepted the dismantling alternative proposed by ENRESA. The Plan consisted of partially dismantling 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 in June 2003, it was not until January 2005 that the dormancy period began, following the issuing of the corresponding Ministerial Resolution by the Directorate General for Energy Policy and Mines. During this dormancy period the surveillance and control activities required for dismantling to Level 3, on completion of this waiting period, will be carried out.

✓ **José Cabrera nuclear power plant**

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

As has been pointed out above, the Spanish standards currently in force establish that the responsibility for planning and performing the dismantling of nuclear power plants falls directly to the Empresa Nacional de Residuos Radiactivos, S. A. (ENRESA), which is also responsible for the definitive management of the spent nuclear fuel and radioactive wastes generated at these facilities. For this reason, the Ministerial Order of February 1st 2010 also establishes that the licensee of the plant dismantling activities is ENRESA, as a result of which it has been necessary to undertake a process of switching ownership of the facility from Gas Natural to ENRESA, this culminating on February 11th 2010, as from which date the dismantling of the facility began.

In accordance with the policy set out in the 6th GRWP, José Cabrera nuclear power plant is being dismantled to IAEA Level 3 with a view to the site being released for use of any type.

As has been pointed out in previous section D.1., the spent fuel is currently in storage in an individualised temporary storage facility on the plant site.

Table 5.
Radioactive waste inventory.

Name of facility	Type of facility	Type of waste	Volume (m^3)	Main radionuclides
Almaraz I-II NPP	NPP	VLLW	408	Co-60, Cs-137
		LILW	1,240	
Vandellós II NPP	NPP	VLLW	46	Co-60, Cs-137
		LILW	181	
Ascó I-II NPP	NPP	VLLW	185	Co-60, Cs-137
		LILW	445	
Cofrentes NPP	NPP	VLLW	772	Co-60, Cs-137
		LILW	1,094	
Sta. M. Garoña NPP	NPP	VLLW	22	Co-60, Cs-137
		LILW	875	
Trillo NPP	NPP	VLLW	66	Co-60, Cs-137
		LILW	68	
José Cabrera NPP	NPP	VLLW	306	Co-60, Cs-137
		LILW	150	
Vandellós I NPP	NPP	VLLW	1,372	Co-60, Ni-63
		LILW	59	
		HLW	2,682	
Juzbado	Fuel assembly manufacturing facility	VLLW	203	U-234,U-235,U-238
		LILW	333	
CIEMAT	Research centre	VLLW	644	Co-60, Cs-137
		LILW	89	
El Cabril	Temporary storage	VLLW	218	Co-60, Cs-137
		LILW	2,405	
	Disposal	VLLW	2,087	
		LILW	27,302	

LILW disposal: Equivalent to 67,515 m3 occupied by the 6,062 positions in the cells (5,706 CE2A containers and 256 racks).

✓ **CIEMAT installations**

The Integrated Plan for the Improvement of the CIEMAT Installations (PIMIC) consists of dismantling certain obsolete installations for which no further use is foreseen and of using the spaces released for the performance of other activities. The Plan, in which work will continue until 2013, is controlled and supervised by the CSN and the MITYC. During its performance, CIEMAT will continue to be the responsible licensee of the facility and will provide the necessary support.

The PIMIC began with the tasks of preparing the site, including the auxiliary installations required for the performance of dismantling and rehabilitation activities. The period 2006-2010 has included equipment and system disassembly activities, decontamination, declassification and restoration of the different installations and terrains.

The main installations affected by the PIMIC are the JEN-1 experimental reactor and the irradiated fuel reprocessing pilot plant, currently completely dismantled and in the decontamination phase. Other elements also in the dismantling phase are the liquid radioactive waste storage and conditioning plants, the research reactor fuel assembly development plant (completely dismantled and in the phase of administrative decommissioning), the metallurgical hot cells and the radionuclide metrology laboratory, all of these also fully involved in the process of rehabilitation and dismantling.

The PIMIC also contemplates the cleaning and restoration of certain terrains affected by operational contamination incidents.

✓ **Saelices el Chico mining facilities.**

The work carried out includes the dismantling of the Elefante uranium concentrates manufacturing plant and the restoration of the mining facilities of the FE and D deposits that until the end of 2000 fed the ENUSA Quercus uranium concentrates manufacturing plant, which is now definitively shut down.

✓ **Andújar Uranium Mill.**

The surveillance tasks continue at the site of the Andújar Uranium Mill (AUM), in accordance with the requirements established in the set of conditions issued by the CSN, contemplated in the Resolution of the Ministry of Industry and Energy of March 17th 1995.

✓ **Disused uranium mining installations restoration plan**

The set of activities included in this Plan contemplated the restoration of 24 sites on which mining activities had been carried out.

The project was approved by the Ministry of Industry and Energy in 1997, following a favourable report from the CSN and the corresponding autonomous community, provincial and local administrations. Work began in November 1997 and was completed in March 2000. This was directed by ENRESA and performed by ENUSA.

Furthermore, in 2007 ENUSA completed a new restoration project at two other disused uranium mines, operated in their day by the former Nuclear Energy Board (JEN), on which work had begun in 2006.

Table 6.
Facilities in the dismantling phase.

Facilities in dismantling				
Programme	**Name**	**Location**	**Status**	**Performance**
Vandellós I NUCLEAR POWER PLANT dismantling project	Vandellós I	Vandellós, Tarragona	Dormancy (Dismantled to Level 2)	1998 - 2004
Integrated Plan for Improvement of CIEMAT Installations	CIEMAT	Madrid	Performance being completed	2004-2013
Saelices el Chico installations dismantling and restoration plan	Elefante and Fé and D mines facilities	Saelices el Chico	Facilities dismantled, restoration work in progress	2001- 2009
José Cabrera NUCLEAR POWER PLANT dismantling project	José Cabrera NUCLEAR PLANT	Zorita de los Canes Guadalajara	Performance of Dismantling and Decommissioning Plan	2010-2016

D.6. Decommissioned facilities

During the period between the 3rd National Report and the current report no decommissioning statements have been issued for any facility, as a result of which the situation of the decommissioned facilities included in tables 7 and 8 of the 3rd National Report remains unchanged.

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Section E

Legislative and Regulatory System

Section E. Legislative and Regulatory System

Article 18
Implementation of measures

Article 18. Implementation of measures

Within the area of its national legislation, each Contracting Party shall adopt the legislative, regulatory and administrative measures and those of any other type required to comply with the obligations deriving from this Convention.

Spain has a legislative, regulatory and administrative framework adequate to comply with the obligations arising from this Convention. The Ministry of Industry, Tourism and Trade (MITYC) and the Nuclear Safety Council (CSN), in collaboration with the Empresa Nacional de Residuos Radiactivos S.A. (ENRESA), continue to work within their respective realms of competence on the on-going improvement of standards relating to waste and spent fuel management.

In relation to the above, consideration is given to the applicable national standards, international experience and standards and, in particular, analysis of the applicability of the IAEA's programme of standards for safe management of waste and all those elements that, while not being reflected in the standards, have made it possible to successfully address aspects arising in the authorisations granted to date for radioactive waste management.

Article 19
Legislative and regulatory framework

Art. 19. Legislative and regulatory framework

1) *Each Contracting Party shall establish and maintain a legislative and regulatory framework governing safety in the management of spent fuel and radioactive waste.*
2) *This legal and regulatory framework shall contemplate the establishment of the following:*
   - *i) The national requirements and provisions applicable to radiological safety;*
   - *ii) A system for the awarding of licences for spent fuel and radioactive waste management activities;*

iii) A system prohibiting spent fuel and radioactive waste management without the corresponding licence;

iv) An appropriate regulatory system for institutional control, regulatory inspection and documentation and submittal of reports;

v) Measures to ensure compliance with the applicable regulations and licence conditions;

vi) A clearly defined assignment of responsibilities to the organisations intervening in the different stages of spent fuel and radioactive waste management.

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

19.1. Novelties in the main legal provisions regulating the management of spent fuel and radioactive waste

The present section describes the novelties that have occurred in the provisions of legal rank of the internal legal system in relation to spent fuel and radioactive waste management. It also includes the changes that have occurred in the European Community standards in this area, whose provisions are directly applicable to the internal legal system or need to be transposed to it.

Nuclear Energy Act, Law 25/1964, of April 29th (NEA)

During the period of the report there have been several revisions of different articles of this Act, which is the main legal provision regulating nuclear energy in Spain, through the approval of the following provisions:

a) The third additional provision of Law 12/2011, of May 27th, on civil liability for nuclear damage or damage caused by radioactive materials introduced the following modifications in the NEA:

- The concept of the "permit holder or operator" of a nuclear or radioactive facility is redefined as the physical or legal person entirely responsible for the facility, whose responsibility cannot be delegated.
- The concept of "nuclear safety" is introduced, in keeping with the definition established by Directive 2009/71/EURATOM, which establishes a community framework for the nuclear safety of nuclear facilities. "Nuclear safety" is defined as the achievement of adequate operating conditions for a nuclear facility, the prevention of accidents and the attenuation of their consequences, resulting in protection for the workers and the general public against the risks caused by ionising radiations from nuclear facilities. The new definition is in keeping with that established in the directive.
- Through the new wording of article 28 the Law provides that the licensee of an operating permit for a nuclear power plant shall be a single legal person, such that the system of technical, economic and legal responsibilities in operation of the plant be clearly defined, shall not be delegable, shall give priority to safety above any other consideration and shall favour the existence of fluid and direct relationships between the regulatory authority and the licensee. Likewise, in order to promote transparency in operation and guarantee that the licensees of nuclear power plant operating permits have the resources required for the safe operation of these

facilities, the said licensees are required to have the management of these facilities as their sole purpose, such that they have separate accounting of the income and expenses attributable to each plant, and they shall be obliged to report on the investments and human resources available and forecasts for the future.

- Finally, the licensees are given a maximum period of one year to adapt to the new requirements set out in article 28. In this respect, the Directorate General for Energy Policy and Mines, following a report by the Nuclear Safety Council, must have previously approved the adaptation plan submitted by the licensee.

b) The ninth final provision of Law 11/2009, of October 26th, regulating Quoted Limited Real-Estate Market Investment Companies, added a new article 38 b) to the NEA relating to radioactive waste management and in force since January 1st 2010. The objective of this modification is to compile a series of aspects relating to waste management that, although already contemplated in Law 54/1997, had not entered into force due to the public business entity ENRESA not yet having been effectively constituted. Likewise, new provisions are established deriving from ENRESA being maintained as a mercantile limited company. Specifically, the main novelties introduced are as follows:

   - The management of radioactive waste, including spent fuel, and the dismantling and decommissioning of nuclear facilities constitutes an essential public service for which the State is responsible, in accordance with article 128.2 of the Spanish Constitution, by virtue of which public resources or essential services may be reserved for the sector by law. In accordance with the General Radioactive Waste Plan (GRWP) approved by the Government, the management of this service is commissioned to ENRESA, for which the latter is set up as a resource and technical service of the Administration, carrying out whatever functions might be assigned to it by the Government.
   - The Government shall be responsible for establishing policy regarding the management of radioactive waste, including spent fuel, and the dismantling and decommissioning of nuclear facilities by approving the GRWP, which shall be submitted to it by the Ministry of Industry, Tourism and Trade following a report by the Nuclear Safety Council, the Autonomous Communities having been heard in relation to town and country planning and the environment, and shall subsequently report on it to Parliament.
   - ENRESA operates under the aegis of the MITYC, through the Secretariat of State for Energy, which undertakes the strategic management and tracking and control of its technical and economic actions and plans. The said Ministry may exercise whatever powers of expropriation might be required for fulfilment of the purposes of ENRESA, which shall be the beneficiary in this respect.
   - Finally, the State shall undertake the ownership of radioactive wastes once these have been definitively disposed of and shall be responsible for whatever surveillance might be required following the decommissioning of a nuclear facility, after the period of time established in the corresponding declaration of decommissioning.

Electricity industry act, Law 54/1997, of November 27th

Law 54/1997 is the main legal instrument regulating the electricity industry overall, including the generation of electricity by nuclear means. As regards nuclear energy specifically, apart from the general aspects of electricity generation, the Law contemplates measures relating to the

treatment of the amounts deposited in the Fund for the financing of activities included in the General Radioactive Waste Plan (GRWP), as well as the economic compensations to be paid to the companies owning nuclear assets whose construction was frozen through Law 40/1994, of December 30th, on the Ordering of the Electricity System.

During the period of the report, relevant changes have been made to this standard, particularly as regards contributions to the Fund, through the approval of the following legal provisions:

a) Law 11/2009, of October 26th, regulating Quoted Limited Real-Estate Market Investment Companies.

   Apart from the addition of article 38 b) to the aforementioned NEA, the ninth final provision of this Law completely modifies the sixth additional provision of Law 54/1997 and invalidates additional provision 6 b), with a view to regulating the fund for financing of the activities included in the GRWP, leaving without effect the partial modifications made to this additional provision in the past (through Royal Decree Law 5/2005, Law 24/2005 and Royal Decree Law 6/2009). The new wording, in force since January 1st 2010, implies specification of the system of taxes introduced in Royal Decree Law 6/2009, which, however, never entered into force. The main novelty introduced consists of obliging the licensees of nuclear facilities to internalise the expenses involved in radioactive waste and spent fuel management, and in the dismantling and decommissioning of nuclear facilities, regardless of the date of generation of such wastes, in order to ensure that the application of the principle of "the polluter pays" is fully effective. As was explained in the Third National Report, this internalisation had already been introduced by Royal Decree Law 5/2005, albeit restricted to the management costs incurred as from March 31st 2005. The financing system is explained in article 22.2

b) Law 2/2011, of March 4th, on Sustainable Economy.

   The fifteenth additional provision of Law 2/2011 modifies section 9 point 4 of the sixth additional provision of Law 54/1997, which regulates the tax on the rendering of services for the management of radioactive wastes generated by radioactive and other facilities, contemplating the types of burdens and fees applicable to a series of new types of radioactive wastes additional to those contemplated previously.

Law 6/2010, of March 24th, modifying the reworded text of the project Environmental Impact Assessment Act, approved by Legislative Royal Decree 1/2008, of January 11th

The modifications introduced through Law 6/2010 do not imply any changes to the activities to be subjected to environmental impact assessment, which are set out in Annex I of Legislative Royal Decree 1/2008 and include nuclear power plants and other nuclear reactors, including their dismantling or decommissioning, irradiated nuclear fuel reprocessing facilities and other installations designed for the production or enrichment of nuclear fuel, the management of spent fuel or high level waste, the definitive disposal of spent fuel, exclusively the definitive disposal of radioactive wastes and exclusively the storage (design period longer than ten years) of spent fuel or radioactive waste at a location other than that in which they were produced.

The modifications made by Law 6/2010 are due, on the one hand, to the demands of economic activity (speedy arrangements, increased transparency in activities including the intervention of different administrative organisations and greater efficiency in the performance of environmental assessments) and, on the other, to the liberalisation of the services sector, as reflected in Euro-

pean Parliament and Council Directive 2006/123/CE, of December 12th, relating to services on the internal market.

Council Directive 2009/71/EURATOM, of June 25th 2009, establishing a community framework for the nuclear safety of nuclear facilities

This EURATOM Directive establishes a community framework that aims to maintain and promote the on-going improvement of nuclear safety and its regulation and to guarantee that the member States adopt adequate national provisions for a high level of nuclear safety in the protection of the workers and the general public against the risks posed by ionising radiations arising from nuclear facilities. It is applicable to any civil nuclear facility operating under a licence entailing responsibility for the siting, design, construction, start-up and operation of a nuclear facility, during all the phases covered thereby. Nuclear facilities are understood to be all nuclear fuel enrichment or manufacturing installations, nuclear power plants, research reactors or spent fuel storage installations, as well as radioactive waste storage facilities on the same site and directly relating to those listed above.

The Directive focuses on a series of operational objectives:

- ✓ Reinforcement of the role of the national regulators and of their independence;
- ✓ Responsibility of the licensee in relation to safety under the control of the regulatory body;
- ✓ Priority for safety;
- ✓ Transparency in issues relating to the safety of the facilities and their management; and
- ✓ The performance of periodic self-assessments of the national frameworks and competent regulatory authorities, and peer reviews.

The Directive grants the member States until July 22nd 2011 to transpose its provisions to their national legislations. The Spanish legal system already met the requirements of this Directive, as a result of which it has not been necessary to approve any new provisions. The provisions of the Directive are included fundamentally in the Nuclear Energy Act, Law 25/1964, of April 29th, Law 15/1980, of April 22nd, creating the Nuclear Safety Council, modified by Law 33/2007, of November 7th, and Law 27/2006, of July 18th, regulating rights to access to information, public participation and access to justice in relation to environmental issues; and in the corresponding enacting provisions (fundamentally the Regulation on nuclear and radioactive facilities (RNRF), approved by Royal Decree 1836/1999, of December 3rd, and modified by Royal Decree 35/2008, of January 18th; the Charter of the Nuclear Safety Council, approved by Royal Decree 1440/2010, of November 5th, and various Council Instructions which, pursuant to article 2.a) of Law 15/1980, are technical standards relating to nuclear safety and radiological protection and binding upon those affected by their scope of application, once notified or, where appropriate, published in the Official State Gazette).

19.2. Novelties in provisions of regulatory standing

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

Royal Decree 243/2009, of February 27th, regulating the monitoring and control of shipments of radioactive waste and spent fuel between member States or into and out of the Community

By means of this Royal Decree, Council Directive 2006/117/EURATOM, of November 20th, relating to the monitoring and control of shipments of radioactive waste and spent nuclear fuel was incorporated into Spanish law. Through this Directive a common and obligatory system is adopted for the prior authorisation of shipments of radioactive waste or spent fuel between member States or shipments entering or leaving the Community, with the establishment of the necessary procedures for action and communication between the competent Authorities of the member States, such that any transfer of such materials is known to them and approved by them. This is not applicable to shipments of disused sources to a supplier or manufacturer of radioactive sources or to a recognised facility, nor to radioactive materials recovered by reprocessing for reuse. Neither is it applicable to the transfer of wastes containing only natural radioactive material not resulting from practices. The Royal Decree annuls previous Royal Decree 2088/1994, of October 20th, which incorporated into Spanish law Council Directive 92/3/ EURATOM, of February 3rd 1992, which has been replaced by the aforementioned Directive 2006/117/EURATOM.

The novelties presented by this Royal Decree refer mainly to the simplification and clarification of the procedures to be adhered to, to extension of the scope of application to include shipments of spent fuel not only for definitive disposal but also for reprocessing (which was not included in the scope of application of Directive 92/3/EURATOM and which lacked justification from the point of view of radiological protection) and to adaptation of the contents of other community and international provisions approved subsequent to the entry into force of the annulled Royal Decree, fundamentally the Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management, and Directive 2003/122/EURATOM, on the control of high-activity sealed radioactive sources and orphan sources.

The Royal Decree includes a chapter on intra-community shipments and another on extra-community shipments. While the former are subjected to a set of standards based on fundamental principles established within the framework of the Community and referring to safety in the transport of these materials and to the conditions under which they are stored (definitively or otherwise), in the case of extra-community shipments, consideration is given to the fact that, when these materials are to leave the European Union, the third-party receiving State should not only possess the technical and administrative resources and regulatory structure necessary to safely manage such materials but also be informed of the shipment and consent to it.

The competent authority in charge of issuing the corresponding authorisations and providing appropriate consent in the case of management of the authorisation by another member State is the Directorate General for Energy Policy and Mines of the MITYC, following a favourable report by the Nuclear Safety Council.

Royal Decree 1440/2010, of November 5th, approving the Charter of the Nuclear Safety Council

This Royal Decree replaces previous Royal Decree 1157/1982, of April 30th, which approved the Charter of the CSN and needed to be updated to adapt to the changes introduced by the legislation that has subsequently come about (Law 33/2007, of November 7th, reforming Law 15/1980, of April 22nd, by which the CSN was created).

Initially, changes are made in the structure of the CSN, these being described in greater detail in article 20.2. The Plenary of the Council and its Presidency are defined as being the top manage-

ment bodies of the Organisation, related on the basis of cooperation and respect for the legitimate exercising of their respective competences.

In addition to a new organisational structure for compliance with the functions assigned to the CSN by both Law 33/2007 and other standards of legal rank, especially regarding the advertising of its actions, public information and the participation of the members of the public, the Charter deals especially with the forecast of Law 33/2007 regarding the functions, composition and operation of the "Advisory Committee on public information and participation". The members of this committee were appointed by a Resolution by the President of the CSN on January 15th 2011, and represent civil society, the business world, the trade unions and the local, regional and state Administration. The Committee will be in charge of issuing recommendations to the CSN to guarantee and improve transparency and of proposing measures promoting access to information and the participation of the members of the public in areas for which the CSN is responsible, all the above being non-binding in nature. The committee shall normally meet at least once every six months, with the possibility of its also holding extraordinary meetings.

Also contemplated, as regards the duty to inform the Public Institutions and the Parliament, is the need to report on the performance of the Council's activities to the regional Parliaments of those Autonomous Communities whose territories house nuclear facilities. Also regulated is the obligation to keep the concerned regional governments and town councils informed of circumstances or events that might affect the safety of nuclear and radioactive facilities or the radiological quality of the environment.

The Charter also deals with the CSN's capacity to draw up the technical Instructions, Safety Guides and Circulars contemplated in Law 15/1980.

Furthermore, and as a result of the novelty introduced by Law 33/2007, the CSN Charter includes communication to this Organisation by physical or legal persons at the service of nuclear and radioactive facilities of events relating to nuclear safety and radiological protection. The Technical Division responsible for this particular area, which shall guarantee the anonymity of the communicating party, shall initiate, carry out and determine a procedure aimed at checking the events communicated and, where appropriate, adopting the corresponding corrective measures. In this respect it shall perform the inspections and investigations necessary to clarify the events.

19.3. Novelties in the legal provisions of the Nuclear Safety Council

The legal powers of the CSN are established in article 2 of the law by which it was created, Law 15/1980, of April 22nd, which empower it to propose to the Government all necessary regulations relating to nuclear safety and radiological protection, along with whatever revisions it considers to be appropriate. It may also draw up and approve technical Instructions, Circulars and Guides in relation to nuclear and radioactive facilities and activities relating to nuclear safety and radiological protection, as well as the physical protection of nuclear and radioactive facilities and materials. These functions are developed in greater detail in the new Charter of the CSN (Royal Decree 1440/1010).

While the Circulars and Guides are technical documents of an informative or recommendatory nature, compliance with the Instructions is obligatory. Since 2008, 15 new Instructions have been published, the following affecting the scope of the Convention:

1. CSN INSTRUCTION IS-19, of October 22nd 2008, on the requirements of the nuclear facilities management system.

   The objective of this Instruction is to identify the applicable requirements to establish, implement, evaluate and continuously improve a nuclear facilities management system integrating safety, the prevention of occupational risk, environmental protection, physical protection, quality and economic aspects, in order to guarantee adequate consideration of safety in all the activities of the organisation. The objective of the management system requirements is to ensure that safety is not compromised, considering the implications of all the activities, not separately within the framework of different management systems but in an integrated manner with respect to safety. The Instruction is applicable to the establishment, start-up, evaluation and on-going improvement of the nuclear facilities management system, throughout their entire lifetime: site selection, design, construction, testing, start-up, operation, dismantling and decommissioning.

2. CSN INSTRUCTION IS-20, of January 28th 2009, on safety requirements relating to spent fuel storage casks.

   The objective of this Instruction is to establish the nuclear safety and radiological protection requirements to be met in the design of spent fuel casks for use at authorised temporary storage facilities, to define the necessary documentation and to guarantee that the inter-dependences between design, manufacturing and use are adequately fulfilled.

3. CSN INSTRUCTION IS-26, of June 16th 2010, on basic nuclear safety requirements applicable to nuclear facilities.

   This is a framework standard that establishes a regulatory basis for the on-going improvement of safety at enrichment, nuclear fuel manufacturing and spent fuel storage facilities and at radioactive waste storage installations located at the same site and directly related to the aforementioned facilities. The aim is to consolidate the requirements already established in the operating permits of the facilities and to apply the safety standards developed within the framework of the IAEA and WENRA.

4. CSN INSTRUCTION IS-29, of November 2nd 2010, on safety criteria relating to temporary storage facilities for spent fuel and high level waste.

   This Instruction establishes the basic safety requirements to be met in the design, manufacturing, construction, testing, operation and safety assessment of nuclear facilities for the temporary storage of spent fuel and high level waste. In this respect, the generation of radioactive wastes must be minimised and the design of the facility must allow the spent fuel and wastes to be recovered at any time for inspection, reconditioning and shipment or transfer to another installation or management mode. IT also establishes requirements for the design of the spent fuel or high level waste casks, in order to guarantee safe operation, prevent damage and establish measures for straightforward maintenance and repair.

19.4. Other aspects of the regulatory framework

Facilities authorisation system

The authorisation system applicable to nuclear and radioactive facilities continues to be essentially the one used to date and described in detail in Annex B.

Additionally, and in keeping with what is contemplated in the General Radioactive Waste Plan, during the period covered by the report, the process for the selection of a site for a Centralised Temporary Storage (CTS) facility for spent fuel and high level wastes has begun. Although the authorisation procedure for this installation is governed by the general system applicable to nuclear facilities, the procedure for the selection of candidate municipalities seeking to host the CTS site was described in a Resolution issued by the Secretariat of State for Energy of the MITYC on December 23rd 2009, and is described in greater detail in article 6 of Section G of this report.

System for the inspection and evaluation of nuclear and radioactive facilities

Law 15/1980, of April 22nd, creating the CSN, modified by Law 33/2007, of November 7th, establishes the functions of this Organisation as the guarantor of nuclear safety and radiological protection. Among these functions is the inspection of nuclear and radioactive facilities during the phases from design to decommissioning, the CSN being responsible during this last phase for the inspection of the plans, programmes and projects required for the management of radioactive waste. The inspection activities have not been modified with the new Law, which introduces as a novelty in this area collaboration with the competent authorities in the performance of the inspections of nuclear safeguards deriving from the commitments of the Spanish State.

These inspection activities are complemented with the assessment of the facilities, for which the CSN submits reports to the MITYC, as a step preliminary to the resolution to be adopted by the latter for the granting of authorisations for nuclear and radioactive facilities, as well as for all activities relating to the handling, processing, storage and transport of nuclear and radioactive substances. The minutes of inspections performed by the CSN are published on its website, following removal of those data that might legally affect confidentiality or that cannot be disclosed due to their being legally protected or affecting the intimacy of persons, national defence and public security, commercial or industrial secrets or intellectual property rights or to the existence of on-going sanctions or disciplinary processes, among others.

System of sanctions relating to nuclear facilities

The system of sanctions relating to nuclear energy is established in Chapter XIV (articles 85 to 92) of Law 25/1964, in the wording given by Law 33/2007, which implied a more detailed definition and improved description of events constituting infringements, increasing the monetary scope of the sanctions and revising certain of the applicable technical criteria for qualification of the sanctions and specific aspects of the procedure governing the administrative treatment of sanctions proceedings. The main aspects of the sanctions system were described in the third national report.

The CSN is responsible for initiating sanctions proceedings with respect to events that might constitute infringements in relation to nuclear safety, radiological protection and security, and is required to inform the corresponding body – the Directorate General for Energy Policy and Mines of the MITYC – of the initiation of the corresponding proceedings. When sanctions proceedings have been initiated in relation to such matters and are not the result of a proposal by the CSN, or when they result from such proposals but entail data other than those provided by the CSN, the CSN shall issue a report within 3 months for adequate qualification of the events.

The maximum period for the management and notification of the proceedings by the sanctioning body is 1 year, and it is possible for this period to be suspended, for up to three months, when 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 continues to be essentially the same as existed previously, as described in Section A of this report. The competences and functions of the MITYC in relation to nuclear energy have not altered during the period of the report, and are those contemplated in Royal Decree 1226/2010, of October 1st, which deals with the basic organisational structure of the said Ministry and annuls previous Royal Decree 1182/2008, of July 11th. These functions have not undergone any relevant modifications since Royal Decree 1554/2004, of June 25th, although the Secretariat General for Energy has been replaced with the Secretariat of State for Energy, which therefore takes over the competences of the former. As is pointed out in section 20.1 of this report, the Directorate General for Energy Policy and Mines reports to this Secretariat.

With regard to the Nuclear Safety Council, its competences and functions have not been substantially modified as regards their general aspects, as set out in the Law by which it was created, although they have recently been developed through the Council's new Charter, approved by Royal Decree 1440/2010, of November 5th, as described in section 20.1 of this Report.

Finally, and as commented on above, the management of radioactive wastes, including spent fuel and the dismantling and decommissioning of facilities, constitutes an essential public service for which the State is responsible and which is commissioned to ENRESA, the latter being set up as a resource and technical service of the Administration, by virtue of article 38 b) of the Nuclear Energy Act, in the wording given by Law 11/2009. The responsibilities attributed to ENRESA continue to be those established in Royal Decree 1349/2003 and relate to the field of radioactive waste management in all its forms, including the dismantling and decommissioning of nuclear and radioactive facilities, and activities relating to this issue, such as the management of the Fund for financing of the GRWP, the performance 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 nuclear and radiological emergencies in support of the competent authorities.

Article 20
Regulatory body

Article 20. Regulatory body

1. *Each Contracting Party shall set up or designate a regulatory body to take charge of the application of the legislative and regulatory framework referred to in article 19, provided with the authority, competence and financial and human resources adequate for compliance with the responsibilities assigned to it.*

2. *Each Contracting Party shall, in compliance with its legislative and regulatory framework, adopt adequate measures to ensure effective independence between regulatory and other functions when they involve entities intervening both in the management of spent fuel or radioactive waste and in its regulation.*

In Spain the regulatory function in the field of nuclear energy corresponds to the following authorities, which act within the scope of application of the Convention in accordance with their respective competences, pursuant to the legislation in force:

- ✓ **The Government**, responsible for defining energy and radioactive waste management policy and for issuing regulatory standards in response to proposals by the ministries competent in each different area.

- ✓ **The Ministry of Industry, Tourism and Trade** (MITYC), which is the ministerial Department of the Central State Administration responsible for granting, modifying, suspending or cancelling authorisations for nuclear and radioactive facilities[1], subject to the mandatory and, where appropriate, binding[2] reports from the Nuclear Safety Council (CSN) in relation to nuclear safety and radiological protection, as well as to the reports to be issued by other Departments or Bodies of the Central Administration in other areas and in accordance with the requirements of their specific standards[3]. This Ministry is also responsible for submitting regulatory proposals for the development of the legislation in force to the Government, for adopting provisions enacting Government regulations and for applying the system of sanctions in relation to nuclear energy.

- ✓ The Governments of the **Autonomous Communities** to which have been transferred executive functions attributed to the MITYC, 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 April 22nd, modified by Law 33/2007, is the sole State organisation having competence in relation to nuclear safety and radiological protection, an entity existing under Public Law and independent from the General State Administration, with its own legal standing and equity.

In exercising the competences and functions established in the legislation, the CSN needs to maintain relations with the Parliament (Congress and Senate) and the Government, as well as with the competent ministerial departments of the latter and the Governments of the Autonomous Communities.

As regards relations with the Parliament, the competent Commission of the Congress tracks CSN matters, either through the periodic appearances made in response to requests by the Congress or those requested by the CSN to inform on relevant issues. The Commission may also require the appearance of other public authorities or entities linked to nuclear energy. As a result of

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

[2] The CSN reports are binding when negative, the conditions determined being binding when positive.

[3] The regulation of the security of nuclear materials is an issue shared by the MITYC, the Ministry of the Interior and the CSN, each of these institutions being responsible for exercising the functions included within its respective realm of competence. The regulation in force establishes that the Ministry of the Interior and the CSN shall submit reports to the MITYC prior to the latter's granting security authorisations.

[4] Specifically in the case of the Autonomous Communities of Catalonia, the Basque Country, the Balearic Islands, Murcia, Extremadura, Asturias, Madrid, Galicia, Cantabria, the Canary Islands, Ceuta, Navarra, Valencia, Castilla y León, La Rioja and Aragón (in this last case the Royal Decree establishing the transfer was approved in 2010 – Royal Decree 252/2010, of March 5th).

these appearances, the Congress may, on proposal by the Commission, urge the Government, the MITYC or the CSN, depending on the matter in hand, to establish certain measures or initiate proceedings. Analogously, the CSN appears before the competent Commission of the Senate, on request by the said institution or on its own initiative, to report on matters included within its realm of competence.

Furthermore, the CSN maintains relations with the Government, fundamentally through the MITYC (in accordance with Royal Decree 1226/2010, of October 1st), on all matters relating to regulation of the different phases of site selection, construction, start-up, operation and dismantling of nuclear and radioactive facilities. The MITYC is responsible for requesting the mandatory, and occasionally 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 shall propose the new regulations and the revision of those already existing to the Government in relation to nuclear safety, radiological protection and the physical protection of nuclear and radioactive facilities and materials in collaboration with the competent authorities, as well as those required as a result of the international obligations contracted in this field. Likewise, the CSN may propose the initiation of whatever sanctions proceedings might be appropriate.

The CSN also maintains relations with other ministerial departments, both for the better performance of its functions and for cooperation in areas of common interest. Apart from the MITYC, the main ministerial departments with which the CSN maintains relations are the following:

- ✓ Ministry of the Environment and Rural and Marine Affairs: the CSN participates in the procedure for the declaration of environmental impact, as regards assessment of the environmental radiological impact of facilities potentially causing an impact of this type.
- ✓ Ministry of the Interior and Ministry of Defence, in relation to the management of emergencies, security and civil defence in response to radiological risk.
- ✓ Ministry of Education, in relation to the training of secondary school teachers.
- ✓ Ministry of Public Health and Social Policy: the CSN collaborates with the Ministry on issues relating to radiological protection (protection of patients, workers, the public and the environment).

It should also be pointed out that both the MITYC and the CSN maintain relations, in their respective areas of competence, with the Parliaments and Governments of the Autonomous Communities.

Firstly, and as regards the MITYC, the Spanish legislation contemplates the possibility of certain of the competences of the Central Administration being transferred to the Autonomous Communities. As has been pointed out above, several Autonomous Communities exercise executive functions originally attributed to the MITYC by the Regulation on Nuclear and Radioactive Facilities in relation to 2nd and 3rd category radioactive facilities. In addition, the MITYC is obliged to transfer to Autonomous Communities housing facilities or whose territory is part of the action zone of the Nuclear Emergency Plan the information presented in their requests for authorisation, and requests for transfer of authorisations, such that they may make the appropriate allegations.

Furthermore, as regards the CSN and in keeping with the provisions of Law 15/1980, in the wording given by Law 33/2007, the Council may assign to the Autonomous Communities the exercising of functions attributed to it, in accordance with the general criteria agreed to by the CSN for such exercising. These assignment agreements are without prejudice to the exercising of competences attributed to the CSN in the legislation, which shall remain under its responsibility. At present the CSN has function 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 November 7th, reforming CSN Law 15/1980, a representative of those Autonomous Communities that house nuclear facilities within their territory or that have function assignment agreements with the CSN shall form part of the "Advisory Committee on public information and participation in relation to nuclear safety and radiological protection".

Finally, it should be added that pursuant to the CSN Charter, the Council shall keep the Government, the Congress and Senate, the regional Governments and Town Councils concerned punctually informed of any circumstance or event affecting the safety of the nuclear and radioactive facilities or the radiological quality 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 that have nuclear facilities within their territory.

20.1. Structure, competences and functions of the Ministry of Industry, Tourism and Trade

20.1.1 Organisational structure

The basic organisational structure of the ministerial departments of the Government currently in force was established by Royal Decree 495/2010, of April 30th, modified by Royal Decree 940/2010, of July 23rd, among others, the following high-ranking bodies being assigned to the MITYC:

- ✓ The Secretariat of State for Energy
- ✓ The Secretariat General for Tourism and Domestic Trade
- ✓ The Secretariat of State for Overseas Trade
- ✓ The Secretariat of State for Telecommunications and the Information Society
- ✓ The Sub-secretariat for Industry, Tourism and Trade
- ✓ The Secretariat General for Industry

The most important modifications undergone by the basic organisational structure of the MITYC with respect to the third national report have been as follows: on the one hand the Secretariat of State for Tourism and Trade has been broken down into the Secretariat of State for Overseas Trade and the Secretariat General for Tourism and Domestic Trade, and, on the other, the Secretariat General for Energy has been replaced by the Secretariat of State for Energy, which takes on the competences attributed to the said Secretariat General.

The basic organisational structure of the MITYC is set out in Royal Decree 1226/2010, of October 1st, which annuls the previous Royal Decree 1182/2008, of July 11th, which establishes that the Secretariat of State for Energy is the governing body in energy matters and that, within this Secretariat the Directorate General for Energy Policy and Mines (DGPEyM) is the management body responsible for the functions detailed in the following section in the specific field of nuclear energy.

Within the DGPEyM, the Sub-directorate General for Nuclear Energy (SGEN) is responsible for the practical performance of these functions. In addition, the SGEN maintains relations with other management bodies and general services of the MITYC, integrated both inside and outside the Secretariat of State for Energy, for the exercising of its functions, such as 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 for relations

with Spain's Permanent Representations before the International Organisations specialising in nuclear energy, or the new Sub-directorate General for International Energy Relations, created to undertake the coordination and management of international energy-related affairs and processes, participate in different international fora, participate in the drawing up of community standards or monitor community energy policies (including nuclear), among other competences.

Section L, Annex F of this report includes an organisational flowchart of the MITYC, highlighting those bodies that have functions relating to the Convention attributed to them, along with a block diagram of the structure of the functional areas and services of the SGEN.

20.1.2 Competences and functions

In accordance with the current legal system, the MITYC is one of the authorities having competences and functions within the Spanish regulatory system in relation to energy, and more specifically in relation to nuclear energy. It should be pointed out that the Spanish electricity system is completely liberalised, as a result of which, and as has been indicated above, the Government's actions via the MITYC are limited to the establishment of an indicative energy plan and the regulation of the different energy sectors. Consequently, the MITYC does not exercise any function as regards the promotion or use of nuclear energy.

Regardless of the replacement of the Secretariat General for the Secretariat of State, the nuclear energy-related competences attributed to the different bodies have not been substantially modified with respect to Royal Decree 1554/2004, which set out the competences and functions for the period covered by the third national report. Pursuant to the provisions of Royal Decree 1226/2010, the MITYC exercises the following competences and functions, which are described in detail in the third report and which are encompassed by the scope of the Joint Convention:

i. It is responsible for granting authorisations for nuclear and radioactive facilities, except for second and third category radioactive facilities located in Autonomous Communities having executive functions corresponding to the Central Administration transferred to them, following a favourable report by the CSN.

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

iii. It manages the administrative records (in relation to the 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 the R&D policy, in coordination with the Ministry of Science and Innovation. In this respect, in response to an initiative by the MITYC, the Strategic Nuclear Energy R&D Committee (CEIDEN), the predecessor of the current Nuclear Fission Energy R&D Technology Platform, was set up in 1999, the aim being to bring together all the different agents involved in the nuclear energy sector, including in addition to the MITYC itself, the CSN, universities and research centres, operators and industry associations, with a view to identifying synergies and points of common interest in the research activities and programmes carried out by them and to participating in international programmes[1].

[1] *The CEIDEN currently includes some 70 represented entities. Its Presidency is renewed every two years and is currently occupied by the CSN.*

vi. It monitors compliance with the international commitments subscribed to by Spain in the field of nuclear energy, in particular in relation to non-proliferation and civil liability for nuclear damage.

vii. It maintains relationships with the International Organisations specialising in nuclear energy through the SGEN (within the framework of the Euratom Treaty and related committees and working groups, within the framework of the IAEA and the OECD's Nuclear Energy Agency (NEA), in relation to the European Reconstruction and Development Bank or the European Nuclear Energy Forum, etc.).

20.1.3 Human resources and training

The SGEN, which is the Sub-Directorate General responsible for performance of the functions of the MITYC in relation to nuclear energy, is manned entirely with civil servants belonging to the different departments of the State Administration. The normal system for access to jobs in the different units of the MITYC, including the SGEN, included in the offer of public sector employment, is via an examination followed by a selective training course. In addition, jobs may be covered within the SGEN by the transfer of civil servants from other areas of the General State Administration, as long as the functions from which such workers are transferred are compatible with those required for the vacancies to be covered in the MITYC.

At present the SGEN provides 15 jobs. Of the civil servants currently belonging to the SGEN, 75% have a university background, most of them being industrial engineers belonging to the State Corps of Industrial Engineers, although there are also others with different academic backgrounds, such as forestry experts and graduates in law. The distribution of the workforce in terms of knowledge and experience of administrative matters and nuclear technology is balanced and in keeping with the needs of the service.

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

The training programme for the personnel of the SGEN is integrated in the general training plan of the MITYC, which contemplates both training 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

The first final provision of Law 33/2007, of November 7th, reforming Law 15/1980 by which the Nuclear Safety Council was created, established the mandate of the Government for approval of the modification of the CSN Charter (Royal Decree 1157/1982, of April 30th). This Charter was approved by means of Royal Decree 1440/2010, of November 5th. In accordance with the Law and the new Charter, the organisational structure of the CSN has undergone certain modifications and is now as follows:

- ✓ President
- ✓ 4 Counsellors, one being the Vice-President.
- ✓ Secretariat General, to which report the following:
  - ➪ The Technical Directorate for Nuclear Safety and Sub-Directorates reporting to it.
  - ➪ The Technical Directorate for Radiological Protection and Sub-Directorates reporting to it.
  - ➪ The following Sub-Directorates:
    - – Sub-Directorate General for Personnel and Administration.
    - – Sub-Directorate for Information Technologies
    - – Sub-Directorate for Legal Advisory Services.
  - ➪ The following Units:
    - – Planning, Assessment and Quality Unit.
    - – Inspection Unit.
    - – Research and Knowledge Management Unit.

Section L, Annex F of this report includes an organisational flowchart of the CSN.

The Plenary of the CSN, formed by the President and the Counsellors, is the organisation's collegiate governing body and adopts the agreements by which the CSN is ruled. The Government and the Parliament intervene in the procedure of appointing and replacing the members of the Plenary. Both the Plenary of the CSN and the Presidency are governed by the principle of competence and there is no hierarchical subordination between them.

The Plenary is assisted by a Secretariat General to which report the two following Technical Directorates, among other units:

- ✓ The Technical Directorate for Nuclear Safety brings together all the functions relating to the safety of the 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 the Technical Directorate for Nuclear Safety: Nuclear Facilities, Nuclear Technology and Engineering.
- ✓ In addition to the inspection and control of radioactive facilities, the radiological protection of the workers and the management of low and intermediate level radioactive waste, the Technical Directorate for Radiological Protection is responsible for the radiological protection of the public and the environment and for radiological emergencies. 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 an Entity existing under Public Law with its own legal standing 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 mainly listed in article 2 of Law 15/1980 and in Title I of its Charter, without prejudice to those competences that are included in other standards. As regards the scope of the Convention, and in summary, the functions of the CSN are as follows:

1) It issues mandatory reports to the MITYC 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 dictated by the MITYC in exceptional cases and circumstances in relation to the safe removal and management of radioactive materials.

2) In relation to radioactive wastes, it informs the MITYC of the concentrations or levels of activity of materials containing or incorporating radioactive substances and for which no further use is foreseen, in order for them to be considered as such.

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

4) It proposes the initiation of sanctions proceedings within its realm of competence. Likewise, the Council will issue a mandatory report within a period of 3 months for adequate qualification of the facts when sanctions proceedings relating to nuclear safety, radiological protection or security have been initiated by some other Organisation or in response to a justified request by the CSN itself and include data additional to those provided by the latter. The sanctions shall be imposed by the competent executive body of the Central Government or of the Governments of the Autonomous Communities.

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

5) The CSN undertakes the surveillance and control of nuclear and radioactive facilities, inspecting and controlling such installations throughout all the phases of their lifetime, inspecting the transport, manufacturing and homologation of equipment containing radioactive sources or generating ionising radiations and approving or validating packages to be used for the transport of radioactive substances.

   It also maintains surveillance and control over the radiation doses received by the operating personnel and off-site releases of radioactive materials from nuclear and radioactive facilities, as well as the specific or cumulative effects of such releases on the areas of influence of these installations.

6) The CSN performs 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 General Radioactive Waste Plan, which the MITYC 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 or radiological protection, advising the Government with respect to commitments with these organisations or with other countries[1].

8) The CSN informs the public on matters for which it is responsible, without prejudice to the announcement of its administrative activities in the legally established terms.

[1] *In view of their relevance within the framework of the Convention, international relationships are briefly described in the following sub-section.*

The CSN is obliged to inform the public of all relevant events at nuclear and radioactive facilities; the reports issued by it and the minutes of inspections performed are made public and a procedure is established for public information during the drawing up of CSN Technical Instructions and Guides.

9) It collaborates with the competent authorities in the drawing up of criteria to be met by the off-site emergency plans and security plans of nuclear and radioactive facilities.

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

   It inspects, assesses, controls, proposes and adopts whatever prevention and correction measures might be required in the face of exceptional situations or situations of nuclear or radiological emergency when these arise in relation to facilities, equipment, companies or activities not subject to the system of authorisations of the nuclear legislation.

10) It establishes and monitors research plans relating to nuclear safety and radiological protection.

11) It files and takes custody of the documentation to be submitted to the Nuclear Safety Council by the licensees of operating permits for nuclear facilities on the definitive shutdown of practices and prior to the transfer of ownership and granting of the dismantling permit.

20.2.3. International relations of the CSN

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

The main activity as regards multilateral international relations consists of the CSN's participation 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 the institutions of the European Union (EU). The CSN also collaborates with international non-governmental institutions 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:

- ✓ Convention on Nuclear Safety: the CSN acts as a national point of contact and coordinates the drawing up of the national reports for Review Meetings.
- ✓ Joint Convention: the CSN cooperates with the MITYC in the drawing up of national reports.
- ✓ Convention on the Security of Nuclear Materials.
- ✓ OSPAR Convention.
- ✓ Convention on the Prompt Notification of Nuclear Accidents.
- ✓ Convention on Mutual Assistance in the event of Nuclear Accidents or Radiological Emergencies.

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

- ✓ The International Nuclear Regulators Association (INRA).

- ✓ The Western European Nuclear Regulators Association (WENRA).
- ✓ The European Association of Radiological Control Authorities (HERCA).
- ✓ The Latin American Forum of Nuclear and Radiological Regulatory Organisations (FORO).

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

The CSN has actively participated in the definition and development of the IAEA's technical cooperation programme, providing experts for participation in seminars, receiving scholars and scientific visits by experts from overseas and organising in Spain various workshops and seminars in relation to the safe management of radioactive wastes.

20.2.4. Human resources, training and financing of the CSN

Human resources

The CSN, as the organisation in charge of a question such as nuclear safety and radiological protection, needs technical personnel specialising in this area. The technical personnel in question are civil servants belonging to the Technical Division of Nuclear Safety and Radiological Protection, as established in article 8 of the Law by which the CSN was created, in the wording given by Law 33/2007, access to which is gained by a competition-examination called by the CSN itself. In addition to such personnel, the Organisation also employs civil servants from other Divisions of the Public Administrations, temporary personnel and contract personnel.

As of December 31st 2010, and including the eight members of the upper management (President, four Counsellors, Secretary General and two Technical Directors), the CSN workforce was made up of 469 people, of which 218 are civil servants belonging to the Technical Division of Nuclear Safety and Radiological Protection, in charge of the inspection, control and monitoring of the operation of the nuclear and radioactive facilities, 138 are civil servants from other Public Administrations, 26 are temporary office personnel and 79 are contracted.

The number of women employed by the CSN represents 51.80 % of the total workforce, and that of men the remaining 48.20%. The average age of the Organisation's personnel is 49 years.

As regards academic qualification, 66.31% of the personnel are post-graduates, 5.97% are graduates and 27.72% have other qualifications.

CSN personnel Training Plan

In view of its specific characteristics, the CSN attaches special importance to the training of its human resources. During 2010 development of the Training Plan has continued such that its objectives were aligned with the CSN Strategic Plan for 2005-2010, with the subjects grouped into seven areas:

- ✓ Nuclear Safety.
- ✓ Radiological Protection.
- ✓ Development of management skills, organisation and communication.
- ✓ Standards, administration and management.
- ✓ Information systems and quality.

- ✓ Languages.
- ✓ Training of civil service trainees.

The CSN's training activities during 2010 have centred on a staff of 469 persons who have participated on average in 2.6 training actions per year. A total 137 courses have been delivered. The time dedicated to training amounted to 33,455 hours, 4.50% of the working day. The expenses in training tasks amounted to 634,539.20 Euros.

The first process of assessing the competence-based management model applied to training, initiated in 2009, was completed in 2010, and has served to individually assess the training needs of 92.39% of the CSN personnel. The different assessment committees have drawn up their conclusions, unifying them through the final assessment Committee. The data obtained have served as a basis for the design of the 2011 Training Plan and for the introduction of improvements to the process.

Likewise, efforts have continued with a view to promoting the presence of the Council in national and international forums (congresses, meetings, seminars…) relating to its functions and areas of competence.

Financing

The budgets for CSN expenses and income are integrated in the General State Budget, as a result of which their approval corresponds to Parliament. The two major items of the budget as regards income are, on the one hand, the tariffs, public prices and other revenues that the CSN receives as payment for its services and, on the other, the transfers made by the State.

a) The tariffs, public prices and other revenues are regulated by Law 14/1999, of May 4th, on Tariffs and Public Prices for services rendered by the Nuclear Safety Council. The following activities are financed by these tariffs:

   - ➪ Performance of studies, reports and inspections prior to the authorisations for the operation and decommissioning of nuclear and radioactive facilities granted by the MITYC.
   - ➪ Inspection and control of nuclear and radioactive facilities and related activities.
   - ➪ Granting of licences for the personnel who are to operate or supervise the operation of nuclear and radioactive facilities.

   Reports, tests or studies on new designs, methodologies, simulation models or verification protocols relating to nuclear safety or radiological protection are financed by way of public prices. In 2010, this financing item represented 83.06% of the total budget.

b) Transfers by the State. The CSN carries out controls of radiological protection measures in place to protect the general public and the environment. These functions are not covered by tariffs and prices but are funded from the General State Budget via the MITYC. The financing obtained in this manner constituted 6.47% of the total budget.

   However, the Austerity Plan of the General State Administration for the period 2010-2013, approved by the Cabinet of Ministers on January 29th 2010, contemplates the progressive phasing out of this financing.

   The remainder of the financing during the 2010 financial year (10.47%) corresponded fundamentally to the budget heading of financial assets, in particular to cash balances.

20.2.5. CSN MANAGEMENT SYSTEM

In early 2008 the CSN hosted an IRRS Mission. The Mission identified 19 good practices, 26 suggestions and seven recommendations. 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 on-going improvement that was implemented within the Organisation. The CSN has requested that the IAEA carry out a follow-up mission, which will take place during the early months of 2011.

The CSN has implemented a process-oriented Management System based on the requirements of the IAEA (GS-R3) and the ISO 9001: 2008 standard. The processes, which cover all the activities of the Organisation, have been classified as follows:

- ✓ Strategic, including the operation of the Council, information and communication and standards development.
- ✓ Operational, including the authorisation, evaluation, supervision and control of facilities and activities (including transport); the licensing of the personnel; the radiological protection of the workers, the public and the environment; emergency management and security.
- ✓ 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, Organisation Manual and Procedures. All these documents, along with the information and documentation required to carry out the regulatory activity, are available to all the personnel on the CSN intranet, with exceptions justified on the grounds of security or confidentiality.

The Management System is subject to on-going improvement. In addition to assessing compliance with the plans and objectives, the CSN has an internal audits plan (formalised and implemented as a result of the IRRS Mission) and is systematically subjected to external assessments by national and international organisations.

- ✓ The internal audits plan ensures that all the operating processes are audited at least every three years, and the rest every four. In the case of processes with commissioned activities, the internal audits plan foresees that these include the said activities.
- ✓ In addition to being subjected to the economic-financial audits and controls 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. The Parliament is responsible for continuously monitoring the activities of the CSN.

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Section F

Other Provisions Relating to Safety

Section F. Other Provisions Relating to Safety

ARTICLE 21
RESPONSIBILITY OF LICENSEE

Article 21. Responsibility of licensee

1. *Each Contracting Party shall ensure that the prime responsibility for safety in spent fuel or radioactive waste management be to the bearer of the corresponding licence, and shall adopt adequate measures to ensure that the said licensee accepts his responsibilities.*
2. *In the event of there not being a licensee or other responsible party, the responsibility shall be to the Contracting Party having jurisdiction over the spent fuel or radioactive wastes.*

21.1. RESPONSIBILITY OF LICENSEE IN RELATION TO SAFETY

The Spanish regulations establish as a basic principle that the prime responsibility for the safety of waste management facilities shall be to the licensee.

The legal precepts by which the responsibility of the licensee is assigned are included in the Nuclear Energy Act and the Regulation on Nuclear and Radioactive Facilities (RNRF). 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 contemplated in the legislation. Consequently, the Spanish regulations on nuclear energy establish in principle that the prime responsibility for the safety of the facilities is to the licensee.

The Nuclear Energy Act, Law 25/1964, defines the operator of a nuclear facility as being the physical or legal person holding the authorisation required for its start-up.

The RNRF in force establishes that in order to obtain the different authorisations the applicant must present the organisation contemplated for supervision of the project and guarantee quality during the successive phases of the facility. It also requires that he describes in detail each of the job posts in the organisation of the operator and the responsibilities assigned to each in relation to nuclear safety and radiological protection, and that he presents the organisation foreseen for the future operation of the facility and a preliminary plan for the training of the operating personnel.

The RNRF also indicates that the licensee of the facility is responsible for ensuring that all physical and legal persons intervening as contractors or sub-contractors at the facility carry out their

activities under conditions of safety and in all cases in accordance with the requirements of the official documents.

The ninth final provision of Law 11/2009, of October 26th, regulating Quoted Real-Estate Market Investment Companies creates a new article 38 b) in Law 25/1964, establishing that the State shall take over the ownership of radioactive wastes once they have been definitively disposed of. It shall also undertake whatever surveillance may be required following the decommissioning of a nuclear or radioactive facility, following the period of time established in the corresponding declaration of decommissioning.

21.2. Liability for nuclear damage

Spain is a contracting party to the Paris Convention, of July 29th 1960, on civil liability in relation to nuclear energy, and to the Brussels Convention, of January 31st 1963, complementing the former. The Paris Convention establishes a system of objective civil liability of the licensee of the facility for whatever nuclear damage might be caused by a nuclear accident. The amount and time of this liability is limited, and it is required to be covered by an insurance policy or other authorised financial guarantee. The Brussels Convention of January 31st 1963 establishes a complementary system of compensation for victims, above the first level of compensations established by the Paris Convention

Traditionally, the application of these Conventions in internal law was established in chapters VII to X of the Nuclear Energy Act, Law 25/1964 (NEA), which is developed by Decree 2177/1967, of July 22nd, approving the Regulation on the Coverage of Nuclear Risk. The amount for the civil liability attributed to the licensees of nuclear facilities, initially established in the internal legislation in compliance with the Paris Convention, was 300 million pesetas (1.8 million Euros). Nevertheless, in accordance with the recommendations of the Steering Committee of the OECD Nuclear Energy Agency, this amount was increased to 25,000 million pesetas (150 million Euros) in 1994, by Law 40/1994, on the Ordering of the National Electricity Industry. Subsequently, in 2007, this amount was once more increased to 700 million Euros by Law 17/2007, of July 4th, which modified the Electricity Industry Act, Law 54/1997, of November 27th, anticipating the requirement of the 2004 Protocol amending the Paris Convention, despite it not having entered into force.

Recently, the system of civil liability for nuclear damage has undergone significant modification as a result of adaptation of the Spanish standards to the Protocols amending the Paris and Brussels Conventions. As indicated in previous national reports, Protocols amending the Paris and Brussels Conventions were approved on February 12th 2004, the main novelties of which were described in the third report. These Protocols were ratified by Spain in November 2005. A large part of the EU member States are party to the Paris Convention and have subscribed to these amendment Protocols. These States will jointly deposit their instruments of ratification of the Protocols[1] on a date yet to be determined. When his occurs, their internal legislation shall be required to fully adopt all the provisions of the said amendment Protocols.

To this effect, Spain introduced several transitory modifications in Law 25/1964, by way of additional provisions to Law 17/2007, of July 4th, which are described in the third national report. As a definitive adaptation, Law 12/2011, of May 27th, on civil liability for nuclear damage or damage caused by radioactive materials (LCNL) has recently been approved, the aim being to regulate the system in a Law independent from Law 25/1964, taking into account the special

[1] *Decision 2004/294/CE, of the European Council, of 8th March 2004, states that those Member States which are parties to the Paris Convention shall adopt those measures needed for jointly rendering their ratifications to the Secretariat to the Protocol of 2004 that amends the said Convention.*

nature of the issue and the intervention of different organisations of the Administration depending on their competences, the sections of Law 25/1964 that have traditionally governed this area having been annulled. The new law will enter into force on the date on which the two Protocols enter into force in Spain.

The LCNL provides that the liability of the licensees shall be objective and limited to the amount of 1,200 million Euros for damage caused within the national territory or in the territory of States that are party to the Brussels Convention. As regards damage caused in States that, being party to the Paris Convention, are not party to the Brussels Convention, and third-party States not possessing nuclear facilities, the liability is limited to 700 million Euros, in keeping with the obligations set out in the Paris Convention. Finally, the liability of the licensee for damage caused in other States shall be reduced to an amount equivalent to that contemplated by the said State in its legislation with regard to Spain, in keeping with the principle of reciprocity. Furthermore, the MITYC may reduce the civil nuclear liability of the licensees of facilities considered to be of low risk or of shipments of nuclear substances to an amount of no less than 70 and 80 million Euros, respectively, in keeping with the provisions of the Paris Convention. Likewise, pursuant to the Brussels Convention, the 1,200 to 1,500 million Euro liability bracket is maintained, to be covered with public funds provided by all the States Party to the Brussels Convention, proportionally to their installed nuclear power and GNP.

Furthermore, the LCNL obliges the licensees to establish financial guarantees for the total sum of the liability corresponding to them in each case. This guarantee is to be provided by contracting an insurance policy, by some other financial guarantee constituted with an entity authorised by the Ministry of Economy and the Exchequer or by a combination of both these options.

In addition to the aforementioned substantial increase in the quantities involved in liability, mention should be made of the fact that the LCNL incorporates into Spanish internal law the provisions contained in the revised Paris Convention, including those considered to be most relevant, such as the increase in the period for claims regarding personal damages (which changes from 10 to 30 years) or the extension of the concept of nuclear damage to include measures for restoration of the degraded environment and prevention, as well as compensations for loss of income relating directly to the use and enjoyment of the environment that has been degraded.

Furthermore, in addition to regulating civil liability for nuclear damages caused at the facilities and in the transport of nuclear substances in accordance with the said Protocols, the LCNL includes a specific regulation for damages caused by accidents involving radioactive materials that are not nuclear substances and occurring within the national territory. This regime contemplates damages to persons and property, the economic losses arising as a result of such damages and environmental damages. As regards the two first, the obligation to provide a minimum coverage to a value depending on the activity of the radioactive material is established. As regards environmental damages, the LCNL refers to the standards on environmental liability in force.

21.3. Regulatory control activities

Regulatory control is carried out fundamentally through the assessment and inspection activities performed by the CSN. Information on these activities is included in Section E, article 19.

In this context, and with a farther-reaching objective than that referring to responsibilities in waste management, the CSN has issued safety guide GSG-1.13, “Content of the operating regulations[1] of nuclear power plants”.

[1] *The operating regulation is an official operating document that describes the structure and functions of the different sections of the licensee’s organisation.*

Its objective is to define a set of criteria standardising the content of the operating regulations of the facilities in operation, firstly because there were significant differences in the content of the regulations of the different installations and, secondly, because the effects associated with the liberalisation of the economic framework of the electricity industry reinforce the importance of the tracking and control of the organisational changes at nuclear facilities.

The CSN requires the licensees of the plants to analyse, justify and document all reductions in the personnel performing safety-related functions at the facilities, even in the event that these do not require previous authorisation due to their not implying changes to the Operating Regulation in force at the corresponding installation.

ARTICLE 22
HUMAN AND FINANCIAL RESOURCES

Article 22. Human and financial resources

Each Contracting Party shall adopt adequate measures to ensure the following:

i. The availability of the qualified personnel necessary for safety-related activities during the operating lifetime of a spent fuel and radioactive waste management facility:

ii. The availability of sufficient financial resources to maintain the safety of spent fuel and radioactive waste management facilities during their operating lifetime and for decommissioning;

iii. The adoption of financial provisions allowing appropriate institutional controls and radiological surveillance activities/measures to continue to be applied during the period considered necessary following the closure of a radioactive waste disposal facility.

22.1. AVAILABILITY AND QUALIFICATION OF HUMAN RESOURCES

As indicated in the Third National Report, the modification of the Nuclear Energy Act through the revision of the Law creating the CSN, referred to on numerous occasions in this report, establishes that the organisations responsible for the management of nuclear and radioactive facilities shall have available human, technical and economic resources adequate for the maintenance of conditions of safety and shall incorporate the basic principles of safety management.

The RNRF, which regulates the system of administrative authorisations, establishes requirements regarding the organisation that the licensee should present for the licensing of a facility and for personnel licences and accreditations.

✓ **Internal organisation of personnel**

In the operating application granted in accordance with the procedure indicated in the RNRF, the Operating Regulation of the installation contains the organisation of the licensee, including the functions and responsibilities of all job posts relating to nuclear safety and radiological protection. Any modifications to this document must be approved by the Directorate General for Energy Policy and Mines of the MITYC, following a mandatory report by the CSN.

In this chapter on organisation the basic initial and on-going training programmes for licensed and non-licensed personnel should also be defined, establishing the technical competence required for each specific mission, along with the re-training programmes considered suitable. Likewise, the Site Emergency Plan establishes the responsibilities and human resources required to address emergency situations.

The fact that the changes to the Operating Regulation of a facility are subject to a formal process of approval facilitates tracking and control by the CSN of any change in the organisation and in the management of the facility that might negatively affect its safety.

✓ **Personnel qualification – Legal Framework**

According to the new wording of article 37 of the NEA:

> *"The personnel of nuclear and radioactive facilities should fulfil the conditions of suitability established in the corresponding regulation, and shall necessarily undergo the medical check-ups or other checks determined in the regulations in order to verify such compliance.*
>
> *At nuclear facilities there shall be an Operations Manager meeting the conditions established in the regulations; he shall be responsible for supervising all usage and operation of the facility and shall be technically responsible for its operation.*
>
> *The Operations Manager shall be empowered to suspend the operation of the facility if he considers it appropriate or necessary".*

The RNRF also establishes that occupying the posts of Head of the Radiological Protection Service and Supervisor and Operator of nuclear or radioactive facilities requires the possession of specific licences. Each of these licences is personal, entitles the bearer to perform work at a given facility and is granted by the CSN following an examination presided over by a Tribunal appointed by the CSN[1] and designed to demonstrate the competence of the candidates to undertake responsibility for the corresponding service or technical unit or as Head of the Radiological Protection Service.

Once the facilities enter into operation, the CSN performs periodic inspections aimed mainly at checking the academic background, experience and training required for each job post, the basic training in radiological protection of all the operators and the scope of the retraining programmes, verifying that they cover changes to the standards, design modifications and relevant operating experience. The licensees are required to submit an annual report to the CSN summarising the main initial and on-going training activities of their personnel and relating to nuclear safety or radiological protection.

At present, a two-yearly programme of inspections of these staff or off-site licensed or non-licensed personnel training programmes allows a high degree of confidence to be maintained as regards the licensees' training activities.

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

As pointed out in the Third National Report, the 2008 revision of the RNRF focuses specifically on aspects relating to personnel qualification.

✓ **Human resources available at ENRESA**

Within the context of their organisation, the nuclear and radioactive facilities have adequate personnel for the radioactive waste management activities carried out at their sites, which are generally a relatively minor part of the overall activities.

As pointed out in Section A.3 of the Third National Report, the case of ENRESA is different, due to its being a company created specifically for the final management of the radioactive wastes generated in the country, the dismantling of installations, activities relating to both and management of the funds required for all such activities.

As of December 31st 2010, ENRESA had a workforce of 308 persons, of whom 167 are employed at the company's Madrid headquarters, 124 at the El Cabril disposal facility and 4 in the Vandellós 1 NPP dismantling and decommissioning project. The substantial variation that has occurred with respect to the Third National Report is due to the need for personnel associated with the fact that ENRESA has been appointed as Responsible Operator during the dismantling and decommissioning of the José Cabrera NPP, for which ENRESA has a team of 13 people on site.

22.2. Availability of financial resources

The national radioactive waste and spent fuel management system not only clearly assigns responsibilities but also includes a system for the financing of activities performed by ENRESA within the framework of the corresponding GRWP, the realm of responsibility of which also includes the dismantling and decommissioning of nuclear facilities.

As has been pointed out in Section A of this report, and has also been explained in Section E, Article 19 (regulatory legislative framework), the regulation concerning provisions for the Fund for the financing of activities included in the GRWP has recently undergone major changes. These come about specifically through the enactment of Law 11/2009, of October 26th, and its partial modification with the approval of the Sustainable Economy Act, which establishes modification of the Nuclear Energy Act, Law 25/1964, and the Electricity Industry Act, Law 54/1997.

The costs of managing radioactive waste, referred to in the first paragraph, are financed in accordance with Law 11/2009 through the so-called Fund for the financing of activities included in the GRWP, which is fed with revenues from the fees indicated below, including the financial yield generated by them.

All the costs relating to the technical activities and support services required to undertake the activities contemplated in the GRWP, including those corresponding to structural costs and R&D activities and projects, are applied to the Fund.

1. Fee relating to the electricity tariff (tolls)

   This constitutes the route for financing of the costs corresponding to the management of the radioactive wastes and spent fuel generated at those nuclear power plants that were definitively shut down prior to January 1st 2010, including their dismantling and decommissioning, the future costs corresponding to nuclear power plants or fuel assembly manufacturing facilities that, such facilities having been definitively shut down, were not foreseen during their operation, and those that, where appropriate,

might arise as a result of the early shutdown of the facility for reasons not attributable to the licensee.

Also included in this fee are the quantities set aside to cover the part of the Fund for the financing of the costs of managing radioactive wastes arising as a result of research activities determined by the MITYC 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 July 4th 1984, the costs arising from the reprocessing of spent fuel sent abroad prior to the entry into force of the corresponding Law and those other costs that are specified by Royal Decree.

2. Fee relating to Nuclear Power Plants

   This constitutes the route by which all costs incurred as from January 1st 2010 and corresponding to the management of radioactive wastes and spent fuel generated by the operating nuclear power plants will be financed by the licensees of the said plants during such operation, regardless of the date of generation, along with those corresponding to dismantling and decommissioning.

   Also financed by the licensees of the nuclear power plants will be the assignments for municipalities affected by nuclear power plants or spent fuel or radioactive waste storage facilities, in the terms set out by the MITYC, along with the amounts corresponding to taxes levied in relation to radioactive waste and spent fuel storage activities, regardless of the date of generation.

3. Fee relating to the Juzbado Fuel Assembly Manufacturing Facility

   This covers the rendering of management services for radioactive wastes arising from the manufacturing of fuel assemblies, including the dismantling of the manufacturing facilities.

4. Fee relating to other facilities

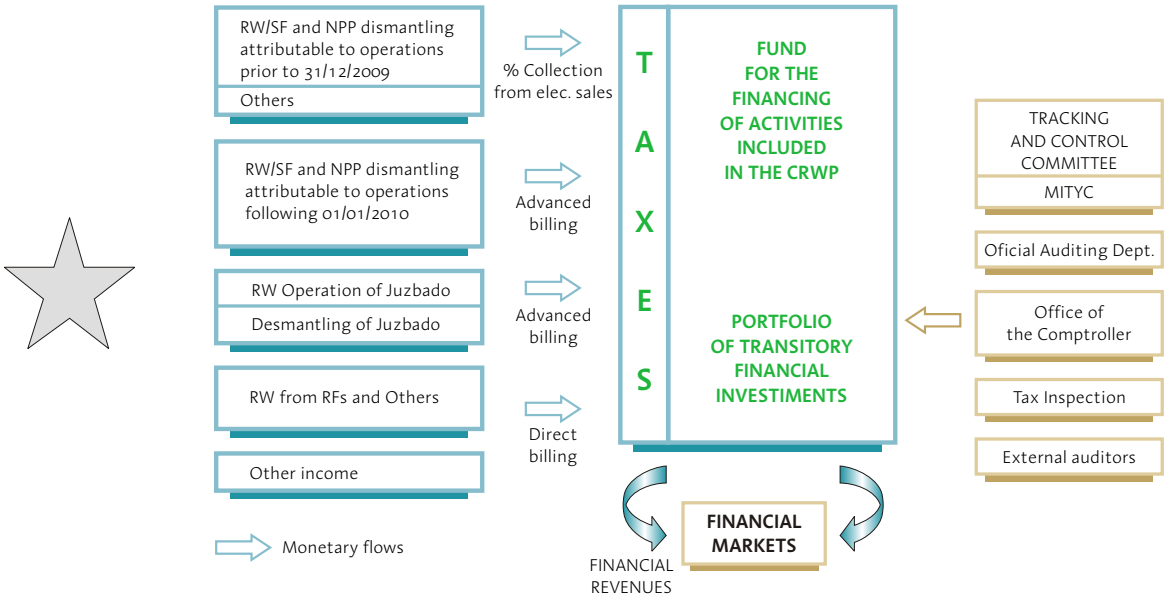
   Fee for the rendering of services covering the management of radioactive wastes generated at facilities other than those indicated above, such as radioactive facilities (medicine, industry, agriculture and research), CIEMAT or other companies. In all these cases the costs are applied directly at the moment of rendering of the services.

   As pointed out in the Third National Report, the provisions to the Fund may be used only to cover the costs of activities contemplated in the GRWP and on the conclusion of the radioactive waste management and facility dismantling period contemplated in the GRWP, the total amounts deposited in the Fund via the different financing channels should cover the costs incurred, such that the final resulting balance be zero.

   The management of the Fund created, which is the responsibility of ENRESA, is governed by principles of security, profitability and liquidity, and there is a Tracking and Control Committee, attached to the MITYC, responsible for the supervision, control and qualification of transitory investments.

   Within the framework of its obligations deriving from Royal Decree 1349/2003, ENRESA is required to submit annually to the MITYC an updated economic-financial report on the cost of the activities contemplated in the GRWP.

   The following diagram gives a general idea of the different revenues for the financing of the activities included in the GRWP and of the mechanisms for their control:



Article 23
Quality assurance

Article 23. Quality assurance

Each Contracting Party shall adopt the measures necessary to ensure the establishment and application of adequate quality assurance programmes in relation to safety in the management of spent fuel and radioactive wastes.

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

All activities relating to the management of spent fuel and radioactive waste are subject to a quality assurance programme (QAP). The licensee of the authorisation for the regulated facility or activity is responsible for establishing and implementing the QAP. QAP's are required to comply with standard UNE 73-401 "Quality assurance at nuclear facilities", the requirements of which are equivalent to those of Appendix B of the USNRC's 10 CFR50 and to those of the IAEA 50-C/SG-Q codes and guidelines on quality assurance at nuclear power plants and other nuclear facilities. The quality assurance standards of the country of origin of the project and the guidelines and codes issued by the IAEA may also be acceptable for the establishment of quality assurance programmes. The CSN has issued several safety guides to facilitate the implementation of the QAP's.

The management of spent fuel and radioactive waste and the design, construction and operation of individualised spent fuel temporary storage (ITS) facilities at nuclear power plant sites are included within the scope of the quality assurance programmes of these installations, which are required to meet the requirements of the UNE 73 401 standard.

In 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 country of origin of the design are applied, such as for example I0 CFR 72, Licensing requirements for the independent storage of spent nuclear fuel, high-level radioactive waste, and reactor-related greater than class c waste, subpart G "Quality assurance requirements" and I0 CFR 7I, Packaging and transportation of radioactive material, subpart H "Quality assurance requirements".

In November 2008, the Nuclear Safety Council issued its Instruction IS-19, on the requirements applicable to systems for the management of nuclear facilities throughout their lifetime. Among others, this IS-19 is applicable to facilities relating to the management of spent fuel and radioactive waste.

IS-19 endorses the IAEA Safety Requirements N0. GS-R-3 "The Management System for Facilities and Activities", and in addition establishes that the quality system shall meet the requirements of the UNE 73 401:1995 standard: "Quality Assurance at nuclear facilities" and complements the requirements relating to independent external assessments, Self-Assessment and Corrective Actions Programme. It is applicable to all Nuclear Facilities throughout the entire life cycle, i.e. from site selection to dismantling and decommissioning. The requirements defined integrate aspects relating to nuclear and radiological safety, the prevention of occupational risk, the environment, security, quality and economics, the aim being to ensure the protection of persons and the environment.

In 2008 a mixed CSN-Licensees working group was set up to analyse the milestones and the actions to be performed to implement the Management System before 1-01-2010, the date of entry into force of this Safety Instruction. This working group drew up a guideline for the writing of Management System Manuals, including the definition of scopes and the appropriate conceptual clarifications, which has served as an aid for the implementation of the Management System. Likewise, the licensees of the facilities identified their situation regarding compliance with the requirements of IS-19, highlighting the additional actions to be performed to fulfil IS-19 and establishing terms for their implementation throughout 2009.

During 2009 the CSN held meetings with ENRESA for tracking of the implementation of the additional actions for compliance with IS-19 at the nuclear facilities of which Enresa is or is going to be the licensee. The aforementioned IS entered into force on January 1st 2010.

This change in the standards has meant the implementation of an integrated system at the El Cabril centralised low and intermediate level waste disposal facility and the beginning of such implementation in the case of the dismantling of the José Cabrera Nuclear Power Plant, the full implementation of the management system is foreseen for the moment in which dismantling of the active parts begins. In the case of the Vandellós nuclear power plant, which is in the dormancy phase, it will be applied once the third stage for definitive dismantling has been initiated; nevertheless, the aspects managed corporatively in accordance with IS-19 will also be applied in the management of this phase of the life cycle.

At the two facilities where it has been developed or is in the development stage, the implementation of this management system has meant a series of changes in management, the most significant being the unification and graduation of the requirements, the drawing up of an integrated management manual, the setting up of a management committee bringing together all the functions of the committees corresponding to the systems that make up the management system, the

establishment of process-based management and the implementation of a safety culture assessment and improvement programme.

This new system also implies certain novelties in the assessment of management, through self-assessment or the implementation of a corrective actions programme accessible to the entire organisation and covering incidents occurring during normal activities and maintenance, graduating these on the basis of their safety significance; this same application also includes the commitments with the regulatory body.

23.2. Quality assurance programme and management system inspection and assessment

There have been no changes in the systematic approach to assessing and inspecting the quality assurance programmes applicable to the management of spent fuel and radioactive waste described in previous reports.

During the period corresponding to the fourth national report, assessment activities have been performed with respect to the quality plans for the design and construction of the Individualised Temporary Storage (ITS) facility for Ascó NPP and for the design and manufacturing of the storage and transport casks for the spent fuel from this plant. Assessment activities have also been carried out with respect to the quality assurance programme for the dismantling of the José Cabrera nuclear power plant installations, along with various changes to the quality assurance programme for the El Cabril centralised low and intermediate level solid waste disposal facility.

As regards the inspection activities carried out during this period, mention may be made of the two-yearly inspections of the El Cabril quality assurance programme, an inspection of the quality assurance programme for the dismantling of José Cabrera NPP, two annual inspections of the quality assurance programmes of radioactive materials transport companies and one inspection of the quality plan for the design and manufacturing of irradiated fuel casks at ENSA.

Article 24
Operational radiological protection

Art. 24. Operational Radiological Protection.

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

   i) *The radiological exposure of the workers and the public caused by the facilities is reduced to the lowest level reasonably achievable, taking into account economic and social factors;*

   ii) *No person is exposed, in normal situations, to radiation doses in excess of the national dose limitation prescriptions, with due account given to internationally approved radiological protection standards;*

   iii) *Measures are adopted to prevent non-planned and uncontrolled emissions of radioactive materials to the environment.*

2. *Each Contracting Party shall adopt adequate measures to ensure releases are limited such that:*

   i) Exposure to radiations is kept as low as reasonably achievable, taking into account economic and social factors;

   ii) No person is exposed, in normal situations, to radiation doses in excess of the national dose limitation prescriptions, with due account given to internationally approved radiological protection standards;

3. *Each Contracting Party shall adopt adequate measures to ensure that, during the operating lifetime of a regulated nuclear facility, and in the event of there being a non-planned or uncontrolled emission of radioactive materials to the environment, appropriate corrective measures are applied to control the emission and mitigate its effects.*

The provisions of Spanish law that refer to radiological protection are included fundamentally in Law 15/1980, of April 22nd, creating the CSN, modified by Law 33/2007, of November 7th, and in the Regulation on the Protection of Health against Ionising Radiations (RPHIR), approved by Royal Decree 783/2001, of July 6th 2001.

The law creating the CSN assigns to this organisation the functions of surveillance and control of the levels of radioactivity inside and outside Spanish nuclear and fuel cycle facilities, as well as of their specific or cumulative impacts on the areas in which they are located, the control of the doses received by the 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 professionally exposed workers and the members of the public against the risks of exposure to ionising radiations are established in Royal Decree 783/2001 which approves the Regulation on the Protection of Health against Ionising Radiation.

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

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

As an additional development of the provisions of the aforementioned Regulation, the Nuclear Safety Council has published several provisions of 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.

- ✓ Instruction IS-02, revision 1 of July 21st 2004, regulating the documentation on refuelling activities at nuclear power plants requires the following of the plant licensees:
  - ➪ That prior to initiating the refuelling, they submit a report to the CSN with a detailed estimate of the occupational doses foreseen, with detailed information on the dose reduction techniques to be applied with a view to fulfilling the ALARA principle.
  - ➪ That within the three months following the refuelling they submit a report to the CSN with information on the occupational doses received during the said refuelling, in accordance with a dose-task table in keeping with the NEA1 format of the ISOE (International System of Occupational Exposure).

- ✓ Instruction IS-03, of November 6th 2002, on the qualifications required to receive recognition as an expert in radiological protection, establishes the requirements relating to the qualification and initial and on-going training that are to be met by the personnel of Radiological Protection Services, both the Head of the Service and its qualified experts.
- ✓ Instruction IS-04, of February 5th 2003, which regulates the filing and custody of documents relating to the radiological protection of the workers and the public, establishes the mechanisms by which the nuclear power plants are to transfer these documents to the CSN following their definitive shutdown and on completion of decommissioning.
- ✓ Instruction IS-06, of April 9th 2003, which defines the training programmes on basic and specific radiological protection regulated in the field of nuclear and fuel cycle facilities, establishes the content, scope and requirements to be met by the instructors delivering basic and specific training courses for contractor company workers.
- ✓ Instruction IS-20, of January 28th 2009, sets out the safety requirements relating to spent fuel storage casks, develops the nuclear safety and radiological protection requirements for the design of spent fuel casks and determines the contents of the documentation to be submitted for approval, in order to guarantee adequate coordination between the licensees involved in the design/manufacturing and use of these casks, since the responsible parties may be different in each stage.
- ✓ Instruction IS-29, of October 13th 2010, on safety criteria at spent fuel and high level radioactive waste temporary storage facilities, encompasses the basic objectives of spent fuel and high level waste management, the basic principles of radiological protection, basic safety functions, design criteria, basic operating requirements and safety assessment of this type of facilities, taking into account the principles of good practice in engineering and the current state of the art as regards technology.

24.1. Protection of the workers

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

In 1977 the International Commission on Radiological Protection (ICRP) approved a set of basic recommendations (publication No 26) that implied the entry into force of a radiological protection system based on three basic principles: justification, optimisation and limitation of individual doses, this being endorsed and reinforced in the new ICRP recommendations adopted in 1990 (Publication No 60).

These three basic principles are incorporated in the Spanish legislation in the aforementioned Regulation on the Protection of Health against Ionising Radiations.

The principle of optimisation, which is recognised as being hierarchically superior to the other two principles, constitutes the fundamental basis of the current doctrine of radiological protection, and is formulated in the following terms: *"The individual doses, the number of persons exposed and the probability of there being potential exposures should be kept at the lowest value reasonably possible, taking into account economic and social factors"*.

The application of this principle requires, among many other aspects, that special attention be paid to each and every one of the radiological protection measures aimed at preventing exposure to radiations, which are based fundamentally on the following:

- ✓ Assessment (prior to implementation) of the radiological risk associated with each activity involving the use of ionising radiations.
- ✓ The radiological classification of the workers involved, depending on the radiological risk inherent to the work to be performed as part of that activity.
- ✓ The radiological classification of the work places, depending on the levels of radiation and contamination foreseeable as a result of that activity.
- ✓ The application of standards and control measures adequate for the different categories of exposed workers and the different places of work.

These preventive measures are included in the radiological protection manuals, which are one of the official operating documents of nuclear and nuclear fuel cycle facilities. These radiological protection manuals require the favourable appreciation of the Nuclear Safety Council prior to their initial entry into force.

Thus, in the nuclear power sector the practical application of the principle of optimisation (or ALARA principle) is accomplished by establishing a systematic approach for the revision of the radiologically most relevant jobs, with identification of the tasks implying the greatest radiological risk, the preparation and planning of these tasks, their monitoring for the identification and control of deviations to the aforementioned planning and, if appropriate, the implementation of the necessary corrective actions. Finally, a subsequent revision of the work is performed, analysing any deviations and their causes in order to establish future lines for improvement.

The current trend in the technologically developed nations is to consider that the efficient implementation of the ALARA principle requires a serious commitment to and motivation with this principle by all the members of the plant organisation, from the highest levels of Management to those actually performing the work, and including all the levels of management in the different departments of the organisation related to occupational doses. For this reason, since the early 1990's the Spanish nuclear power plants have been modifying their operating organisations in order to ensure that all their elements are seriously and formally committed to compliance with this principle.

In keeping with these new trends in the practical application of the optimisation of radiological protection, the CSN has dedicated its efforts since 1991 to defining patterns and criteria to ensure this commitment and promote a doctrine whose bases are established in CSN Safety Guide 1.12, "Practical application of the optimisation of radiological protection in the operation of nuclear power plants". Implementation has followed the general scheme described below:

1. A top management level responsible for promoting and approving the ALARA culture and dose objectives and for providing the resources required to carry out this policy.
2. A middle management level of executives responsible for proposing the ALARA policy and dose objectives and for revising initiatives and analysing the results obtained, taking corrective actions.
3. A level of technicians responsible for performing the analysis, planning and tracking of tasks and revising the results obtained, as well as for proposing improvement actions.

The implementation of this doctrine has meant important modifications in the operating organisations of the Spanish nuclear power plants, where multidisciplinary committees have been set up, with the participation of the managers of the different plant departments, especially oriented

towards the efficient implementation of the ALARA principle. These committees meet periodically to specify and plan the actions required to fulfil this objective, with special attention to those plant activities that are most significant from the radiological point of view.

As in the case of the nuclear power plants, the fuel cycle and waste storage facilities have Dose Reduction Programmes and the organisational structures required for the efficient implementation of the ALARA principle, these logically being adapted to the specific characteristics and intrinsic radiological risks of such installations.

24.1.2. Measures adopted to ensure that no worker is exposed, in normal situations, to radiation doses in excess of the national dose limitation prescriptions, with due account given to internationally approved radiological protection standards

The Regulation on the Protection of Health against Ionising Radiations establishes the following dose limits for the professionally exposed workers of 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.

One of the functions assigned to the CSN is the control of the radiation doses received by the operating personnel of the Spanish nuclear and fuel cycle facilities.

In most cases, the control of the radiation doses received by professionally-exposed workers is accomplished through individual surveillance by passive physical dosimeters. There are cases, however, in which, if the radiological risk is sufficiently low, the radiological surveillance of the environment in which the workers perform their work activities may suffice.

In Spain the dosimetric surveillance of workers exposed to ionising radiations is regulated by the aforementioned Regulation, which provides that individual dosimetry is to be undertaken by Personnel Dosimetry Services expressly authorised by the CSN.

In compliance with this function, the CSN established in Safety Guide 7.1 (Technical-administrative requirements for Individual Personal Dosimetry Services), the technical and administrative requirements to be met by entities wishing to be officially authorised as Personal Dosimetry Services. The CSN also established the tests required to accredit the adequate operation of the dosimetry services and associated acceptance criteria.

The regulatory provisions established in the Regulation on the Protection of Health against Ionising Radiations determine that a dosimetry history file should be opened for each professionally-exposed worker, to include all the doses received by such workers throughout their working lifetime. These provisions assign to the licensee of the practice the responsibility for maintaining such files until the worker reaches the age of 65 years and never for less than 30 years as from the date of retirement of the worker.

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

The NDB is a fundamental tool for the regulatory control of the doses received by these workers and allows for the following:

- ✓ Availability of updated information on the dosimetry histories of each of the workers.
- ✓ Performance of sector-specific statistical studies of radiation exposure trends of different groups of workers, this allowing for the identification of areas of interest from the point of view of the ALARA principle.
- ✓ Study of the doses resulting from the operation of any nuclear or radioactive facility in Spain.

On closure of the dosimetry year 2010, there were records of approximately 16.771.437 dosimetry measurements in the NDB, corresponding to some 295.796 and some 53.293 installations. Each of these measurements was accompanied by information on the type of facility and the work performed by the worker.

Particularly noteworthy is the fact that, although the maximum regulatory effective dose for professionally exposed personnel in any one calendar year is 50 mSv:

- ✓ 99.63% of the dosimetrically controlled workers (103,552) received doses lower than 6 mSv/year.
- ✓ 99.97 % of the dosimetrically controlled workers (103,906) received doses lower than 20 mSv/year.

This distribution underlines the positive trend shown by the Spanish nuclear and fuel cycle facilities as regards compliance with the dose limits (100 mSv over five years) established in the Regulation on the Protection of Health against Ionising Radiations.

Personal dosimetry

With regard to the dosimetry results corresponding to 2010 for the nuclear power plants overall, it should be pointed out that there were a total 9,286 professionally exposed and dosimetrically controlled workers in this area. The dosimetry readings reflected a collective dose of 3,036.81 mSv.person, the overall average individual dose for this group being 0.93 mSv/year, calculation of this parameter considering only workers with significant doses[1].

The main contribution to collective dose in this sector corresponded to contracted personnel (2,679.43 mSv.person), with a total of 7,260 workers and an average individual dose of 0.97 mSv/year. In the case of the plant personnel, the collective dose was 357.38 mSv.person, with a total 2,172 workers and an average individual dose of 0.75 mSv/year.

The dosimetry results for 2010 at the Spanish nuclear power plants are shown in table 7:

Table 7.

	Overall	Plant Staff	Contracted
No of exposed workers	9,286	2,172	7,260
Collective dose (mSv*person)	3,036.81	357.38	2,679.43
Average individual dose (mSv/year)	0.93	0.75	0.97

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

In 2010 there were 535 professionally exposed workers carrying out activities at the Juzbado fuel assembly manufacturing facility. The dosimetry readings implied a collective dose of 68 mSv.person. If only the workers with significant doses are considered, the average individual dose for this group amounts to 0.67 mSv/year.

The dosimetry results for 2010 at the Juzbado fuel assembly manufacturing facility are shown in table 8:

Table 8.

No of exposed workers	535
Collective dose (mSv*person)	68
Average individual dose (mSv/year	0.67

In 2010 there were 221 professionally exposed workers carrying out activities at the El Cabril radioactive waste disposal facility. The dosimetry readings implied a collective dose of 3.84 mSv.person. If only the workers with significant doses are considered, the average individual dose for this group amounts to 0.26 mSv/year.

The dosimetry results for 2010 at the El Cabril radioactive waste disposal facility are shown in table 9:

Table 9.

No of exposed workers	221
Collective dose (mSv*person)	3.84
Average individual dose (mSv/year)	0.26

24.2. Protection of the public

The Regulation on the Protection of Health against Ionising Radiations expressly requires that the exposure to which members of the public are subjected as a result of a justified practice should be kept as low as reasonably achievable, taking into account economic and social factors (ALARA). This philosophy is applied in both the licensing and operating, dismantling and decommissioning phases of Spanish nuclear facilities in general, and spent fuel and radioactive waste storage facilities in particular, as is set out in the official operating documentation of each.

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

- ✓ Effective dose limit of 1 mSv per calendar year. Nevertheless, in special circumstances a higher effective dose value may be authorised in a single calendar year, as long as the average over five consecutive calendar years does not exceed the aforementioned value.

✓ Notwithstanding the above, an equivalent dose 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. Limitation of releases at nuclear facilities

The operating permits of all Spanish nuclear facilities establish, as part of the Operating Technical Specifications (OTS's), the system for the limitation, surveillance and control of radioactive effluents.

At the nuclear power plants, the detailed development of this radioactive effluent limitation, surveillance and control system are included in the Dose Calculation Manual (DCM), this not being the case at the El Cabril waste disposal facility, where they are dealt with in the Specifications document itself.

An effective dose limit of 0.1 mSv/year is applied to nuclear power plants, both during operation and in the phase of dismantling, considered for periods of twelve consecutive months. This value, which corresponds to the overall effluents emitted by each of the site groups, is applicable to the overall liquid and gaseous radioactive effluents released.

An interesting aspect is the fact that at the Spanish nuclear power plants the water in the irradiated fuel storage pools does not constitute a make-up to the liquid radioactive effluent treatment systems.

At the José Cabrera plant, which was definitively shut down on April 30th 2006, the limits that were in force during the operation of the facility have continued to be applicable. These same limits will remain in force throughout the dismantling of the plant, which was authorised on February 1st 2010.

At the El Cabril disposal facility, the criterion of zero releases is applied for liquid radioactive effluents. At this installation only gaseous radioactive effluents are emitted to 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 the Spanish nuclear facilities are required to estimate the accumulated dose for the critical member of the public for 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 MCDE methodology on the basis of highly conservative criteria, with a view to verifying compliance with the established limits.

Since 2008 the accounting of the activities obtained by applying the aforementioned sampling and analysis programmes has been carried out in accordance with the criteria of recommendation 2004/2/Euratom, relating to standardised information on the gaseous and liquid radioactive effluents released to the environment by nuclear power plants and re-elaboration facilities under normal operating conditions.

The results of the sampling and analysis programmes and 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 with respect to the reference group, taking more realistic criteria into account. The reference groups are equivalent to the critical groups, as described in publication ICRP-60.

In accordance with the OTS's, the licensees carry out environmental radiological surveillance programmes (ERSP's) in the areas of influence of nuclear facilities. The results of the ERSP's,

which are submitted annually to the CSN, allow insight to be gained into the true environmental impact of the releases.

24.2.3. Control of releases

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

In keeping with the Regulation on Nuclear and Radioactive Facilities, the licensees are required to implement an on-going improvement Programme in accordance with the evolution of the applicable standards, technological progress and operating experience. Specifically, Article 8.3 of the said regulation establishes that the licensees must continuously oversee the improvement of the radiological protection conditions of their facility and, in this respect, 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 adequate in the opinion of the latter.

Likewise, the licensees of the 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.

Furthermore, for the liquid and gaseous effluents from the Spanish nuclear power plants the CSN has defined a series of "reference levels", expressed in terms of the activity of groups of nuclides, which indicate the optimum operation of the reactor in relation to the generation of radioactive wastes and environmental releases.

Consequently, as regards the control of radioactive effluents the Spanish regulatory system constitutes an adequate framework for the efficient application of a clearly established policy that requires the implementation of the applicable technological progress, that complies with the requirements and recommendations of the competent international organisations and that incorporates the measures required to ensure that releases are limited and that the impact on the public and the environment is minimised.

The releases from the Spanish nuclear power plants and from the El Cabril disposal facility in 2008, 2009 and 2010 are summarised in Tables 10 and 11, respectively.

In the case of José Cabrera nuclear power plant, the effluents that have been released since the shutdown of the plant have been generated as a result of the tasks performed in preparation for dismantling.

These releases represent a minimum risk for the members of the public and for the population overall, as may be deduced from the doses due to the releases for the two years considered, which have not exceeded 7.5% in the case of the Spanish nuclear power plants and 24.5% in the case of the El Cabril disposal facility, in both cases with respect to the authorised release limit.

Table 10.
Activity of radioactive effluents from the Spanish nuclear power plants (Bq).

	PWR Plants						BWR Plants	
	José Cabrera [1] 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								
2008								
Total except Tritium and Gases	1,64 x 10^{8}	6,24 x 10^{9}	3,49 x 10^{9}	8,24 x 10^{9}	8,27 x 10^{9}	9,20 x 10^{8}	1,65 x 10^{8}	1,32 x 10^{8}
Tritium	1,28 x 10^{11}	2,58 x 10^{13}	2,60 x 10^{13}	4,28 x 10^{13}	1,99 x 10^{13}	1,59 x 10^{13}	4,87 x 10^{11}	3,93 x 10^{11}
Dissolved Gases	- -	LID	1,96 x 10^{7}	7,81 x 10^{8}	2,14 x 10^{7}	(2)	4,40 x 10^{7}	9,42 x 10^{8}
2009								
Total except Tritium and Gases	6,73 x 10^{7}	1,08 x 10^{10}	6,79 x 10^{9}	3,31 x 10^{9}	7,54 x 10^{9}	9,53 x 10^{8}	4,85 x 10^{8}	1,83 x 10^{8}
Tritium	2,57 x 10^{11}	2,74 x 10^{13}	2,21 x 10^{13}	2,43 x 10^{13}	6,23 x 10^{12}	2,02 x 10^{13}	5,46 x 10^{11}	6,35 x 10^{11}
Dissolved Gases	- -	LID	2,46 x 10^{8}	1,55 x 10^{8}	1,15 x 10^{8}	(2)	1,28 x 10^{7}	5,51 x 10^{6}
2010								
Total except Tritium and Gases		3,47 x 10^{9}	3,17 x 10^{9}	3,42 x 10^{9}	3,19 x 10^{9}	7,70 x 10^{8}	2,66 x 10^{8}	9,42 x 10^{7}
Tritium		3,72 x 10^{13}	2,07 x 10^{13}	1,90 x 10^{13}	2,80 x 10^{13}	2,06 x 10^{13}	6,67 x 10^{11}	1,88 x 10^{11}
Dissolved Gases		1,38 x 10^{8}	3,12 x 10^{7}	5,29 x 10^{7}	9,07 x 10^{7}	(2)	LID [3]	1,29 x 10^{7}
Gaseous Effluents								
2008								
Noble Gases	LDL [3]	3,87 x 10^{13}	2,67 x 10^{12}	3,36 x 10^{12}	9,61 x 10^{12}	3,77 x 10^{11}	1,87 x 10^{13}	2,74 x 10^{13}
Halogens	LDL [3]	5,55 x 10^{7}	LID [3]	1,92 x 10^{6}	1,11 x 10^{7}	LDL [3]	5,56 x 10^{9}	5,20 x 10^{9}
Particles	4,78 x 10^{6}	9,28 x 10^{6}	7,80 x 10^{6}	7,27 x 10^{6}	7,13 x 10^{6}	3,83 x 10^{6}	9,22 x 10^{7}	2,40 x 10^{8}
Tritium	1,43 x 10^{10}	2,95 x 10^{12}	1,25 x 10^{12}	1,08 x 10^{12}	1,80 x 10^{11}	8,77 x 10^{11}	1,31 x 10^{12}	5,01 x 10^{11}
Carbon-14 [4]	- -	1,42 x 10^{11}	7,42 x 10^{11}	9,15 x 10^{11}	1,49 x 10^{11}	3,03 x 10^{10}	2,43 x 10^{11}	3,09 x 10^{11}

	PWR Plants						BWR Plants	
	José Cabrera NPP [1]	Almaraz I y II NPP	Ascó I NPP	Ascó II NPP	Vandellós II NPP	Trillo NPP	Sta. Mª Garoña NPP	Cofrentes NPP
2009								
Noble Gases	LDL[3]	1,08 x 10^{13}	2,82 x 10^{12}	2,58 x 10^{12}	3,76 x 10^{11}	1,89 x 10^{12}	2,93 x 10^{13}	2,08 x 10^{13}
Halogens	LDL[3]	6,99 x 10^{4}	LDL[3]	2,17 x 10^{5}	1,90 x 10^{8}	3,63 x 10^{7}	1,54 x 10^{9}	9,11 x 10^{9}
Particles	LDL[3]	2,10 x 10^{6}	7,02 x 10^{6}	7,25 x 10^{6}	2,53 x 10^{7}	1,48 x 10^{6}	1,12 x 10^{8}	2,41 x 10^{8}
Tritium	6,55 x 10^{9}	3,17 x 10^{12}	4,23 x 10^{11}	4,13 x 10^{11}	3,48 x 10^{11}	8,52 x 10^{11}	1,06 x 10^{12}	3,62 x 10^{11}
Carbon-14[4]	- -	2,53 x 10^{11}	1,98 x 10^{11}	3,08 x 10^{11}	5,36 x 10^{10}	3,69 x 10^{10}	2,31 x 10^{11}	2,89 x 10^{11}
2010								
Gases Nobles		1,13 x 10^{13}	2,67 x 10^{12}	3,01 x 10^{12}	1,74 x 10^{11}	3,06 x 10^{12}	1,13 x 10^{13}	1,82 x 10^{13}
Halogens		1,07 x 10^{5}	LDL[3]	LDL[3]	5,00 x 10^{7}	2,45 x 10^{7}	1,35 x 10^{9}	1,20 x 10^{10}
Particles		2,03 x 10^{6}	5,87 x 10^{6}	4,36 x 10^{6}	9,09 x 10^{6}	9,98 x 10^{5}	1,31 x 10^{10}	1,45 x 10^{8}
Tritium		3,72 x 10^{12}	3,31 x 10^{11}	8,83 x 10^{11}	4,65 x 10^{11}	6,90 x 10^{11}	6,59 x 10^{11}	6,03 x 10^{11}
Carbon-14[4]		2,71 x 10^{11}	1,29 x 10^{11}	3,27 x 10^{11}	4,99 x 10^{10}	3,60 x 10^{10}	1,14 x 10^{11}	3,60 x 10^{11}

[1] Plant definitively shut down since April 30th 2006. The effluents released correspond to tasks performed prior to dismantling.

[2] No dissolved gases are entrained in the liquid releases since they are eliminated during the treatment process.

[3] LDL: Lower Detection Limit

[4] Determined since 2008.

Table 11.
Activity of radioactive effluents from El Cabril (Bq).

Gaseous effluents	Total Alpha	Total Beta	Gamma	Tritium	Carbon-14
2008	4,71 x 10^{3}	1,29 x 10^{5}	LID	1,25 x 10^{9}	6,27 x 10^{8}
2009	8,16 x 10^{3}	1,17 x 10^{5}	LID	4,55 x 10^{9}	1,62 x 10^{9}
2010	5,41 x 10^{3}	1,39 x 10^{5}	LID	9,06 x 10^{8}	2,46 x 10^{8}

24.2.4. Unplanned or uncontrolled releases

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

- ✓ Monitoring instrumentation allowing such releases do be detected.

- ✓ Release isolation devices for use when certain previously established values are exceeded.
- ✓ Activation of alarms in the event of abnormal conditions being detected.
- ✓ Administrative controls.

If, however, despite these measures an uncontrolled or unplanned release occurs, the licensees of the nuclear facilities must adopt the measures required to interrupt or control this release, if possible, and to minimise its impact off site. Likewise, they are required to identify the underlying cause or causes and define the actions to be implemented to avoid recurrence. All these aspects must be reported to the CSN for analysis and approval.

The ERSP's performed by the licensees of the nuclear facilities make it possible to identify any increase in environmental activity as a result of these releases and check 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 prior to and during the operation of a spent fuel or radioactive waste management facility there are appropriate emergency plans applicable both on site and, if necessary off site. These emergency plans shall be checked at an adequate frequency.*
2. *Each Contracting Party shall adopt adequate measures for the preparation and testing of the emergency plans for its territory, to the extent to which it might be affected by a radiological emergency at a spent fuel or radioactive waste management facility located close to its territory.*

25.1. Assignment of responsibilities in emergency situations

The Basic Nuclear Emergency Plan (PLABEN) establishes the planning and preparation for emergency situations that might arise as a result of accidents in nuclear power plants in operation or in the shutdown phase with spent fuel in storage in their pools.

The Basic Civil Defence Directive on Planning for Radiological Risk (BDRR) is the standard that contains the minimum criteria to be adhered to by the different Public Administrations and, where appropriate, the licensees of regulated nuclear and radioactive facilities, as well as by the licensees of other installations or activities in which there might exceptionally be a radiological risk. Among these would be facilities dedicated to the permanent disposal of low and intermediate level radioactive wastes (El Cabril) and the temporary storage of high level radioactive wastes, both the individualised temporary storage (ITS) facilities currently still under the standards of the PLABEN and the future centralised temporary storage (CTS) facility. The transition from the application of the PLABEN to the application of the BDRR for the ITS facilities will be carried out at a moment to be determined between the authorisation for dismantling and the declaration of decommissioning of the facility, following a report by the CSN and on the ba-

sis of an analysis of the risks of the installation. In this respect, the ITS facility of the José Cabrera nuclear power plant will be transferred to the standards of this BDRR at the moment determined.

Both the PLABEN and the BDRR determine the different competent authorities and public organisations of the State, Regional and Local Administrations concerned in the event of an emergency and in relation to radioactive waste management.

All the waste management installations have Site Emergency Plans. The Off-Site Emergency Plans are drawn up in keeping with the aforementioned standards.

The main competent authorities and public organisations involved are the following:

- ✓ The Ministry of the Interior, which is assigned the responsibilities of the State in all matters relating to civil defence.
- ✓ The Nuclear Safety Council is assigned the responsibilities corresponding to it as the sole competent organisation for nuclear safety and radiological protection.
- ✓ The regional and local Administrations (Autonomous Communities, Town Councils and provincial Government Offices affected by and included in the corresponding Nuclear Emergency Plans) are assigned the responsibilities corresponding to them in relation to civil defence, public security, health, transport and communications, supply and shelter, among others.
- ✓ The Empresa Nacional de Residuos Radiactivos (ENRESA) is responsible for providing support for the civil defence services in the manner and under the circumstances that might be required.

The international bodies acting as intermediaries in the event of an emergency are indicated below, in sub-section 25.5 of the present report.

25.2. Legislative and regulatory framework governing emergency situations

In the Spanish State the planning and preparation for situations of nuclear emergency are governed by the Regulation on Nuclear and Radioactive Facilities, the Law creating the Nuclear Safety Council, the Basic Standards on Civil Defence and Self-Protection and the Royal Decree creating the Empresa Nacional de Residuos Radiactivos S.A. (ENRESA). As has been pointed out above, there is a Royal Decree approving the Basic Nuclear Emergency Plan (PLABEN), a Royal Decree approving the basic civil defence Directive on radiological risk (BDRR) in relation to the Risk of Accidents in the Transport of Hazardous Goods by Road and Rail, which include general provisions on emergencies that might occur in the transport of radioactive materials. On October 7th 2005, the Cabinet of Ministers created the Military Emergency Response (MER) Unit to protect the members of the public in situations of serious risk, catastrophe or calamity, among which would be those arising from emergencies at nuclear and radioactive facilities. The BDRR indicates that the intervention of the Military Emergency Response (MER) Unit must be requested, in compliance with the provisions of the legislation and regulations in force, by the authority appointed for this purpose by the competent organisation of the Autonomous Community.

- ✓ **Basic Standard on Civil Defence**

  This standard, approved by Royal Decree on April 24th 1992, determines the distribution of competences for preparation and planning for emergencies of different

types among the entities making up the Spanish State: the Government of the Nation (competence of the State), the Autonomous Communities and local entities.

✓ **Basic Standard on Self-Protection**

This standard was approved by the Government, in response to a proposal by the Ministry of the Interior, following a report by the National Commission on Civil Defence (including the representation of the Nuclear Safety Council), published in the Official State Gazette by means of Royal Decree 393/2007, of March 23rd 2007.

The basic standard on Self-Protection is applicable to centres, establishments and facilities dedicated to activities that might give rise to emergency situations. As regards nuclear and radioactive installations, it is established that their self-protection plans (site emergency plans) will be regulated in accordance with the requirements of the Regulation on Nuclear and Radioactive Facilities.

✓ **Basic Nuclear Emergency Plan (PLABEN)**

The Basic Nuclear Emergency Plan was approved by the Government, in response to a proposal by the Ministry of the Interior, during the Cabinet Meeting held on June 25th 2004, following a favourable report by the Nuclear Safety Council and the National Commission for Civil Defence, and published in the Official State Gazette (BOE) on July 14th 2004,and has been modified by Royal Decree 1428/2009, of September 11th 2009, published in the BOE on September 12th 2009.

The PLABEN is the guideline, with the ranking of a directive, that contains the essential standards and criteria for the drawing up, effective implementation and maintenance of the efficiency of the civil defence nuclear emergency plans, responsibility for which rests with the General State Administration, with collaboration by the other public Administrations. Its objectives are to reduce the risk or mitigate the consequences of accidents at the point of origin and to prevent, or at least reduce to the extent possible, the adverse effects of ionising radiations for the population and property, for which reason the plan defines the actions foreseen by the Public Authorities to provide a prompt and adequate protection for both. The PLABEN contains the radiological criteria defined by the CSN for the planning of emergency response at nuclear facilities.

As regards practical application, the PLABEN is developed through the following:

- Nuclear Facility Site Emergency Plans (SEP)
- Nuclear power plant off-site nuclear emergency plans (OEP)
- Municipal nuclear emergency action plans (MNEP)
- Response and Support Centre Nuclear Emergency Plan (RSCNEP), which defines the national organisation, structure and functions for emergency situations.

The aforementioned modification provides that the NEP's may name the operating groups in different ways and contemplates the existence of other additional operating groups, as long as compliance with all the functions assigned to them within the framework of the Basic Plan is guaranteed and that the executive body includes a mayor representing each zone I affected by the NEP, to be appointed by the director of the NEP in response to a proposal by the zone I mayors.

✓ **Law Creating the CSN**

Law 33/2007, of November 7th, reforming the law by which the CSN was created, Law 15/1980, of April 22nd 1980, modifies the functions attributed to the CSN, specifically extending the coverage of the CSN's functions in emergency situations.

✓ **Regulation on Nuclear and Radioactive Facilities**

Royal Decree 35/2008, of January 18th 2008, has modified Royal Decree 1836/1999 by the Ministry of Industry and Energy, by which the said Regulation was approved, the latter requiring that in order to obtain the mandatory authorisations for the use or operation of a nuclear or radioactive facility, the applicant draw up and submit an Emergency Plan, which will be approved on granting such authorisations.

In Spain there is no facility having the management of spent fuel as its main objective; there is, however, a facility whose main objective is the management of radioactive wastes, which according to the Spanish regulations is categorised as a nuclear facility. Consequently, like the nuclear power plants, this facility is required to have a Site Emergency Plan, which is currently approved by the Ministry of Industry, Tourism and Trade following a report by the CSN, which assesses this plan in the light of specific national and international standards.

✓ **Royal Decree on the ordering of the activities of the Empresa Nacional de Residuos Radiactivos S.A. (ENRESA).**

Royal Decree 1349/2003, on the ordering of the activities of ENRESA and their financing, assigns to this company the mission of acting in support of the civil defence services, in the manner and circumstances required, in the event of nuclear or radiological emergencies.

✓ **Basic Directive on the Planning of Civil Defence for the Risk of Accidents in the Transport of Hazardous Goods by Road and Rail.**

This Directive, which was approved by Royal Decree 387/1996, of July 1st 1996, establishes the basic elements for the planning for emergencies at State Administration and Autonomous Community level, the situations for the management of emergencies and the coordinating bodies, applicable in the case of accidents in the transport by road and rail of hazardous goods, including radioactive materials (Class VII hazardous goods).

✓ **Basic Directive on the Planning of Civil Defence in response to Radiological Risk.**

This Directive was approved by Royal Decree 1564/2010, of November 19th, to respond to possible accidents, events and circumstances having radiological repercussions that might arise from installations, equipment, radiation sources and activities in which ionising radiations are present for some reason.

In particular, the BDRR is applicable in the drawing up, implementation and maintenance of the efficiency of the special civil defence plans for radiological emergencies in those territorial areas in which this is required.

It will be applicable to the special civil defence plans developed to respond to those radiological emergencies that might arise as a result of the following:

a) Activities or installations habitually using nuclear or radioactive substances.

b) Accidents at facilities and in activities not contemplated in the previous section.

c) Exceptional events arising from illicit activities aimed at causing damage to persons or property.

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

✓ **Site Response Level**

The activities for the preparation for and response to emergency situations at this level are contained in the Site Emergency Plans, these being mandatory documents for application for and granting of the operating Licence for any nuclear or radioactive facility.

The basic objectives of the site response level are as follows:

- To take the situation of the facility or activity to a safe condition.
- To prevent or reduce the dispersal of radioactive material.
- To protect the workers involved at the facility or in the activity and the personnel intervening at the facility.
- To inform the public authorities of any situation requiring the application of protective measures for the population and to collaborate with them in their implementation.
- Both the Site Emergency Plan and the Self-Protection Plan will establish procedures for coordination with the off-site response level plans.

In this respect, the licensee of the facility is responsible for operating the plant correctly, in accordance with its technical specifications and operating procedures for normal and accident situations, and for promptly and accurately notifying the Public Authorities of the occurrence or imminent occurrence of a radiological emergency category.

In the Site Emergency Plans of nuclear power plants, the possible accidents that might occur during their operation are classified in four emergency categories, established depending on the conditions of the plant and taking into account the maximum amount of radioactive material that might be released off site, assuming a conservative evolution of the initiating event: Category I (Emergency Prealert), Category II (Emergency Alert), Category III (Site Emergency) and Category IV (General Emergency).

Analogously, at the low and intermediate level radioactive waste management facility existing in Spain, emergency situations are classified in three categories (I, II and III), in increasing order of seriousness and decreasing order of probability: This classification has been based on the accident and risk analyses performed on the facility, from which it has been deduced that there could be no release of radioactive materials off site in an amount such that the adoption of an emergency plan outside the area controlled by the operator might be necessary.

Within the framework of the BDRR, the site response level actions performed at facilities or in activities in which events or accidents potentially leading to radiological risk situations might occur are the responsibility of the licensees.

The spent fuel generated during the operation of the José Cabrera Nuclear Power Plant having now been transferred to the Individualised Temporary Storage (ITS) facility on site within the dismantling phase, and in view of new security assumptions potentially affecting the casks housed in this facility, the current licensee of the installation, ENRESA, has been asked to revise the SEP in force to incorporate the physical security event mentioned in Category III.

✓ **Off-Site Level of Response**

At this level the activities involved in preparing for and responding to emergencies are established in the following:

- The nuclear power plant off-site Nuclear Emergency Plans, which are in turn developed in the action procedures of the different operating groups and include, among other things, the municipal nuclear emergency action plans.
- The Central Response and Support Level configures the model for response at national level for the mobilisation of the resources and capabilities of the Spanish State and the coordination of whatever international aid might be necessary.

  The management of national resources to support the off-site Nuclear Emergency Plans is carried out through the Directorate General for Civil Defence and Emergencies (DGVD&E), belonging to the Ministry of the Interior, as the organisation in charge of coordinating all the necessary support from the different Bodies of the central and other Administrations, and the Nuclear Safety Council (CSN) for all aspects relating to nuclear safety and radiological protection, the latter coordinating in turn all the different public or private organisations and companies whose participation is necessary to attend to the specific functions attributed to it.
- In the case of the BDRR, the off-site response level will be implemented by means of radiological emergency plans, which are special plans whose development, implementation and effectiveness are the responsibility of the competent Public Administrations.

  The off-site response level will be structured in turn around the following radiological emergency plans:

  – Special municipal radiological emergency action plans, which will be part of the Autonomous Community Plan.
  – Special Autonomous Community radiological emergency action plans.
  – Special State radiological emergency action plan.

The scope of the Autonomous Community Plans will cover the corresponding territorial area and competences and will include the municipal action plans considered to be necessary.

The State Plan will establish mechanisms to support the Autonomous Community Plans, when requested by the corresponding management body, along with mechanisms to undertake emergency management and coordination if the situation is declared to be of national interest.

✓ **CSN Preparation for and Response to emergency situations.**

The actions taken by the CSN through its Emergency Response Organisation (ERO) during an actual situation of emergency take priority over all other CSN activities. Consequently, whenever considered necessary by the Emergency Division, all the resources of the Organisation are made available to the ERO and all other activities being performed at the time are immediately suspended.

The ERO acts independently from the regulatory and control function assigned to the CSN and shall have the following exclusive functions:

- Collaboration in taking the emergency situation to a safe condition.

- Contributing to mitigating the radiological consequences for persons, property and the environment generated by the accident underlying the emergency situation.
- Informing and advising the authorities in charge of directing the applicable emergency plan on the adoption of measures to protect the population.
- Informing the population of the risks associated with the emergency situation.
- Compliance with international commitments regarding prompt notification and mutual assistance, to the extent that this affects the CSN.

In order to meet all these functions, the CSN has developed an Emergency Action Plan, revision 4 of which was approved on April 27th 2005, which includes a special Organisation of the Council's human resources and the availability of specific resources and tools helping in the processes to be carried out by this organisation. The Emergencies Room (SALEM) is the place where the Emergency Organisation of the CSN performs its function and where the tools required to perform its functions are to be found. In addition, the CSN Emergency Organisation has stand-by personnel permanently assigned to it, in weekly shifts, responsible for responding from the SALEM in the initial moments of an emergency and for proceeding to locations affected by the emergency if so indicated by the management. Furthermore, the CSN has a contract with a RPTU through which specialist personnel may be made available at any place in the territory in a time such that it is possible to guarantee coverage of the functions commissioned to the CSN in the event of a nuclear or radiological emergency.

Annex E includes a summary description of the CSN Action Plan and of the ERO for emergency response.

25.4. Initial and on-going training: Drills and Exercises

The general aspects of initial and on-going training for those required to act in the event of an emergency, and the planning and performance of exercises and drills, are included basically in the PLABEN and in the directives through which it is developed, approved by the resolution of the Sub-Secretariat of the Ministry of the Interior on June 7th 2005, i.e., the directive on previous public information, the directive on the initial and on-going training of those required to intervene and the directive on nuclear emergency plan exercises and drills programmes.

Emergency response personnel initial and on-going training activities are subject to planning, this being specified in annual programmes for both the personnel of the nuclear facilities and the personnel of the public administrations required to intervene to address emergencies. These programmes include theoretical and practical courses, training exercises and partial and general drills aimed at verifying the degree of preparedness of the personnel, systems and support resources.

As regards the low and intermediate level radioactive waste disposal facility, a mandatory site emergency drill is performed annually. The objective of this emergency drill is to check the suitability of the facility's Site Emergency Plan through the performance of a set of activities covering the majority of the radiological emergency response actions established in the said Plan.

The CSN monitors the development of the annual emergency drills at all the nuclear facilities through the activation and actuation of the ERO at the SALEM. The activities performed during these drills are carried out under conditions of maximum realism, applying the procedures in place for the activation and actuation of the ERO operating groups. Furthermore, these drills in-

clude practice of the coordination between the CSN and the corresponding Provincial and National Authorities, the aim being to verify the general efficiency of the existing procedures.

In addition, the CSN sends inspectors to the sites for checks on the operability of the Site Emergency Plan and in situ tracking of the performance of the drills, the objective being to require the facility to implement whatever corrective actions might be established as a result of the observations made.

25.5. International arrangements, including those with neighbouring countries where necessary

The Spanish State subscribes to the IAEA Convention on the Prompt Notification of Nuclear Accidents, for which the point of contact is the CSN SALEM, and the Convention on Mutual Assistance in the event of Nuclear Accidents or Radiological Emergencies, for which the point of contact is the Operations Coordination Room (SACOP) of the DGCD&E.

Furthermore, as a Member State of the European Union, the Spanish State is required to establish in its territory, and with respect to other States and the Commission, the requirements arising from the Decision of the Council 87/600/EURATOM regarding Community arrangements for the prompt exchange of information in the event of nuclear accidents or radiological emergencies, known as the ECURIE agreements or arrangements. The CSN is the Competent National Authority for ECURIE and the SALEM the National Point of Contact for this agreement .

In addition, the Spanish and Portuguese States have signed and maintain a Bilateral Agreement on the Cross-Frontier Nuclear Safety of Nuclear Facilities, which contemplates specific notification and information exchange activities in the event of a nuclear accident or radiological emergency occurring or having effects on the respective national territories of the two States. The CSN is the Competent National Authority for the application, maintenance and development of the aforementioned Bilateral Agreement and the SALEM the National Point of Contact.

In 2009 the CSN signed a specific collaboration agreement in relation to the Planning, Preparation for and Management of Nuclear or Radiological Emergency Situations with the French Nuclear Safety Authority.

Spain participates actively in the internationally established programmes of exercises and drills: the exercises included in the European Union's ECURIE system, the OECD Nuclear Energy Agency's INEX programme of exercises, the CONVEX exercises of the IAEA and the bilateral exercises with Portugal. The CSN participates in these exercises, in certain cases activating its ERO, in coordination with the emergency Civil Defence resources and those of the Government of the Nation. In these exercises, in addition to verifying the international procedures for the notification of nuclear emergencies and information exchange, the national procedures for the coordination of institutions are also put into practice, especially those relating to monitoring of the situation, decision-making and the supply of information to the media and the population in general.

As a culmination to the Presidency of the EU, and with a view to testing the procedures for collaboration between the intervention modules of the different Member States, an exercise known as PRES UE 2010 was carried out within the framework of the European Union Mechanism for Cooperation in Civil Defence (MIC). This exercise simulated an accident in the Spanish territory during the landing of an aircraft, including both a fire and people wounded to different degrees of seriousness and an environment contaminated by ionising radiations. The exercise is included within the framework of the European Quick Response Coordination Project EU RRC 7, with the participation of the national organisations involved in this type of emergencies, among them the CSN, and organisations from different EU countries.

In 2010 Spain undertook the INEX-4 exercise, promoted by the Nuclear Energy Agency of the OECD. The scenario was the detonation of a "dirty bomb" in a busy area of Madrid, with a major impact on the population, property and the environment. The exercise focussed on the phase of recovery, i.e. it started 15 days after the emergency was declared, the aim being to identify, apply or improve the procedures applicable to this phase of the radiological emergency. The exercise was planned and performed adhering to what is established in the BDRR, approved a few days before the exercise.

In Spain, INEX-4 included not only the obligatory office part of the exercise, the objective of which was to verify the analysis and decision-making capacities of the organisations involved, known as the "desktop exercise", carried out on 23/11/2010, but also a voluntary "field exercise", carried out on 2/12/2010, to check the operative coordination between the organisations involved in radiological emergencies, with the participation of radiological, medical, search and rescue, security personnel, etc., this being performed at the National College of Civil Defence.

Enresa participated very significantly in both PRES UE 2010 and INEX-4, for the management as radioactive waste of both the hypothetical sources involved and the radioactive wastes that would be generated in emergencies of this type.

Article 26
Decommissioning

Art. 26. Decommissioning

Each Contracting Party shall adopt measures adequate to guarantee safety during the decommissioning of a nuclear facility. These measures shall guarantee the following:

i) The availability of qualified personnel and adequate financial resources;

ii) Application of the provisions of article 24 with respect to operational radiological protection, releases and non-planned and uncontrolled emissions;

iii) Application of the provisions of article 25 with respect to emergency preparedness; and

iv) Maintenance of records of information of importance for decommissioning.

According to the Spanish legislation, 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 allow for 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 his responsibility as operator and, in the case of restricted release of the site, defines the applicable limitations on use and the party responsible for their maintenance and surveillance of their compliance[1].

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

[1] *Regulation on Nuclear and Radioactive Facilities, approved by Royal Decree 1836/1999, of December 3rd, and as modified by Royal Decree 35/2008, of January 18th.*

26.1. Organisation and responsibilities for dismantling

The organisation and responsibilities for the dismantling of nuclear and radioactive facilities are legally defined by Royal Decree 1836/1999, of December 3rd, approving the Regulation on Nuclear and Radioactive Facilities, modified by Royal Decree 35/2008, and by Royal Decree 1349/2003, of October 31st, on the ordering of ENRESA's activities and their financing, modified by Law 11/2009.

Specifically, the modification imposed by Law 11/2009 implies a revision of the system of responsibilities by establishing as follows:

> *"...the dismantling and decommissioning of nuclear facilities constitute an essential public service for which the State shall be responsible, pursuant to article 128.2 of the Spanish Constitution.*
>
> *The Empresa Nacional de Residuos Radiactivos, S. A. (ENRESA) is commissioned to manage this public service in accordance with the General Radioactive Waste Plan approved by the Government.*
>
> *In this respect, ENRESA is set up as a resource and technical service of the Administration, carrying out the functions assigned to it by the Government..."*

As indicated in the third National Report, according to article 4, section e) of Royal Decree 1349/2003, the responsibility for operations deriving from the decommissioning of nuclear and radioactive facilities corresponds to ENRESA. For its part, the Regulation on Nuclear and Radioactive Facilities indicates that when the operating permit for a nuclear facility expires, the responsibility for decommissioning lies initially with the licensee of the facility who, prior to granting of the corresponding authorisation is in charge of the so-called pre-dismantling activities. For granting of the dismantling authorisation, the licensee of the operating permit must previously have conditioned the operating radioactive wastes generated during the operation of the facility (art. 28), in accordance with the acceptance criteria of the storage installation to which they are to be transferred. Secondly, the licensee of the facility must have unloaded the fuel from the reactor and the irradiated fuel storage pools or, otherwise, have a spent fuel management plan approved by the MITYC, following a report by the CSN (art. 28).

As was indicated in the Third National Report, the obligations are also specified and set out in detail in a contract between ENRESA and the nuclear power plant owners, approved by the MITYC.

26.2. Financing of dismantling

As has already been pointed out in Section F of this report, article 22 (Human and Financial Resources), the modification of the Nuclear Energy Act, by including an article 38 b) on "Radioactive waste management", redefines the system of financing of the activities carried out by ENRESA within the framework of the corresponding GRWP, the scope of responsibility also including the dismantling and decommissioning of nuclear facilities.

Generally speaking, the financing of nuclear power plant dismantling and decommissioning is defined and regulated by the Electricity Industry Act, Law 54/1997. The sixth additional provision of this Act, modified by Law 11/2009, of October 27th, establishes two different financing routes, as described in Art. 22.2., depending on the operational status of the facility in question as of January 1st 2010. As regards the Juzbado Fuel Assembly Manufacturing Facility, a specific

fee is established covering the overall cost of radioactive waste management and dismantling and decommissioning services.

26.3. Radiological protection and emergencies during dismantling

As described in the previous national report, nuclear facilities in the dismantling phase continue to be considered nuclear facilities until such time as their declaration of decommissioning is granted. Consequently, the requirements of the section referring to compliance with articles 24 «Operational radiological protection» and 25 «Emergency preparedness» of this convention continue to be fully applicable during the dismantling phase of nuclear facilities.

26.4. Documentary archive for dismantling and decommissioning

The obligation of the licensees of nuclear facilities to adequately compile and conserve information of relevance for decommissioning during the operational phase is contained in the RNRF. This Regulation requires all authorised nuclear facilities to possess a document specifically setting out the forecasts for its dismantling and decommissioning (art. 20 j RNRF), the aforementioned revision adding that, among other things, this will describe the forecasts relating to the definitive management of the radioactive wastes generated and corresponding cost study and the economic and financial forecasts to guarantee decommissioning, requiring also that this be part of the official operating documentation.

In addition, on February 5th 2003 the CSN issued Instruction IS-04, regulating the transfer, filing and custody of documents corresponding to the radiological protection of the workers, the public and the environment prior to the transfer of ownership of nuclear power plants for dismantling and decommissioning.

The agreements on transfer to ENRESA of the ownership of facilities to be decommissioned establish contractually the mechanisms and procedures allowing it to access all the operating archives of the facility. As a result, ENRESA may use whatever available information it considers to be relevant for the design and performance of the dismantling and decommissioning plan for the facility.

Aspects regarding the custody of documents following the decommissioning of the facility are included in Section H, article 17 (Institutional measures following decommissioning).

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Section G

Safety in the Management of Spent Nuclear Fuel

Section G. Safety in the Management of Spent Nuclear Fuel

Article 4
General safety requirements

Article 4: General safety requirements

Each Contracting Party shall adopt appropriate measures to ensure that in all stages of spent fuel management persons, society and the environment are adequately protected against radiological risks.

With this objective in mind, each Contracting Party shall adopt appropriate measures to:

i) Ensure that due attention is given to criticality and the removal of the residual heat produced during the management of spent fuel.

ii) Ensure that the generation of radioactive wastes due to spent fuel management is kept at the lowest possible level, in keeping with the type of spent fuel cycle policy.

iii) Take into account the interdependencies between the different stages of spent fuel management.

iv) Provide efficient protection for persons, society and the environment, applying adequate protection methods at national level, approved by the regulatory body, within the framework of its national legislation with due consideration given to internationally approved criteria and standards.

v) Take into account the biological, chemical and other risks that might be associated with the management of spent fuel.

vi) Strive to avoid actions whose reasonably foreseeable repercussions on future generations be greater than those permitted for the present generation.

vii) Attempt to prevent undue burdens from being imposed on future generations.

The spent fuel generated at the Spanish nuclear power plants is stored temporarily in the pools associated with the operating reactors and in the individualised temporary dry storage (ITS) facilities on the sites of the Trillo and José Cabrera plants (the latter in the dismantling phase). Both dry storage facilities use casks based on US technology, which are different in the two cases: dual-purpose metallic casks approved for storage and transport in the case of the Trillo nuclear power plant and concrete and metal casks in the case of José Cabrera, accompanied by a transport cask. An ITS facility similar to the one at José Cabrera nuclear power plant is planned for the future at Ascó NPP, along with a Centralised Temporary Storage (CTS) facility for dry storage in vaults cooled by air through natural convection.

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 installations, set out in Section E of this report, which consists basically of the Nuclear Energy Act, the Regulation on Nuclear and Radioactive Facilities, the Regulation on the Protection of Health against Ionising Radiations and the environmental legislation, as well as of the following binding Instructions (IS) recently issued by the Nuclear Safety Council:

- ✓ Instruction IS-20 on safety requirements relating to spent fuel storage casks, published on February 18th 2009.
- ✓ Instruction IS-26 on basic nuclear safety requirements applicable to nuclear facilities, published on June 8th 2010.
- ✓ Instruction IS-29 on safety criteria at temporary storage facilities for spent fuel and high level waste, published on November 2nd 2010.

These instructions incorporate the requirements of the International Atomic Energy Agency (IAEA) and the WENRA reference levels, and in the case of IS-26 the safety requirements of the European Council Directive on the safety of nuclear facilities (2009/71/EURATOM)

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

The maintenance of subcritical conditions and of adequate heat removal at temporary spent fuel storage facilities and systems are safety requirements that are incorporated through the application of technical and administrative or control systems, subject to analysis, assessment and surveillance.

The measures adopted by the licensees to comply with these requirements are described in the Safety Studies (SS), an official document submitted along with the requests for authorisations during the different phases of the facility, and in the Operating Technical Specifications (OTS), this also being a mandatory document for the operation of nuclear facilities.

These measures take into account the criteria established in the technical standards of the International Atomic Energy Agency (IAEA), as well as the standards in force in the country of origin of the technology (Appendix B of US 10CFR 50 in the case of pools and US 10 CFR 72 in the case of dry storage systems and facilities). These criteria and requirements have been incorporated in the national standards through the aforementioned Council instructions, in particular IS-20 and IS-29.

4.1.1 Measures to guarantee the maintenance of subcritical conditions

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 and 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}) be lower than 0.95 under normal operating and accident conditions and in the face of uncertainties and the most reactive situation.

The methods used to maintain conditions of subcriticality are as follows:

In the pools associated with nuclear reactors, by

- ✓ Maintenance of a safe geometric configuration,
- ✓ Use of neutron poisons (dissolved in the water or integrated in the structures of the storage racks),
- ✓ Limitation of initial enrichment and credit given to the degree of burnup. The application of these methods varies from one facility to the next, as specified below.

In relation to the above, at PWR plants, credit for the degree of burnup was incorporated with the re-racking operation carried out to increase the capacity of the pools, these being divided into two regions, one known as region II for the storage of fuel exceeding a given degree of burnup, depending on initial enrichment, and another known as 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.

As regards the dry storage casks used at the ITS facilities existing at the sites of the Trillo and José Cabrera nuclear power plants, the methods used to maintain subcritical conditions are based on the following:

- ✓ The inherent geometry of the rack housing the fuel;
- ✓ The incorporation of neutron absorbent panels attached permanently to the rack;
- ✓ The administrative limits regarding the maximum enrichment of U-235 and the minimum concentration of boron dissolved in the water used to load and unload the fuel in the casks or capsules.

In the case of the planned CTS facility, the measures to prevent criticality in the generic design assessed are based on the following:

- ✓ The maintenance of a favourable geometry of the storage capsules, and
- ✓ Limitation of the number of fuel assemblies per capsule,
- ✓ The consideration of safety margins for the parameters determining criticality in keeping with the uncertainties in the analysis methods and data, and
- ✓ The implementation of means for criticality monitoring and alarms in areas in which the fuel is handled or stored temporarily before being transferred to the storage tube.

4.1.2 Measures to guarantee adequate heat removal

In the temporary fuel storage pools, the cooling systems fulfil the safety functions of removing the decay heat generated without exceeding the temperature limits established and of maintaining a minimum level of water above the fuel assemblies in any situation, thus guaranteeing adequate shielding.

The re-racking undertaken in all the plant pools, most recently in the East pool at Cofrentes NPP, which was completed in 2009, has implied analysis and calculation of the residual heat and the re-evaluation of the cooling systems, the necessary measures being adopted where appropriate.

As regards the storage casks for the ITS facilities at the Trillo, Ascó and José Cabrera plants, these have been designed to release the heat generated by the fuel assemblies to the environment by means of passive convection, conduction and radiation mechanisms.

- ✓ In the case of the Trillo casks, heat removal is facilitated by the aluminium disks of the rack and the bimetal stainless steel and copper fins arranged radially around the neutron shielding wrapper.
- ✓ In the case of the fuel storage casks for the José Cabrera and Ascó plants, they are provided with a metal and concrete structure ventilated by natural convection that allows for the cooling of the capsule located in their interior.

In the case of the centralised temporary storage facility, ventilation is planned to be accomplished by a system of cooling by natural air convection, designed such that the structures fulfilling a safety function 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. The air will circulate inside the double sleeve surrounding the storage tubes and the hot air will then be channelled 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 guarantee separation between the lower inlet plenum and the internal volume of the vault.

4.2. Measures to ensure that the generation of radioactive wastes due to spent fuel management is kept as low as possible

The minimisation of waste generation is one of the principles incorporated in the legislation governing nuclear energy (Article 38 of the Nuclear Energy Act, as modified on November 7th in Law 33/2007). As regards spent fuel, waste minimisation is aimed at reducing to the extent possible the secondary wastes produced in purifying the water in the nuclear power plant pools and the filters of the air cleaning and ventilation systems of the buildings in which they are located. The procedures used for this purpose are supervised by the CSN.

4.3. Measures to take into account the interdependence between the different stages of spent fuel management

The legal and regulatory framework existing in Spain establishes the technical and administrative bases for the development of interfaces between the different responsible parties involved in management, such that consideration be given to the requirement that there be an interdependence guaranteeing the transfer of spent fuel from one management stage to another under optimum safety conditions and with the necessary information.

The technical measures for the application of this requirement of interdependence between stages of management are implemented basically through the application of the Radioactive Waste and Spent Fuel Management Plan, an official document for the operation of nuclear facilities that is submitted to the CSN prior to being approved by the Ministry of Industry, Tourism and Trade.

In 2008, the CSN issued Safety Guide 9.03, which establishes the objectives, criteria and contents of the spent fuel and waste plans. The measures contemplated in the aforementioned guideline, which are being progressively implemented in the fuel and waste management plans, are oriented towards the following:

i) Provide a clear vision of the situation of the detailed inventory of fuel assemblies and activated materials in storage, as well as of their degree of characterisation.

ii) Define the objectives and scope of the irradiated fuel behaviour inspection and surveillance programmes.

iii) Define the additional characterisation measures of the spent fuels and different types of high level wastes necessary to meet the requirements of subsequent stages of management.

iv) Compile and analyse the in-house experience of storage, identifying the safety aspects that need to be revised.

v) Monitor developments in the country of origin of the technology, identifying applicable R&D activities and determining the need to address in-house R&D activities or to participate in international projects.

During 2009 and 2010 all the nuclear power plant fuel and waste management plans have been revised by the licensees for adaptation to the aforementioned Guide 9.03. These plans have been evaluated by the CSN and as of the date of drawing up of this report many had been approved, with others in the phase of approval.

Furthermore, the licensees responsible for management of the fuel, the Electricity Industry and ENRESA, with the collaboration of ENUSA (the company responsible for fuel manufacturing) have carried out two Integrated Cooperation Projects at two nuclear power plants, one PWR and the other BWR, with a view to better implementing the aforementioned CSN Guide. The results of these projects are being analysed to determine the feasibility of their being implemented within the improvement programmes.

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

The legal framework existing in Spain and applicable to nuclear and radioactive facilities contains a series of provisions for the protection of persons and the environment against the risks deriving from such installations, as has been shown in Sections E and F of this report.

These provisions apply to spent fuel management facilities, both those associated with the nuclear power plants and independent installations, since the latter would be treated as nuclear facilities with a limited operating period.

The general measures adopted in relation to protection of the workers, and those relating to the control and monitoring of effluents and the optimisation of radiological protection at nuclear power plants were dealt with in previous reports.

As regards radiological protection measures in the case of storage facilities:

- ✓ Article 38 of the Nuclear Energy Act indicates that the organisations responsible for the facilities: *"shall adopt appropriate measures in all the stages of spent nuclear fuel and radioactive waste management, in order to adequately protect persons, property and the environment, both at present and in the future, against radiological risks, such that the production of wastes be as low as possible in both quantity and activity, in keeping with the scientific practice existing at each moment in time."*
- ✓ Aforementioned Council instruction IS-29 expressly indicates that the design of the facility and its operation under normal conditions should provide an acceptable level of protection, ensuring that doses are maintained below the limits established in the Regulation on the Protection of Health against Ionising Radiations

and, where appropriate, below whatever fraction of those limits might be established (dose restriction).

- ✓ Thus, in particular, a favourable decision by the CSN regarding the generic design of the centralised temporary storage (CTS) facility requires that the detailed design of the facility take into account the radiological criterion of operational dose restriction establishing a fraction of one tenth of the limit established in the Regulation on Radiological Protection against ionising radiations and setting a value of 0.1 mSv/year as the maximum limit for the potential radiological impact on the public due to the release of liquid or gaseous effluents.

As regards environmental protection measures, these are governed by the national standard on environmental impact assessment, which incorporates the European Parliament and Council Directives 97/11/CE, 857337/ CEE and 96/617CE, the text of which has been reworded in Royal Legislative Decree 1/2008, mentioned in Section F of this report. According to this standard, spent fuel temporary storage facilities designed for more than 10 years at a location different from the site of production shall be subject to the declaration of environmental impact.

In keeping with the above, the dry storage facilities existing on the sites of the Trillo and José Cabrera plants and the one foreseen at the Ascó plant, which is currently in the licensing phase, have been subjected to environmental impact assessment (EIA). Likewise, the licensing of the CTS facility will carry with it the corresponding EIA.

4.5. Measures for the consideration of the biological, chemical and other risks potentially associated with spent fuel management

The prevention of biological, chemical and other risks, except radiological risks, associated with the management of spent fuel is regulated by the standards common to other industrial activities entailing such risks, constituted basically by the legislation on the assessment of environmental impact, which transposes Community directives. The authorisation for spent fuel management facilities requires an environmental impact assessment taking such risks into account.

For its part, the protection of the personnel operating such facilities against non-radiological risks is regulated by Law 31/1995 on the Prevention of Occupational Risk.

It is also important to point out that events that in the opinion of the licensee might have significant public repercussions (including environmental variations and occupational accidents) are subject to the process of notification described in CSN Safety Guide No 1.6 on “Reportable events at Nuclear Power Plants”.

4.6. Measures to prevent repercussions for future generations greater than those permitted for the generations of the present

This principle of protecting future generations does not initially have a direct impact on the spent fuel management facilities currently existing in Spain since these are temporary storage installations whose design and operating lifetime, although not explicitly defined in all cases, is associated with the lifetime of the operating nuclear power plants, as is the case of the nuclear power plant pools and the dry storage facility at the Trillo plant. In the case of the José Cabrera plant, the facility is in principle linked to the completion of its dismantling, as a result of which it is limited.

As regards the centralised temporary storage facility, the generic conceptual design of which (without a specific site) has been favourably appreciated by the CSN, its design lifetime is 100 years and its operating lifetime 60 years, these periods also being limited. In any case, these are time periods that are within normal intervals, The radiological protection principles currently in force for the public and the environment and established in the Regulation on the Protection of Health against Ionising Radiations, or a fraction thereof, are applicable, as a result of which there is a guarantee that potential exposure will be kept as low as is reasonably achievable.

This fraction of the dose limit has been established at 0.1mSv/year in the limits and conditions included in the favourable report on the generic design of the CTS facility, as pointed out in section 4.4 of this report.

Nevertheless, and as pointed out in the previous section, bearing in mind that fuel and waste management activities may involve several responsible parties and cover longer periods, article 38 of the Nuclear Energy Act, in referring to the measures to be taken by the organisations responsible for nuclear facilities indicates 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 main measures taken to ensure that no undue burdens are placed on future generations are as follows:

a) Clear assignment of the responsibilities of the producer and implementer (ENRESA) and of the regulator as regards the security and radiological requirements applicable in the long term.

b) Availability of funds for the financing of the activities involved to meet the maintenance, control and surveillance requirements, such that the generation benefitting from the production of electricity or other services provided by the radioactive facilities pays the costs associated with the wastes generated, up to their final disposal. The legal framework in force assigns to ENRESA the responsibility of ensuring the long-term management of all installations serving for the storage of wastes and spent fuel and contains provisions for the setting up, application and management of the economic fund for the financing of the measures required for the maintenance and monitoring of this type of installations.

Article 5
Existing facilities

Article 5: Existing facilities

Each Contracting Party shall adopt suitable measures to examine the safety of any spent fuel management facility in existence as of the entry into force of the Convention with respect to the said Contracting Party and to ensure that, if necessary, all improvements reasonably feasible are made to increase the safety of such facility.

5.1. Changes to existing facilities

As pointed out in heading D.1 of Section D of this report, the existing temporary storage facilities for irradiated fuel are the pools at the nuclear power plants and the two individualised storage (ITS) facilities for casks on the sites of the Trillo and Jose Cabrera plants.

The following noteworthy events have taken place during the period of time covered by this report:

- ✓ The completion in 2009 of the replacement of the storage racks in the East pool at Cofrentes nuclear power plant with other more compact units made of borated steel, this having increased the storage capacity by 1,201 additional positions and delayed saturation of the pool to the year 2021. This operation has completed the re-racking of the pools at the eight operating reactors, which was mainly carried out during the previous decade, as described in previous reports.
- ✓ The loading and transfer of the 377 fuel assemblies from the pool at the José Cabrera nuclear power plant to the ITS facility, where they are stored in 12 casks. This operation, initiated in January 2009, was completed in September of that same year, prior to granting of the authorisation for the plant dismantling plan and the transfer of ownership of the facility to ENRESA, in keeping with the requirements of the regulations (Figure 5 shows a view of this storage facility). The pool currently contains only "special wastes", consisting of fuel assembly and reactor internal supplements, which are scheduled to be loaded into 4 casks for location alongside the others.
- ✓ Completion of the safety assessment of the design modification of the casks in use at the ITS facility at the Trillo plant for the storage of high burnup fuel, of up to 47 MWd/TU and 9 years of cooldown, authorised in October 2009.

  This facility, with a capacity for 80 casks of the type currently approved and in use, has been in operation since 2003 and, by the end of 2010, 20 casks housing 420 fuel assemblies were stored in it. A view of this storage facility is shown in Figure 6.

5.2. Measures adopted for the safety review of existing facilities

The safety review of the pools associated with the nuclear power plants is 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. During the period covered by this report, PSRs have been carried out at the Santa Mª de Garoña, Almaraz and Vandellós II plants, and the PSR for the Cofrentes plant is currently in the evaluation phase.

In addition, and as described in previous reports, specific evaluation and review programmes have been carried out with respect to the pools on different occasions, in particular as a result of the re-racking operations, the last of which was performed at the pool of the Cofrentes plant.

A fundamental element for the control of spent fuel management is the Radioactive Waste and Spent Fuel Management Plan (PLAGERR), a mandatory document for the operation of nuclear facilities required by the RNRF. This plan is updated and evaluated whenever there are relevant changes to the plant storage systems and in all cases every 10 years, along with the renewal of the plant operating permit.

During this period the PLAGERRs of all the plants have been reviewed by the licensees to bring them into line with CSN Safety Guide GS-9.03 on the contents and criteria for the drawing up of

Figure 5. View of the José Cabrera Nuclear Power Plant ITS facility.

Figure 6. View of the Trillo Nuclear Power Plant ITS facility.

such plans; in certain cases they have been evaluated and approved and in others they are expected to be approved in the near future.

This period has seen completion of the Coordinated Research Projects (CRPs) on supporting studies for the implementation of the aforementioned CSN Guide 9.03, carried out by the electricity industry (UNESA) and ENRESA with the collaboration of ENUSA (public company in charge of the manufacturing of nuclear fuel), the results of which are being analysed to deter-

mine the feasibility of implementing the Guide within the framework of the improvement programmes.

Likewise, during this period, the CSN has continued to perform inspections as part of the Basic Inspection Plan (BIP) of the existing storage facilities, this forming 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".

In addition, during 2009 the CSN performed the necessary inspections of the re-racking operation in the pool at Cofrentes and all the operations for loading of the spent fuel into the dry storage casks and transfer to the ITS facility at the José Cabrera plant.

Article 6
Siting of projected facilities

Article 6: Siting of projected facilities

1. *Each Contracting Party shall adopt suitable measures to ensure the establishment and application of procedures at projected spent fuel management facilities, with the following objectives:*
   - i. *Evaluation of all pertinent factors relating to the site that might affect the safety of the facility throughout its operating lifetime;*
   - ii. *Evaluation of the probable consequences of the facility for the safety of persons, society and the environment;*
   - iii. *Provision to the public of information on the safety of the facility;*
   - iv. *Consultations with the Contracting Parties located in the vicinity of the facility, to the extent to which they may be affected by it, and provision on request of general data relating to the facility allowing them to assess the probable consequences of the facility for safety in their territories.*
2. *For this purpose, each Contracting Party shall adopt appropriate measures to ensure that these facilities do not have any unacceptable effects on other Contracting Parties, siting them 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 contemplates the temporary storage of spent fuel and high level waste based on a dry system guaranteeing the safety and protection of persons and the environment over the periods of time required to undertake definitive or very long-term management.

The facilities planned for spent fuel management shall be used for the temporary storage of such fuel, this being accomplished in a centralised or individualised manner. In general, the siting aspects to be considered will depend on whether a new site or an existing nuclear power plant site is used and, in this latter case, on whether the facility is constructed during the operation of the plant, as is the case of the Individual Temporary Storage (ITS) facility at the Trillo and Ascó plants, or following definitive plant shutdown, as is the case of the ITS facility at the José Cabrera plant.

6.1. Forecasts regarding new spent fuel management facilities

The solution proposed for the management of spent fuel, HLW and other radioactive wastes that, in view of the technical, strategic and economic analyses performed, cannot be disposed of at the solid radioactive waste disposal facility in Sierra Albarrana (El Cabril) is based on the availability of a vault type Centralised Temporary Storage (CTS) facility, the operating period of which would be some 60 years.

The Centralised Temporary Storage facility proposed would be of the vault type and would be modular in nature, equipped with a hot cell for the reception and conditioning of the spent fuel and other wastes, this allowing it to serve the dual purpose of a storage facility and a technology and research centre in the field of radioactive waste management (see Figure 7).

The Congressional Commission for Industry, formed by representatives of all the parliamentary groups, unanimously agreed in December 2004 to urge the Government to adopt a strategy based on a CTS facility. Likewise, in its session held on April 27th 2006, this Commission for Industry approved a motion relating to the setting up of an Interministerial Commission in charge of establishing the criteria to be met by the CTS facility for nuclear fuel and high level radioactive wastes and associated technology centre.

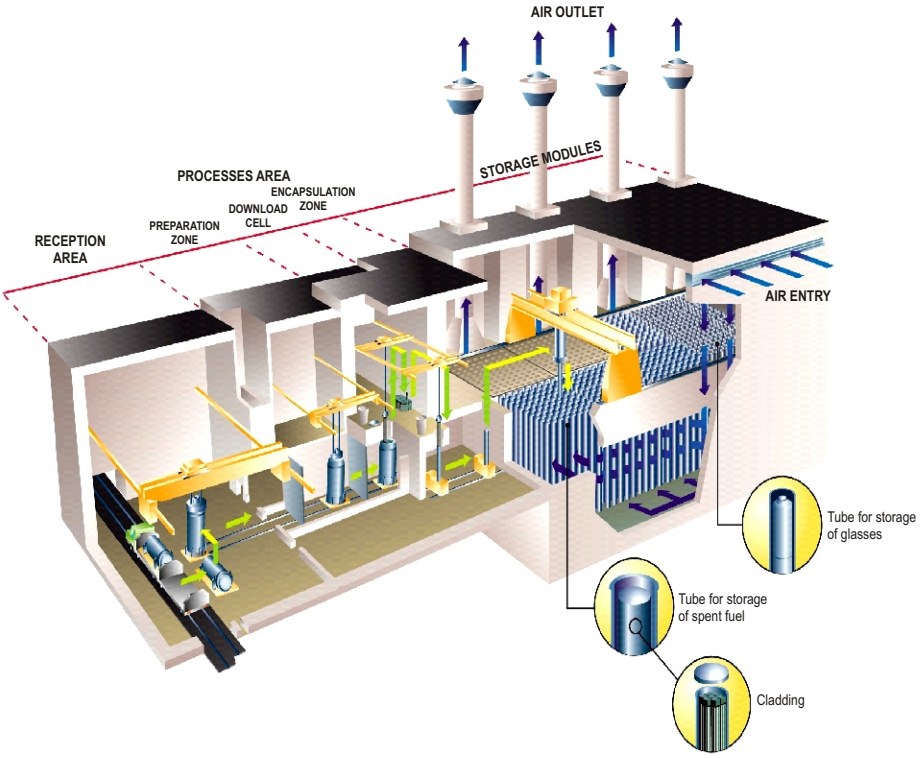

Figure 7. Design of the centralised temporary storage facility.

In response to the aforementioned Motion, the Interministerial Commission was set up by Royal Decree 775/2006, of June 23rd, made up of representatives of the current Ministries of Industry, Tourism and Trade, of the Environment and Rural and Marine Affairs, of Economy and the Exchequer, of Science and Innovation, of Public Health, Social Affairs Policy and Equality, of Territorial Policy and Public Administration and of the Office of the President of the Government.

The Interministerial Commission has been responsible for the following functions:

a) Establishing the technical, environmental and socio-economic conditions to be fulfilled by potential candidate sites for the CTS facility.

b) Establishing and driving the processes of public information and participation.

c) Developing the procedure by which interested municipal areas may opt to be candidates for the site.

d) Drawing up, for submittal to the Government, of a list of proposed candidate sites selected from among the interested municipal areas, on the basis of technical assessments of their suitability and taking into account the proposals made by the affected autonomous communities, where appropriate.

Since its creation, this Commission has undertaken the following tasks:

- ✓ Drawing up of reports on different aspects relating to: site criteria, the need for the CTS facility, international references endorsing the project, the safety and radiological protection of the installations, initiatives associated with the project (technology centre) and the transport of spent fuel (risks, experience and international studies). These reports have been published on the site website.
- ✓ Establishment of processes for public information and participation through the creation of a freely accessible official website at the Ministry of Industry, Tourism and Trade, with the presentation of the reports drawn up and the minutes of the meetings of the Interministerial Commission. In particular, as from July 27th 2006, a period of information on the public call for bids that was later to take place was opened, through a press announcement published in all the media, and the questions posed as a result of this publication were answered.
- ✓ Development of the Procedure and Basis of the public call for bids for the selection of candidate municipalities to house the CTS facility and its associated technology centre, by means of the Resolution of December 23rd 2009 of the Secretariat of State for Energy (Official State Gazette of December 29th 2009). The following steps contemplated in the procedure have been carried out throughout 2010:

  a) Presentation of candidatures: Candidatures were received by the Secretariat of State for Energy of the MITYC from 13 municipalities located in 5 Autonomous Communities within the established term (one month as from the day following publication of the Resolution in the Official State Gazette).

  b) Agreement of the Interministerial Commission approving the provisional list of candidatures accepted and excluded, during the meeting of the said Commission on February 5th 2010. Of the 13 candidatures presented, 5 were initially excluded. Among the reasons for the exclusion of these candidatures were their submittal outside the term established and the lack of the documentation required or of the certificate of agreement by the municipal council, which was an essential requirement for the presentation of applications. This list was published on the site website and the applicants were notified individually. In addition to the 13 candidatures presented, there was an additional application which was withdrawn by the municipality on agreement by its council.

c) Claims: A period of 10 days was granted as from the date of individual notification to the municipalities in order for those municipalities that had been provisionally excluded to be able to submit claims regarding their rejection and/or make good whatever defects had been found. The Interministerial Commission finally accepted one of the candidatures that had been provisionally rejected, of the two that submitted allegations, since the error detected had been corrected. In addition, three of the municipalities rejected in the previous step desisted in their candidature.

d) Definitive list of candidatures accepted and rejected: The claims presented having been analysed, the Interministerial Commission approved the definitive list of candidatures during its meeting held on February 22nd 2010. The 9 municipalities included on this list were notified individually and the decision was published on the aforementioned website. The municipalities that were finally chosen as candidates were Albalá (Cáceres), Ascó (Tarragona), Congosto de Valdavia (Palencia), Melgar de Arriba and Santervás de Campos (Valladolid), Torrubia de Soria (Soria), Villar de Cañas (Cuenca), Yebra (Guadalajara) and Zarra (Valencia).

e) Analysis of the municipal area: Following approval of the definitive list, the Interministerial Commission analysed the territories of the accepted candidate municipalities in relation to the exclusion criteria set out in the bases for the public call. In keeping with these criteria those areas that formed part of the European Nature Conservation Network, Natura 2000, including National Parks, Nature Reserves and other equivalent areas managed by the Autonomous Communities were excluded, as were Sites of Community Importance (SCIs) and Special Protection Areas (SPAs) for birds, protected areas belonging to the Ministry of Defence, Common Woodland Areas and land forming part of the Spanish Network of Cattle Routes, areas containing items of interest belonging to the national heritage and potentially affected due to their being in the area of influence of the facility or by the corresponding construction works and sites requiring transport to necessarily be performed by air or sea. The reports resulting from this analysis, containing the unsuitable areas in each municipal territory, were provided individually to the candidate municipalities.

f) Proceedings for allegations and public information and participation: These proceedings, lasting 20 days and relating exclusively to application of the criteria of the public call to the candidatures of the accepted municipalities, were agreed to by the Interministerial Commission during its meeting of March 4th 2010, as contemplated in the procedure, and initiated following the publication of an announcement in the Official State Gazette on March 6th 2010. Furthermore, 44 institutions and entities were notified individually, among them the Autonomous Communities and Provincial Offices of the Government in whose territories are located the municipalities selected, the municipalities themselves, the Spanish Federation of Municipalities and Provinces and those organisations and associations having purposes relating directly to the subject of the procedure. Likewise, the documentation relating to these proceedings (applications submitted and analysis of municipal areas) was published on the site website.

   A total 14,420 written allegations were received, these being examined by the Interministerial Commission during its meeting of April 14th 2010. An allegation assessment report was drawn up and published on the website. Likewise,

written replies were sent to those institutions and associations notified individually. As a result of the allegations received, certain modifications were made to the analysis reports on the municipal areas and the exclusion of the municipality of Torrubia de Soria was confirmed, due to its entire municipal territory being occupied by a ZEPA and a LIC. This municipality confirmed its withdrawal from the proceedings, the number of candidate municipalities remaining at 8 for the rest of the procedure.

g) Presentation of plots: On completion of the aforementioned proceedings, the Interministerial Commission informed the candidate municipalities of the zones that had been excluded from their municipal territories by way of letters sent on April 29th 2010, inviting them to provide alternatives within one month.

h) Study of candidatures: The final reports with the analyses of the municipal areas were drawn up taking into account the information received by the candidate municipalities and the factors to be considered in examining the plots (detailed in the bases of the public call).

i) Final report with proposals regarding candidate sites: In its meeting held on September 16th 2010, the Interministerial Commission approved the final report proposing candidate sites to house the CTS facility and its associated technology centre. This report describes individually the main characteristics of the plots proposed by the candidate municipalities and includes a comparative analysis of these plots, grouping them on the basis of their capacity to adapt to the criteria regarding the feasibility of the project, including the ease with which the facility might be licensed and developed. Finally, the report concludes that, from the technical point of view, the terrains proposed by all the candidate municipalities are considered to be feasible for performance of the project and that there are no major differences between them as regards most of the factors. Nevertheless, the comparative analysis points to the fact that the plots presented by 4 of the 8 municipalities are more suitable.

As of the date of closure of the report, only the last step of the procedure is still pending, this consisting of the Government's designating the definitive site by means of an agreement by the Cabinet of Ministers.

Furthermore, taking into account, on the one hand, the period required for the licensing and construction of a CTS facility and, on the other, the period foreseen for the pools of the two groups of the Ascó Nuclear Power Plant to reach saturation, the construction of an installation for the dry temporary storage of the spent fuel produced by this plant (ITS facility) is required, until such time as it is possible to transport this fuel to the CTS. The ITS facility will be made up of two seismic resistant storage slabs, on which will be placed up to 32 storage modules with a total capacity of up to 1,024 fuel assemblies, coming indistinctly from the two groups. The licensing of this ITS facility, which is expected to initiate its operation during the first six months of 2012, requires the following proceedings:

✓ Approval of the design of the storage cask or system, in accordance with the provisions of article 80 of the RNRF. The storage system selected is the same as that used for the ITS facility at José Cabrera Nuclear Power Plant. It consists of a multi-purpose metallic capsule confining the fuel, with a capacity for 32 fuel assemblies, a storage module housing this capsule during storage and a transfer container containing it during loading, unloading and transfer from the fuel pools to the storage module. The design of the storage system (see figure 8) to be used was approved by the Director General of Energy Policy and Mines on February 1st

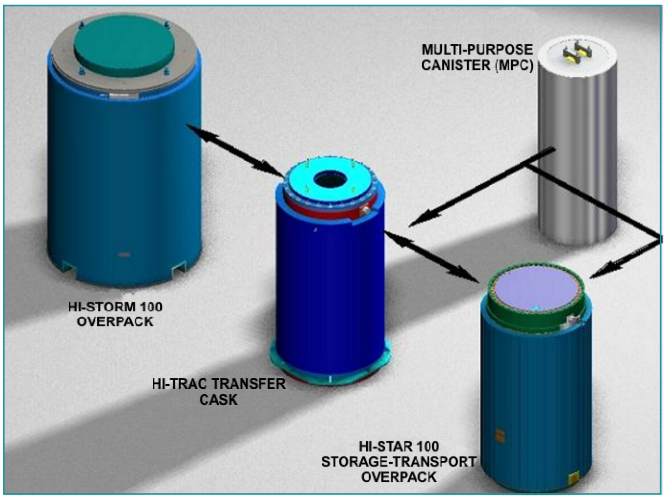

Figure 8. Storage system.

2011 for a period of 20 years, in the wake of a request by ENRESA on September 30th 2009 and a favourable report by the Nuclear Safety Council. The standard design of the storage module was slightly modified in order to adapt it to the plant fuel. Likewise, the authorisation of the transport cask is currently under way.

✓ Licensing of the temporary storage facility itself, dealt with as a plant design modification, in accordance with the procedures established in article 25 and following articles of the RNRF. As the design modification has been considered "major in scope", it requires not only a modification in the conditions of the plant permit but also an authorisation previous to the former for the performance and assembly of the modification, to be granted by the DGPEM. This authorisation, which is currently in the process of evaluation, was requested by the licensee on February 15th 2010.

✓ Environmental Impact Assessment (EIA) of the facility, with a view to fulfilling the requirements of Royal Legislative Decree 1/2008, of January 11th, approving the reworded text of the Law on project Environmental Impact Assessment. In keeping with this standard, various organisations of the Administration are involved in the process: on the one hand the substantive body in charge of authorising the project, which will be the Directorate General for Energy Policy and Mines of the MITYC, and on the other the environmental organisation in charge of the environmental assessment itself, which will be the Directorate General for Environmental Assessment and Quality (DGCyEA) of the Ministry of the Environment and Rural and Marine Affairs.

In compliance with the provisions of the standard, in 2009 the licensee of the plant requested that the project be submitted to an EIA, the request being accompanied by the initial project document; the licensee also requested the scope, which was provided by the DGCyEA in August 2010, following supply by the licensee of the complementary information requested. In accordance with the aforementioned scope, the definitive study was submitted to the DGPEM on October 8th 2010, with

a view to its being subjected to the process of public information and consultations with the public Administrations and stakeholders. This was accomplished through publication of the corresponding announcement in the Official State Gazette on December 15th 2010, a period of 30 days being granted for the presentation of allegations. The process will conclude with the issuing of the environmental impact statement by the DGCyEA and its subsequent publication.

6.2. Measures for the assessment of all safety-significant factors relating to the site

The measures for the assessment of siting factors affecting storage facilities at nuclear installations are set out in the Safety Analysis to be submitted with the corresponding authorisations throughout the licensing process, as established in the RNRF (presented in Annex B of the report).

Specifically, the study for characterisation of the site and of the area of influence of the facility is submitted and evaluated along with the request for authorisation of the site, this study including sufficient data on those parameters of the site that might affect nuclear safety or radiological protection, including demographic and ecological data, and activities relating to town and country planning.

These data on the site factors are subsequently completed in the documentation to be submitted with the request for the construction and operating permits, which also includes the monitoring and verification plans relating to the basic parameters representative of the site.

The site factors are also evaluated in the Periodic Safety Reviews to which the nuclear facilities are subjected every 10 years and in the requests for plant modifications when these modifications affect factors relating to use of the land or to the conditions initially foreseen at the site. Finally, a radiological study of the site and of its area of influence is required to be submitted along with the application for decommissioning.

The facilities currently planned are an individualised temporary storage (ITS) facility on the site of Ascó nuclear power plant and the centralised temporary storage (CTS) facility foreseen in the General Radioactive Waste Plan approved by the Government in 2006 and currently in force.

The following processes are carried out in the case of the ITS facilities, both those existing at the Trillo and Jose Cabrera plants and the one currently in the licensing phase to house the fuel at the Ascó plant, the sites of which have been evaluated previously through the different authorisation and plant safety reviews:

- ✓ Checking that the site 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 on cask design and usage requirements, and
- ✓ Analysis of site factors for the design and laying of the ITS facility foundation slab.

In the case of the CTS facility contemplated, licensing will follow the process established for nuclear facilities, the site request being accompanied by documentation on the detailed characterisation of the site. In addition, it must fulfil the requirements regarding the limits and conditions of the site contained in the favourable report on the generic design issued by the CSN on June 28th 2006, on the basis of the provisions of article 82 of the RNRF. These limits and conditions are dealt with in the following section.

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

The objective of the assessment of the site of a nuclear facility is to determine the effects that the latter might have on the surrounding population and environment, as well as the possible conditioning factors that the site might impose on the design of the facility.

The general criteria for assessment of the site and of the possible radiological repercussions, incorporated in CSN safety standards IS-26 and IS 29, indicate the need for the following:

- ✓ Consideration of the different interactions between the facility and the environment, including factors such as population density, meteorology, surface and groundwater hydrology, geology, seismology, land and water usage and other ecological and environmental factors, along with those attributable to human activity.
- ✓ Determination of the risks associated with external events, natural or due to human action, that must be considered in the design of the facility, taking into account their frequency and severity and their evolution over the planned lifetime of the facility, from construction to decommissioning.
- ✓ Consideration of the combination of natural events and environmental conditions that might contribute to aggravating the derived risks.

By way of a guideline, the standards indicate the following natural and human-induced events to be considered, although these will in fact depend on each site:

- ✓ External events: extreme environmental conditions (precipitation, rainfall, snow, hail, wind, lightning strikes, high or low temperatures, humidity, etc.), flooding due to the failure of a dam or to a river bursting its banks, earthquakes, the subsidence of structures, hurricanes and tornados, natural fires, the effects of the flora and fauna (blocking of air inlets or outlets, damage to civil works structures, etc.).
- ✓ Phenomena induced by mankind: fire, explosions, the release of hazardous or corrosive substances (from industrial or military facilities or from transport infrastructures), aircraft impacts, the impact of missiles due to the structural or mechanical failure of installations located in the vicinity, loss of off-site power and of electrical force, civil uprising (failure of infrastructures, strikes, blocking supplies).

In order to consider an event as being design basis, a threshold of annual frequency is normally used that takes into account the period of operation of the facility, a threshold of 1 million years normally being acceptable to decide on the need to perform a detailed analysis of the effects of events of this type and the possible measures to mitigate them. In any case, the cut-off threshold value for an event to be considered as being design basis should be established in the design basis.

In the case of the individualised temporary storage (ITS) facilities existing at the sites of the Trillo and José Cabrera nuclear power plants, and the one planned for Ascó, the assessment takes into account the characteristics of the site, known from plant licensing and review, and the interface with the storage system or casks, in accordance with the following specific criteria:

- ✓ Seismic and geotechnical aspects, using as a basis the spectrum included in regulatory guide 1.60 (“Design Response Spectra Seismic Design of Nuclear Power Plants”), such that the foundation slab of the storage facility be capable of withstanding the action of an earthquake with a peak acceleration of 0.25 g, and compatibility with the criteria applicable to the casks and included in 10 CFR 72 (“Geological and Seismological Characteristics for Application for Dry Casks Modes of Storage”).

- ✓ Events representative of the altered and abnormal conditions that might occur throughout the lifetime of the facility, and the radiological consequences of very low probability events, a study of aircraft strike having been required in the case of the ITS facility at José Cabrera.
- ✓ Aspects of radiological protection, including measurement of the dose limits at the limits of the controlled zone, surveillance zone and controlled area, the scope of the environmental radiological surveillance programme being extended when considered necessary.

As regards the future licensing of the centralised temporary storage (CTS) facility, the generic design of which was reported on favourably by the CSN in 2006 (without a specific site), the limits and conditions established by the CSN in that report are to be taken into account, in addition to the general criteria. These require the study of the site to determine the following:

a) External natural phenomena and those induced by mankind for their inclusion in the detailed design basis, taking into account the classification given in standard ANSI/ANS 57.9-1992 "Design criteria for an independent spent fuel storage installation (dry type)". The detailed design will consider an annual average cut-off frequency of one event every million years (10^{-6}/year) as the threshold for design basis events. The detailed design of the CTS facility should determine the severance probability associated with each event, such as aircraft impact accidents, off-site flooding, tornados and hurricanes and risks of human origin in the vicinity of the facility, for them to be considered as accidents belonging to the "beyond design basis" category.

b) Current and future local uses of land and water and the population (most exposed individual and general public) that might be affected by the installation; and

c) The processes of mobilisation and transport of contaminants to the critical individual and the public, including the dispersion and dilution parameters necessary to determine the radiological impact of the facility under both normal operating and accident conditions".

6.4. Public information on the process of site selection and construction of facilities

In relation to the process of selecting the site to house the CTS facility and its associated technology centre, Royal Decree[1] 775/2006 of June 23rd set up an Interministerial Commission to establish the criteria to be fulfilled by the site, in keeping with the strategy contemplated in the 6th GRWP. As pointed out in section 6.1, the constitution of this Interministerial Commission was requested by means of a Motion issued by the Congressional Commission for Industry. The functions of this Interministerial Commission, which has been supported by a Technical Advisory Committee especially set up for this purpose, include the definition of the basic criteria to be fulfilled by a site in order for it to be able to host the CTS facility and associated technology centre, provision of the necessary information for all those municipalities and entities that might be interested in learning more about the project and the organisation of a public call for the selection of candidate municipalities to host the site. This call for bids, which was implemented by the Resolution of the Secretariat of State for Energy of the issued on December 23rd 2009, has been carried out throughout 2010 and has been open to interested municipalities applying volun-

[1] *Royal Decree 775/2006, of June 23rd, creating the Interministerial Commission for the establishment of criteria to be fulfilled by the site for the centralised temporary storage facility for spent nuclear fuel and high level wastes and its associated technology centre, Official State Gazette number 159 of July 5th 2006.*

tarily following agreement by the Municipal Council. Article 6.1 describes the procedure adopted in greater detail.

From 2006 to the present, all the arrangements involved in the site selection process have been carried out with high levels of transparency, with information provided individually to the stakeholders and generally to the public through the creation of a website managed by the MITYC and dedicated exclusively to promoting public information and participation in the site selection process, and with replies provided to questions posed by electronic media. The aforementioned website has informed the public of the basic characteristics of the CTS project, its background, the meetings of the Interministerial Commission and the reports drawn up, the steps involved in the site selection procedure and the documentation relating to the candidate municipalities.

Particularly interesting among the arrangements included in the procedure is that contemplated in the call for bids and relating to allegations and public information and participation. This was initiated on March 6th 2010 through the publication by the MITYC of an announcement in the Official State Gazette that established that anybody wishing to do so might submit observations and allegations regarding the application to the accepted candidate municipalities of the criteria included in the call for bids, a period of 20 days being provided for this. These allegations might be sent either via an electronic mail address set up for this purpose or be addressed to the Secretary of State for Energy (the President of the Interministerial Commission). In addition, 44 institutions and entities considered to be especially related to the subject of the procedure were notified. As a result of the above, a total 14,420 written allegations were received (735 via the e-mail address set up and the telematic register of the MITYC and the rest via the general register). Following examination of the allegations, an evaluation report was published on the site website.

In short, the mechanism in place for the designation of a site to host the CTS facility is a democratic process whose philosophy has been advocated in the performance of the COWAM generic designation projects, financed by the European Commission. These projects underline the need for voluntary acceptance by the local communities and their participation in decisions significantly affecting them, as is the case for a facility for the temporary storage or definitive disposal of radioactive wastes.

It is important to point out that once a candidate municipality has been selected to host the facility, the designation of the site does not differ from the licensing processes indicated in the RNRF for other nuclear facilities. In other words, a favourable report by the CSN will necessarily be required, this being followed by environmental impact assessment and the corresponding phase of public information, etc. (refer to the process described in Annex B). The CTS facility does not require any relevant characteristics different from those of any other industrial installation, beyond a suitable geographical setting and adequate geological characteristics.

6.5. Public information on safety

As has been pointed out in previous sections and in the previous national report in relation to the selection of a site to host the CTS facility, the CSN reported favourably on the generic conceptual CTS design developed by ENRESA in June 2006, establishing certain limits and conditions. In keeping with the philosophy of informative transparency of the Organisation, several references to this declaration of favourable appreciation have been published on its website, including a proposal of the declaration and a summary thereof. However, since the site has not yet been selected, the Nuclear Safety Council pointed out that the generic design would need to be completed in the future with intrinsic safety criteria associated with a specific site, since the characteristics of the site condition the design of the CTS facility.

6.6. International arrangements

Pursuant to article 37 of the Treaty constituting the European Atomic Energy Community (EURATOM), of which Spain has been a member since 1986, it is necessary to provide the European Commission with general data on all radioactive waste disposal projects (regardless of form) making it possible to determine whether the performance of such project might give rise to the radioactive contamination of the waters, soil or air space of another Member State.

During the period of the report, and as regards this article, information was provided to the European Commission on the José Cabrera nuclear power plant waste disposal plan, coinciding with the transfer of fuel assemblies from the plant pool to the ITS facility, prior to the initiation of dismantling. In 2008, the Spanish Government submitted a report to the European Commission with general data on the plan for the disposal of radioactive wastes arising as a result of dismantling of the plant[1]. Additional information was also provided in response to a further request from the Commission. After consulting with the Group of Experts set up pursuant to article 37 of the Treaty, the Commission reached a decision, considering that the performance of the plan for the disposal of radioactive wastes generated by dismantling of the plant, in any form, under both normal operating conditions and in the event of an accident of the type and magnitude contemplated in the general data provided, would be unlikely to give rise to the radioactive contamination of the water, soil or air space of another member State.

Article 7
Design and construction of facilities

Article 7: Design and construction of facilities

Each Contracting Party shall adopt adequate measures to ensure the following:

i) That spent fuel management facilities are designed and constructed such that there be adequate measures to limit the possible radiological consequences for persons, society and the environment, including those arising from uncontrolled releases or emissions;

ii) That during the design phase consideration is given to conceptual plans and, where appropriate, technical provisions for the decommissioning of spent fuel management facilities;

iii) That the technologies incorporated in the design and construction of spent fuel management facilities are backed by experience, tests or analyses.

7.1. Measures for the granting of authorisations

The general objective of radiological protection at spent fuel management facilities is established in the Nuclear Energy Act, article 38 of which 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*.

[1] *These general data were provided in accordance with the Recommendation of the Commission of December 6th 1999 relating to the application of article 37 of the EURATOM Treaty.*

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

- ✓ IS-26 on "General safety requirements applicable to nuclear facilities", and
- ✓ IS-29 on "Safety criteria at temporary storage facilities for spent fuel and high level wastes".

In particular, instruction IS-29 requires that the objective of radiological protection be taken into account by the licensee of the fuel storage facility in its design, construction and operation, in which respect the necessary measures shall be taken to ensure the following:

- ✓ Limitation, minimisation and control of the exposure of persons to radiation and of the release of radioactive materials to the environment.
- ✓ Limitation of the probability of events that might imply loss of control over any radiation source.
- ✓ Mitigation of the consequences of such events should they occur.
- ✓ Minimisation of radioactive waste generation.

This same instruction requires that the licensee of the facility demonstrate compliance with these objectives in the Safety Analysis, 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 requires that the request for the construction permit be accompanied by a Preliminary Safety Analysis containing at least the following information:

- ✓ Description of the facility, with the criteria adhered to in the design of the safety components and systems on which it depends.
- ✓ Analysis of foreseeable accidents and their consequences.
- ✓ Radiological analytical study with an estimate of potential environmental impact.
- ✓ Environmental surveillance programme based on the conclusions of the aforementioned study.

In the case of individualised temporary storage (ITS) facilities located on the sites of nuclear power plants, authorised as plant modifications in accordance with articles 25 and 26 of the RNRF, the request for authorisation of the modification shall be accompanied by the corresponding safety analysis.

These safety analyses are evaluated by the CSN prior to the granting of the corresponding authorisation by the Ministry of Industry, Tourism and Trade.

Furthermore, in accordance with the provisions of article 80 of the RNRF, the design of the storage casks or systems used at ITS facilities must be approved by the MITYC, following CSN evaluation of the corresponding Safety Analysis, the contents of which are detailed in the following CSN instruction:

- ✓ IS-20 on "Safety requirements relating to spent fuel storage casks", which also includes the design requirements.

These objectives and requirements have been taken into account in the safety assessment performed within the framework of the design approval for the casks and authorisation of the ITS facilities existing at the sites of the Trillo and Jose Cabrera nuclear power plants. As regards the ITS facility planned for the site of the Ascó nuclear power plant, its licensing follows the same procedure already established for the previous such installations. The approval for the design of

the storage system was granted to Enresa in December 2010, and the evaluation of the Safety Analysis submitted by the licensee with the plant modification request will be completed shortly.

In the case of the CTS facility, consideration will also be given to the design conditions contained in the favourable report on the generic design issued by the CSN in July 2006, in accordance with article 82 of the RNRF, as detailed in the previous report.

7.2. Forecasts regarding decommissioning

In relation to what is specified in point ii) of this Article regarding forecasts for decommissioning, it is pointed out that article 17 of the RNRF requires that the documentation to be submitted with *the request for the construction permit for nuclear facilities include technological, economic and financing forecasts for dismantling and decommissioning*.

These dismantling and decommissioning forecasts are dealt with to a larger extent in the request for the operating permit, as specified in article 20 of the RNRF.

7.3. Technologies used for spent fuel storage

The technology most widely used in Spain for the storage of spent fuel is the pool type. Experience of this type of systems at world level amounts to more than 50 years and many nuclear facilities have used it over this period. As long as there are no adverse water chemistry conditions, there would appear to be no limit as regards the time that fuel from light water reactors and with zircaloy and zirlo cladding may be kept using this storage mode.

The Trillo and José Cabrera nuclear power plants also use dry storage technologies for their fuel. In these cases storage is accomplished mainly in casks made of concrete or some other material having an additional coating of metal that provides the overall assembly with shielding properties and structural support against external demands. Some of these casks are used for both the storage (outdoors or in a building) and transport of spent fuel.

The technology used at Trillo nuclear power plant is based on the use of dual purpose metallic casks (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 in turn stored in a building constructed for this purpose.

The technology selected in the case of the José Cabrera nuclear power plant is based on the use of welded metallic capsules inserted in metal-concrete or totally metallic modules for the storage and transport functions, respectively. These containers are stored temporarily at the plant itself in an outdoor facility, also especially constructed for this purpose.

The dry storage system for spent fuel used at this nuclear power plant is made up of a set of three components: the multi-purpose capsule, the concrete and metal storage module or container and a transfer canister for transfer of the capsule from the pool to the storage facility. This system was approved by the MITYC in August 2006, following a favourable report from the CSN. The system also includes an additional container for off-site transport of the capsule, which has been approved as a B(U) type waste package.

Similarly to the case of this last plant, casks based on the same technology are planned to be used at Ascó nuclear power plant, with a view to having available sufficient capacity for the storage of its fuel from 2012 to the start-up of a centralised storage facility.

The official strategy for the temporary management of spent fuel consists of constructing a facility in which the storage of the spent fuel would be centralised along with that of other high activ-

ity wastes (CTS). It is foreseen that the future centralised storage facility will also use the dry storage option. There is a generic design for this facility, based on a vault type dry storage technology with cooling by natural convection of air. The design capacity is for 6,700 tU in fuel assemblies plus the vitrified high level wastes from the reprocessing of the fuel from Vandellós I and other wastes not open to disposal at El Cabril. The CTS facility will be an integral structure that will also incorporate the following:

- ✓ Spent fuel reception area or building.
- ✓ Process building for insertion of the fuel into the storage capsules.
- ✓ Auxiliary services and systems building
- ✓ Irradiated fuel capsule storage modules, each with two vaults with independent air inlets and outlets.
- ✓ Package storage shed for other high level wastes.

ENRESA submitted this generic design for evaluation by the Nuclear Safety Council (CSN) on the basis of the article of the RNRF on the Appreciation of new designs or models. In June 2006, the Plenary of the CSN agreed to report favourably on this request, establishing limits and conditions to be taken into account in the site study and the detailed design of the CTS facility.

Wide international experience is available in relation to the vault technology selected for the CTS facility, with design either only for the storage of spent fuel, only for high level vitrified wastes or in combined solutions. In all cases the safety requirements have been adequately fulfilled.

Article 8
Facility safety assessment

Article 8.Facility safety assessment

Each Contracting Party shall adopt adequate measures to ensure the following:

i) Prior to the construction of a spent fuel management facility, a systematic safety assessment and an environmental assessment shall be carried out, in keeping with the risk implied by the facility and covering its entire operating lifetime.

ii) Prior to the operation of a spent fuel management facility, updated and detailed versions of the safety assessment and the environmental assessment shall be prepared when considered necessary to complete the evaluations mentioned in paragraph i.

8.1. Legal and regulatory requirements

The measures for the performance of a safety assessment prior to the construction and operation of storage facilities are established in the Regulation on Nuclear and Radioactive Facilities (RNRF), which requires the licensee to submit a Preliminary Safety Analysis with the request for the construction permit and a Safety Study with the request for the operating permit.

The contents of each of these studies, PSA and SA, are also detailed in the RNRF, as referred to in Annex B of this report. In addition to a description of the site and the facility, these studies should include an analysis of the foreseeable accidents and their consequences and a radiological

analytical study estimating the potential radiological impact on the population and the environment.

This requirement is developed in safety instruction IS-26, applicable to nuclear facilities, and in particular in instruction IS-29 on spent fuel storage facilities, which emphasises the principle of defence in depth and specifies that the objective of the safety assessment to be performed by the licensee is to verify the capacity of the safety significant elements and barriers to prevent accidents and mitigate their consequences should they occur. These instructions also require the licensee to perform the following:

> *An analysis of the risks involved in operating the facility, in order to verify that all the 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 seriousness, 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 internal and external origin to be considered, including both those induced by natural phenomena and those caused by mankind.

Furthermore, IS-29 specifies that: *when a safety assessment identifies a risk that has not been considered previously, the necessary design changes should be performed or the necessary operating procedures should be established to control it or additional measures should be implemented*.

These safety-related technical standards require the performance of a periodic safety review at least once every ten years, by means of a systematic safety and radiological protection analysis.

As regards the environmental assessment referred to in this Article of the Convention, the Spanish legislation dealing with this issue, which incorporates the corresponding European Council and Parliament Directives, associates non-radiological environmental impact assessment with authorisation of the site, in all cases previous to construction.

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 process of plant periodic Safety Review. The operations for the replacement of the initial storage racks with other more compact units, in order to increase storage capacity, carried out at all the operating plants, have been performed as plant design modifications in accordance with articles 25 to 27 of the RNRF. The request for these modifications is accompanied by the corresponding safety analysis, along with the analysis and proposal of the modifications associated with this operation, as detailed in previous reports.

The licensing of the individualised temporary storage (ITS) facilities located on the sites of the Trillo and José Cabrera plants has included 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 temporary storage facility itself, handled in both cases as a nuclear power plant design and operation modification, in accordance with the procedure established in article 25 and subsequent articles.

Additionally, when the cask itself or one of the components of the storage system fulfils transport functions (such as the dual-purpose cask for Trillo and the cask for the transfer of the MPC capsule in the Jose Cabrera system, respectively), the aforementioned approvals and authorisations

are accompanied by the corresponding approval of the cask or component as a B(U) type transport package model, in accordance with the Transport Regulation and following submittal of the corresponding SS.

This same process is currently being carried out with respect to the ITS facility planned at Ascó nuclear power plant.

In the case of the centralised temporary storage (CTS) facility foreseen, licensing shall adhere to the process of authorisations established for nuclear facilities in the RNRF and described in Annex B of this report, with the possibility of the preliminary and construction permits being applied for simultaneously, as established in article 12.2 of the RNRF. In this case the process will be facilitated since the generic design of the facility has already been evaluated and a favourable report has been issued by the CSN, as long as the conditions required by the CSN with the declaration are taken into account, as specified in article 82 of the RNRF.

In any case, the safety analyses are evaluated by the CSN prior to the granting of authorisations by the Ministry of Industry, Tourism and Trade, in keeping with the functions attributed to the CSN by the law by which it was created and the provisions of the RNRF.

8.3. General framework of safety analyses and assessments

In general, the framework for the safety analyses and assessments of the storage facilities licensed to date has been based on the standards of the IAEA and on the standards of the country of origin of the technology.

In particular, in the assessment of the ITS facilities and the storage casks in use, consideration has been given to the requirements of this Joint Convention and to the specific standards of the IAEA (in particular Safety Series 116, 117 and 118 and DS 3.71, which is expected to replace the former). As regards the standards of the country of origin of the technology, consideration has been given to US 10 CFR 72, the Standard Review Plans and NUREG-1536 and US Regulatory Guide 3.62 “Standard format and content for the Safety Report for Onsite Storage of Spent Fuel Storage Casks”.

In the safety assessment of the generic design of the temporary storage (CTS) facility, consideration has also been given to 10 CFR 72, in view of its completeness, and to the requirements of NUREG-1567 (Standard Review Plan for Spent Fuel Dry Storage Facilities), in addition to the aforementioned IAEA standards. The assessment has included a comparative study of the international standards applicable to the design of a similar facility.

The areas of assessment in the case of the storage casks have included: a general description of the cask, the main design criteria, structural assessment, thermal assessment, assessment of the shielding and criticality analysis, as well as the operating procedures, acceptance criteria, maintenance procedures, protection against radiation, a chapter on accident analysis, another on quality assurance and one on operating limits and conditions.

In the safety assessment of ITS facilities, consideration is given also to the interface between the cask and its use at the nuclear power plant, including an evaluation of the plant documentation affected by the storage facility (Quality Assurance Programme, Operating Technical Specifications, Site Emergency Plan, Radiological Protection Manual and Spent Fuel and Radioactive Waste Management Plan).

In the case of the assessment of the generic design of the CTS facility, the areas evaluated have included the estimated inventory of spent fuel and wastes to be stored and their conditioning, the characteristics associated with the hypothetical site, design basis and design characteristics of the vault type installation, analysis of civil works, analysis of criticality and confinement, heat

removal systems, auxiliary systems (fire-fighting, electrical, instrumentation), safety requirements for the operating phase, radiological impact of normal operation and radiological consequences of design basis accidents, project quality assurance programme, security and criteria associated with dismantling of the plant.

This framework has materialised in the recently issued Council Instructions IS-20, IS 26 and IS 29, in particular IS-26 and IS-29, applicable to spent fuel storage facilities, which will be applied to the future licensing of the CTS facility, along with the reference standards indicated in the favourable report on the generic design issued by the CSN.

Article 9
Operation of facilities

Art. 9 Operation of facilities

Each Contracting Party shall adopt adequate measures to ensure the following:

i) The operating permit for spent fuel management facilities is based on appropriate assessments, as specified in article 8, and is predicate upon the completion of a start-up programme that demonstrates that the facility, as built, fulfils the design and safety requirements;

ii) The operating limits and conditions deriving from tests, operating experience and assessments, as specified in article 8, are defined and revised where necessary;

iii) The operating, maintenance, radiological surveillance, inspection and testing activities of spent fuel management facilities are carried out in compliance with established procedures;

iv) The engineering and technical support services required in all safety-related disciplines are available throughout the operating lifetime of spent fuel management facilities;

v) The licensee of the corresponding licence promptly notifies the regulatory body of safety-significant incidents;

vi) Programmes are established for the compilation and analysis of the pertinent operating experience and actions are taken depending on the results, where appropriate;

vii) Spent fuel management facility decommissioning plans are prepared and updated, when necessary, on the basis of the information obtained during the operating lifetime of the facility and the regulatory body examines these plans.

9.1. Operating permit: limits and conditions. Operating experience

The spent fuel storage pools (SFSP's) of all the nuclear power plants currently in operation have been evaluated and authorised as part of the licensing process of the plants themselves, as a result of which the design requirements and operating limits and conditions included in the safety and environmental assessments are part of the Operating Permits awarded to the licensees, on completion of the start-up programme (pre-nuclear and nuclear testing programme) that demonstrates that the facility, as built, fulfils the design and safety requirements.

In addition, the dual-purpose metallic cask storage facility is in operation at Trillo nuclear power plant, authorised as a design modification within the framework of the plant Operating Permit in force in accordance with the same licensing process as applied to the original 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 contained 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.

Likewise, following the granting in March 2008 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 during 2009. Ownership of these fuel assemblies has been transferred to ENRESA pursuant to Order ITC/204/2010, of February 1st, of the 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, granting the latter 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 said Order.

The procedures of the nuclear power plants contemplate the analysis of in-house and industry operating experience, this potentially leading to the performance of improvement actions in relation to both design aspects and operating procedures. Among the reports analysed are those generated by INPO/WANO, the US-NRC and suppliers.

Spent fuel operations are performed at the nuclear power plants in accordance with the OTS's and the Radioactive Waste Management Plan (PLAGERR), both of which are mandatory documents.

The OTS's establish the Operating Limit Conditions, their applicability, the necessary actions and the surveillance requirements necessary to comply with the limit conditions. They also contain the limit values for variables affecting safety, the actuation limits of automatic protection systems, the minimum conditions for operation, the programme for the periodic revision, calibration, inspection or testing of various systems and components and their operational control.

For the development and detailing of the OTS surveillance requirements, surveillance procedures are drawn up for performance by the different departments involved in plant operation.

9.2. Operating, maintenance, radiological surveillance, inspection and testing procedures

The nuclear power plants have procedures regulating the performance of different activities relating to the operation, maintenance, radiological surveillance and inspection of the structures, systems and equipment that form part of the spent fuel storage installations.

The facilities have detailed inventories of the fuel assemblies existing 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 and is in accordance with the corresponding OTS 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, including a list of the existing assemblies, accumulated burnup and the data of unloading from the reactor.

9.3. Engineering and technical support services

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

The contracts established with the suppliers and/or manufacturers of nuclear fuel contemplate technical support regarding the fuel assemblies supplied, including transmission of the characteristics and design of the assemblies, the operating limits to guarantee the fuel and the drawings and data required by the nuclear power plant as a result of the contracts drawn up between it and ENRESA, the company commissioned by the State to provide the Public Service in question.

9.4. Reporting of events

The OTS's of the nuclear power plants establish the conditions under which special reports should be drawn up whenever there are incidents of significance for the safety of their spent fuel storage facilities.

Reportable events are communicated to the CSN and to the competent governmental authorities using the formats of CSN Instruction IS-10. Special reports shall be sent to the CSN, as established in the OTS's.

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

9.5. Decommissioning

As established in the RNRF, the licensees of nuclear power plants draw up and update, where necessary, the decommissioning plans for their spent fuel management installations, using the information obtained during the operating lifetime of the facility. These plans are examined by the regulatory body.

Article 10
Spent fuel disposal

Article 10. Spent fuel disposal

If, in compliance with its legislative and regulatory framework, a Contracting Party decides to dispose of fuel in a final disposal facility, such disposal of spent fuel shall be carried out in accordance with the obligations established in chapter 3, relating to the disposal of radioactive waste.

In keeping with the most recent planning, the basic and preferential option for the long-term management of spent fuel and high level waste is considered to be temporary storage followed by transfer to a definitive disposal facility. As regards final management, the activities to be performed are aimed fundamentally at the consolidation and updating of the knowledge acquired, with advantage taken of international developments in this area. The activities to be performed over the coming years will be as follows:

- ✓ The generic designs for each host rock will be consolidated and alternatives to them will be contemplated as a result of improved understanding of components and processes and considering the criterion of recovery, over a defined period of time, of the wastes disposed of.
- ✓ The corresponding safety assessment exercises will be reviewed, with a view to updating them in accordance with the progress made in R&D programmes and in keeping with the revised designs. These studies should be updated to bring them into line with the new trends at international level (European Commission, IAEA, etc.) and the regulatory framework developed in Spain, as well as whatever new international criteria might arise for this type of facilities, and new scientific and technological progress occurring on the international scene should be included.

In parallel to the above, further efforts will be made in analysis and greater insight will be gained into the different definitive disposal alternatives, in close collaboration with the international progress made and projects undertaken in this field, with a dimension and scope in keeping with the research capabilities existing in the country.

In the longer term, and solely for the purposes of economic calculation and planning, a schedule is established that contemplates the start-up of a definitive disposal facility in the year 2050.

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Section H

Safety in the management of radioactive waste

Section H. Safety in the management of radioactive waste

ARTICLE 11
GENERAL SAFETY REQUIREMENTS

Article 11. General safety requirements

Each Contracting Party shall adopt appropriate measures to ensure that in all stages of radioactive waste management persons, society and the environment are adequately protected against radiological and other risks.

For this purpose, each Contracting Party shall adopt appropriate measures to:

i) Ensure that due attention is paid to criticality and the removal of residual heat produced during radioactive waste management;

ii) Ensure that radioactive waste generation is kept at the lowest possible level;

iii) Take into account the interdependencies between the different stages of radioactive waste management;

iv) Provide efficient protection for persons, society and the environment, applying adequate protective methods at national level, approved by the regulatory body, within the framework of its national legislation giving due consideration to internationally approved criteria and standards;

v) Take into account the biological, chemical and other risks that might be associated with radioactive waste management;

vi) Strive to avoid actions whose reasonably foreseeable repercussions on future generations are greater than those accepted for the present generation;

vii) Attempt to prevent undue burdens from being placed on the generations of the future.

11.1. MEASURES TO ENSURE THE MAINTENANCE OF SUBCRITICAL CONDITIONS AND HEAT REMOVAL

As has been indicated above, the Centralised Temporary Storage (CTS) facility contemplated in the GRWP in force, the generic design of which was reported on favourably by the CSN in June 2006, will house not only the spent fuel from the Spanish nuclear power plants but also the high and intermediate level wastes resulting from the reprocessing of spent fuel in other countries and other wastes that, in view of their radiological characteristics, are not able to be disposed of at the El Cabril definitive disposal facility.

In the design of the CTS facility, as in the case of the currently existing temporary storage installations for spent fuel, due attention has been paid to maintaining subcriticality and to heat removal during radioactive waste and spent fuel management, as described in Heading 4.1 of Section G.

The other high and intermediate level wastes that are expected to be stored at the CTS facility are not by nature susceptible to reaching critical conditions, with the exception of the fissile materials recovered during the reprocessing in other countries of Spanish fuel, these not currently being in Spain. Notwithstanding the above, limitations have been established regarding the content of fissile materials as part of the acceptance criteria to be fulfilled by waste packages for storage at the El Cabril facility.

As regards measures to guarantee heat removal, the situation is similar to that described above. Of the wastes mentioned, only the high level vitrified wastes, currently in France, generate heat in considerable quantities, this having been taken into account in the assessment of the Safety Analysis of the generic design of the CTS facility reported on favourably by the CSN . This issue will be studied in detail in subsequent phases and taken into account prior to the return of these wastes to Spain.

11.2. Measures adopted to ensure that radioactive waste generation is kept as low as possible

The principle of waste production minimisation is established in the Spanish legislation in the Nuclear Energy Act (Article 38, as worded in Law 33/2007, of November 7th, creating the Nuclear Safety Council), which requires the producers to adopt appropriate measures such that waste production be kept as low as possible, in terms of both quantity and activity, in the light of the scientific practice existing at each moment. The CSN has promoted the implementation of this practice by requiring ENRESA to make the best use of the definitive 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 operating nuclear power plants overall. These figures are very close to the minimum levels that are technically foreseeable, as a result of which no significant reductions are expected in the future.

A similar situation exists at the radioactive facilities, where joint efforts have also been made by ENRESA and the owners to reduce the quantities of radioactive wastes generated. During the period 1992 to 2003, the annual volume of wastes removed has been halved, from some 140 m^3 to approximately 70 m^3. As from 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 a year.

11.3. Measures adopted to take into account interdependencies between different stages of radioactive waste management

The different stages of LILW management carried out at the Spanish nuclear power plants are subject, among other things, to the regulatory licensing process prior to their operation. During this process, the licensee is specifically required to draw up and apply the so-called Process Con-

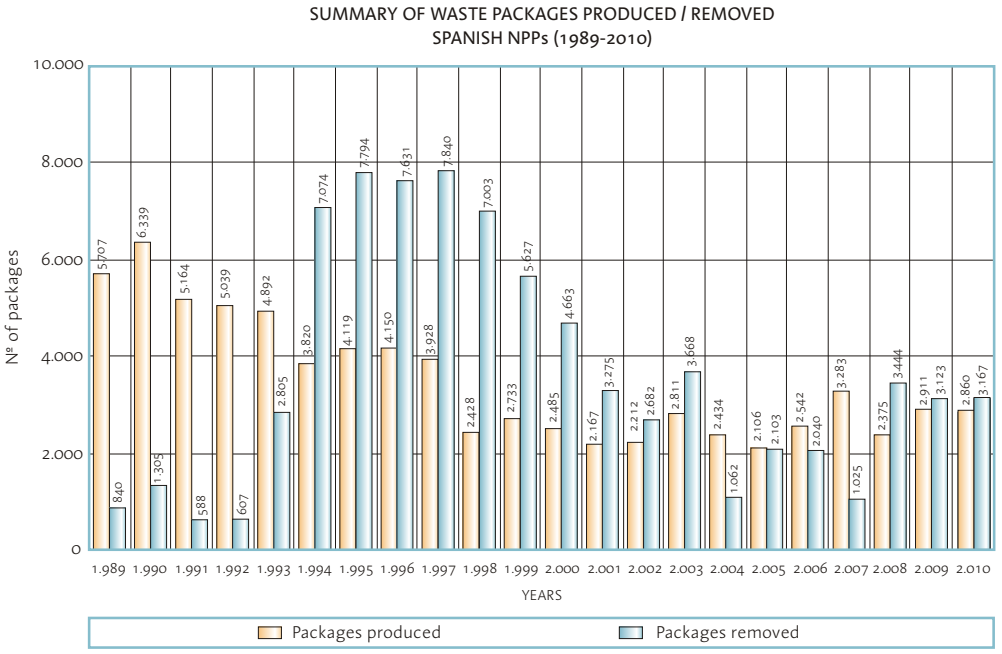

Figure 9: Waste packages produced-removed annually.

trol Programme (PCP) in the operation of the system for the treatment and conditioning of the wastes for their final disposal.

As regards 2nd and 3rd category radioactive facilities for medical, industrial or research purposes, Ministerial Order ECO/1449/2003 (Official State Gazette No. 134 of 05/06/2003) specifies the different aspects to be taken into account in managing the radioactive wastes from such installations.

The CSN required ENRESA to draw up 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, covering both the relationship between ENRESA and the waste producers and activities within the exclusive responsibility of ENRESA in the acceptance of different types of waste packages.

The acceptance criteria for low and intermediate level waste packages were established in accordance with the Ministerial Order of October 9th 1992. The operating permit currently in force for the El Cabril Disposal Facility, granted by Ministerial Order on October 5th 2001, determines that the criteria for the acceptance of wastes at this facility are part of the official operating documentation.

ENRESA has established a methodology for the acceptance of low and intermediate level and very low level wastes at the El Cabril disposal facility.

The producers of radioactive wastes at nuclear facilities are responsible for the conditioning of the waste packages such that they fulfil the acceptance criteria. Enresa is required to verify by means of a process of preliminary acceptance that the waste packages comply with the aforementioned requirements. A surveillance system has also been established based on inspections on reception, documentary and in-the-field controls of waste production and the performance of verification tests scheduled on the actual packages received.

In 2010, the CSN required ENRESA to draw up specific acceptance processes contemplating generation by the waste producers of final disposal units for direct incorporation in the cells at El Cabril. To date, these processes have been carried out exclusively at the ENRESA installations at the El Cabril disposal facility.

11.4. Measures for the efficient protection of persons, society and the environment

The provisions of the Spanish regulations that relate to the protection of persons and the environment are included in Section E of this report. Specifically, article 38 of the Nuclear Energy Act (NEA) requires the licensees of nuclear and radioactive facilities to adopt appropriate measures in all the stages of spent nuclear fuel and radioactive waste management in order to suitably protect persons, property and the environment against radiological risks, in the present and the future.

The aforementioned legal provision underlines the importance of direct protection mechanisms for persons and the environment and incorporates the point of view of deferred safety, since in radioactive waste management the remaining radiological risk for persons and the environment needs to be controlled over long periods of time.

During the licensing and control of the El Cabril facility, the safety principles and criteria emanating from international organisations such as the International Commission on Radiological Protection and the International Atomic Energy Agency have been considered to be directly applicable, and specific safety requirements established in the standards of other countries housing the facilities taken as a reference.

11.5. Measures for the consideration of biological, chemical and other risks that may be associated with radioactive waste management

The biological, chemical and other risks associated with the management of radioactive wastes are regulated by limitations on the content of substances in the wastes definitively disposed of at the El Cabril Disposal Facility.

In this respect, a fundamental component in preventing these risks is the acceptance criteria for this disposal facility, which among other restrictions include those relating to minimisation of the presence of substances whose main potential risk does not arise from radioactivity and those potentially producing exothermal chemical reactions. The producers are responsible for declaring the presence of toxic, chemical or biological substances in their radioactive wastes and for minimising the generation of such substances and identifying them in order for ENRESA to be able to draw up an inventory of quantities present at the facility. ENRESA collaborates with the technical staff of the nuclear power plants to deal with specific aspects of this problem.

The environmental impact declaration process to which the nuclear facilities are subjected as part of the process of authorisation and licensing is another preventive method used to address the issue of biological and chemical risk. As pointed out in section A.2, the Ministry of the Environment and Rural and Marine Affairs is responsible for approving the Environmental Impact Statement during projects dealing with these facilities.

11.6. Measures to prevent repercussions for future generations greater than those permitted for the present generation

Included in this course of action are the criteria issued by the CSN in its Six-Monthly Report to the Congress and Senate of December 31st 1985, according to which:

> *The basic objective of radioactive waste disposal facilities, from the point of view of nuclear safety and radiological protection, is to guarantee that the radioactive wastes are isolated from mankind and the environment, such that potential releases of nuclides do not give rise to unacceptable exposure of persons to radiation.*

In relation to the above, it is indicated that the radiological acceptance criterion established by the CSN to be considered for the long-term presence of wastes on site corresponds to an individual level of risk lower than 10^{-6}/year, or the risk associated with an annual dose equivalent for individuals in the critical group of less than 0.1 mSv.

Preventing actions that might have unacceptable repercussions for future generations implies the planning and implementation of preventive measures within a context of uncertainty, for which reason the analysis of the uncertainties involved in the long-term performance of radioactive waste disposal systems and in the assessment of their consequences is a habitually considered issue.

11.7. Measures to prevent undue burdens for future generations

The current legal framework establishes specific measures relating to the assignment of responsibilities, the provision of funds for the financing of the activities involved and forecasts regarding the needs for institutional controls.

In this respect, the current legislation establishes the responsibilities of the different agents involved in waste management: the Ministry of Industry, Tourism and Trade, the regulatory body (CSN) and ENRESA. In relation to this section of the Joint Convention, it underlines the fact that the legal framework provides for the constitution and application, mechanisms for management and guarantee of the economic fund set up for waste management. The Law also establishes that the State will assume the ownership of the radioactive wastes once these have been definitively disposed of and also provide whatever surveillance might be required following the decommissioning of a nuclear or radioactive facility once the time period established in the corresponding authorisation has elapsed.

The El Cabril LILW disposal facility is conceived on the basis of a concept of passive safety that applies throughout its operating lifetime and during the decommissioning phase. Passive safety means that after decommissioning the facility will not depend on continuous and far-reaching active measures but will be subject to active and passive institutional controls reinforcing its safety and ensuring compliance with the safety criteria specified by the regulatory authorities.

Article 12
Existing facilities and past practices

Article 12.Existing facilities and past practices

Each Contracting Party shall promptly adopt suitable measures to examine the following:

i) The safety of any radioactive waste management facility existing at the moment in which the Convention enters into force with respect to the Contracting Party in question and ensure that, when appropriate, all reasonably feasible improvements are performed to increase the safety of the said facility;

ii) The results of previous practices in order to determine if an intervention is required for radiological protection reasons, bearing in mind that the reduction in the detriment deriving from dose reduction should be sufficient to justify the damages and costs, including the social costs, of the intervention.

12.1. Measures adopted to examine the safety of the El Cabril facility

The El Cabril facility for the definitive disposal of low and intermediate level wastes is the only one existing in Spain for this purpose. The El Cabril facility rests on the concept of a surface repository for radioactive waste disposal with engineered barriers.

The El Cabril nuclear facility currently has an operating permit issued by Ministerial Order on October 5th 2001 which will be valid until such time as the volume available for the disposal of low and intermediate level radioactive wastes in the existing cells is saturated.

In 2008, the extension of the facility through the construction and operation of four cells for very low level wastes was authorised.

With a view to examining the safety of the El Cabril facility, the corresponding safety assessments were performed prior to the construction and operation of both the installation for low and intermediate level wastes and the one for very low level wastes.

In addition to the safety assessment performed by ENRESA, as the licensee of the facility, the CSN also carries out independent assessments both during the processes of authorisation and during subsequent design modifications potentially affecting the immediate and long-term safety of the installation.

The safety assessment of the facility is a continuous process that is normally carried out by means of:

a) Periodic Safety Reviews (PSR's), with a frequency of ten years, the objective of which is to perform an overall assessment of safety and radiological protection at the facility, analyse the experience acquired and allow the licensee to enter into commitments for the implementation of possible improvements, taking into account the current situation and whatever new technological or regulatory circumstances might have arisen.

b) Regulatory control activities carried out by the CSN by means of the evaluation, inspection and control of the El Cabril disposal facility, with a view to ensuring compliance with the standards and conditions set out in its operating permit.

c) Implementation and tracking of surveillance and control programmes ensuring that the structures, systems and components affecting safety and radiological protection during operation of the facility and in the long term are capable of fulfilling their design function and that their performance meets the specifications of the design basis, in accordance with the complementary instructions issued by the CSN.

12.2. Measures adopted to examine safety in the management of low and intermediate level wastes at Spanish nuclear facilities

12.2.1. Treatment and conditioning of low and intermediate level radioactive wastes

Examining the safety of the low and intermediate level waste management installations in place at the Spanish nuclear facilities is included in the on-going safety review programmes of these facilities, the aim being to maintain the level required in the authorisations and improve it in the light of technological progress and new legal requirements.

Also established at the Spanish nuclear facilities is a ten-year Periodic Safety Review (PSR) programme that includes analysis of the operating experience of the waste management systems and the foreseen improvement processes.

Furthermore, the objective of the mandatory Radioactive Waste Management Plan (PLAGERR) document is to establish criteria and instructions ensuring that the management of the radioactive wastes generated at the facilities is safe and optimised in the light of progress made in the standards and technology. It should also guarantee that no radioactive wastes are managed via conventional routes.

All the Spanish nuclear facilities have now drawn up and submitted to the CSN the PLAGERR's updated in accordance with Council safety guide 9.3.1

12.2.2. Safety in the management of very low level wastes open to conventional management via declassification

In accordance with the system established in Spain for the declassification or clearance of waste materials, based on the technical directives and recommendations of the European Union, the facilities are required to have a specific authorisation for the management of wastes via conventional routes.

To date the practice of authorising the declassification of certain streams of waste materials has continued at the Spanish nuclear power plants.

Regulatory efforts continue to focus on improving the processes of characterisation and on implementing methodologies in this area allowing for the optimisation of the resources required for performance without negatively affecting the level of quality required.

During 2011 the publishing of a CSN instruction is expected, with a view to establishing criteria for the radiological control of waste materials prior to their leaving the radioactive waste zones (RWZ) of the nuclear facilities for conventional management, along with the technical documentation required to support requests for authorisation of waste material releases.

The Instruction proposed establishes the criteria to be considered for the radiological control of waste materials generated in the controlled zones of nuclear facilities, in order to determine as accurately as possible which of these materials should be subject to processes of declassification in accordance with the legal framework in force and which might be considered unaffected due to their not presenting any detectable radioactive contamination.

In this way, the Instruction consolidates the process of categorising waste materials, establishing the categories of affected and unaffected. Also determined are the requirements to be considered by the licensee to perform the aforementioned categorisation and the preliminary radiological

characterisation to which waste materials must be subjected prior to declassification, in order to check that their radioactive content does not exceed the previously established levels.

For the determination of these requirements, the current situation of the nuclear facilities and their operating procedures for the radiological control of waste materials have been analysed and the European Commission recommendations referring to this issue and included in the documents Radiation Protection 122 p.1, Radiation Protection 89 and Radiation Protection 113 have been considered as a reference. Also taken into account have been the American methodological tools Marsame and Marssims.

12.3. Measures adopted to examine safety in low and intermediate level waste management at Spanish radioactive facilities

The strategies for the management of the solid radioactive wastes generated at the Spanish 2nd and 3rd category radioactive facilities are based on temporary storage for their radioactive decay until such time as their radioactive content is such that they may be managed as conventional wastes, outside the radiological regulatory framework. Nevertheless, ENRESA also collects radioactive wastes from these facilities for transfer to the El Cabril disposal centre for conditioning and disposal.

In June 2003, Ministerial Order ECO/1449/2003 was published (Official State Gazette No 134 of 05/06/2003), determining the specific technical and administrative requirements for the management of solid waste materials with radioactive contents under suitable conditions of safety and radiological protection during all the corresponding phases, from generation to final disposal, in relation to 2nd and 3rd category radioactive facilities at which non-encapsulated radioactive isotopes are handled or stored.

A project is currently being performed by the CSN to analyse the declassification requirements established in Ministerial Order ECO/1449/2003, in order to determine whether it should be updated in the light of the experience acquired during its period of validity and of the European Union and IAEA recommendations in this area.

Article 13
Siting of projected facilities

Article 13. Siting of projected facilities

1. *Each Contracting Party shall adopt adequate measures to ensure the establishment and application of procedures for projected radioactive waste management facilities, for the following:*

   i. *Evaluation of all pertinent factors relating to the site and that might affect the safety of the facility during its operational lifetime, as well as that of a final disposal facility subsequent to its decommissioning;*

   ii. *Evaluation of the probable repercussions of the facility on the safety of persons, society and the environment, taking into account the possible evolution of the conditions at the site of the disposal installations following closure;*

iii. Supply of information to the members of the public on the safety of the facility;

iv. Consultation with Contracting Parties located in the vicinity of the facility, to the extent to which they may be affected by it, and supply to them, on request, of general data relating to the facility, allowing them to assess the probable consequences of the facility for safety in their territory.

2. For this purpose, each Contracting Party shall adopt appropriate measures to ensure that such facilities do not have unacceptable effects on other Contracting Parties, in accordance with the general safety requirements of article 11.

Spain has provided an overall answer to the issue of low and intermediate level radioactive waste (LILW) management through 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 foreseeable increase in the wastes to be managed as a result of the dismantling of the nuclear power plants, including the dismantling of the José Cabrera plant initiated in 2010, and of the possibility of incidents at other installations, a complementary installation was designed for the definitive disposal of very low level radioactive wastes at the El Cabril disposal facility, the first cell of which (of a total of four planned cells) was started up during the period of the report, as specified in article 13.1.1. The construction of the three remaining cells will be undertaken as the waste management capacity so requires.

As regards the management of HLW and SF, and as has been explained in Section B, the construction of a centralised disposal facility is currently foreseen for the coming years; in this respect, part of the process for the siting of this facility and its associated technology centre has been carried out throughout 2010.

13.1. Forecasts regarding new radioactive waste management facilities

13.1.1. Low and intermediate level wastes (LILW)

Since October 2008 the disposal of very low level radioactive wastes has been undertaken in a complementary installation at the Sierra Albarrana solid radioactive waste disposal facility (El Cabril), following an authorisation for start-up granted by the Ministry of Industry, Tourism and Trade on July 21st 2008, following a favourable report by the Nuclear Safety Council.

The design of this facility contemplates four disposal cells, numbered 29, 30, 31 and 32 (see Figures 10 and 11), with a total capacity for 130,000 cubic metres of VLLW (this covering the needs foreseen in the General Radioactive Waste Plan), separated from the platforms on which the previously existing waste disposal cells are located. Each of the four cells planned has a disposal capacity of between 30,000 and 35,000 cubic metres. The first cell (cell 29) started its operation in 2008 and, since the production of VLLW is not constant over time, the three others will be constructed over a prolonged period, during the operation of the previous cells and depending on actual needs, up to the maximum authorised volume of VLLW.

As each of the disposal cells is filled, they will be closed and finally covered with several layers of earth, clay and gravel, among other components, and a final layer of topsoil.

Figure 10. Aerial view of the very low level waste facility.

13.1.2. High level wastes (HLW)

As has been explained in Section B, the temporary management of this type of wastes will be undertaken along with that of spent fuel, this requiring a centralised storage facility. This facility has been described in Section G, sub-section 6.1.

The decision regarding the definitive disposal facility for spent fuel and high level waste has been postponed, as a result of which no installation of this type has yet been projected.

13.2. Criteria for the assessment of safety significant factors relating to the site

A distinction is made in this section between Low and Intermediate Level Wastes (LILW), all of which may be disposed of at the El Cabril facility, and High Level Wastes (HLW), which include those whose radiological characteristics make them unacceptable for disposal at this centre.

a) LILW

The criteria and factors taken into account for the El Cabril disposal facility, which were presented during the process of licensing of the installation prior to its start-up 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 to the environment depends on two factors:

- ✓ The magnitude of potential releases of radionuclides, which in turn depends on the physical-chemical form of the wastes disposed of and on the number of natural and artificial barriers to their migration.
- ✓ The nature of the release, depending on the quantities and types of radionuclides contained in the wastes.

These factors were taken into account in the Safety Analysis (SA) for the El Cabril disposal facility. The assessment was performed in keeping with the specific standard applicable to the reference facility, which being French was the Fundamental Safety Rule I.2. This Rule establishes the concept of intrinsic safety, which consists basically of requiring the following of the disposal system (waste and engineered barrier):

- ✓ Minimisation of the transfer of radionuclides to the environment during the operating and surveillance phases;
- ✓ In the phase of free use, the basing of safety on limitation of the inventory and on the characteristics of the geological barrier.

Also taken into account were the two fundamental criteria to be presented by a site for this type of facility: isolation with respect to surface and groundwaters and control of discharges in the event of releases of activity as a result of assumed failures.

This Rule also establishes the design lifetime of the waste isolation devices (engineered barriers) at a maximum 300 years. Consequently, at the El Cabril disposal facility it is estimated that the surveillance and control phase should not exceed this period. This duration may be re-evaluated on the basis of the activity actually disposed of, lower than the envelope considered in the radiological impact analysis, at the end of the operating phase.

The VLLW installation started up in 2008 constitutes a modification to the initial design plans of the disposal facility. In compliance with the Spanish standards, and in particular the RNRF, its construction required authorisation for the modification of the previously 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 installation includes pertinent information on the criteria for evaluation of factors influencing safety.

The following criteria of suitability have been taken into account in weighting the characteristics of the site, these being revised periodically in the context of the periodic review of the facility, which is performed at least once every ten years:

1. Adequate lithological characteristics.
2. Low and tectonically stable seismic activity.

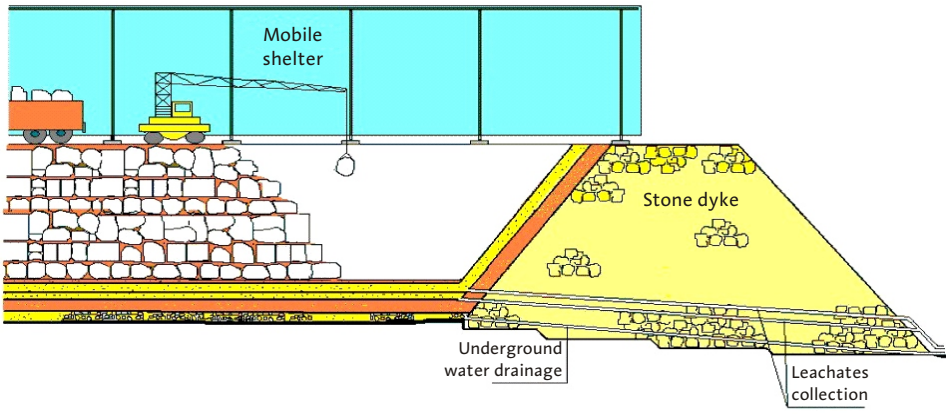

Figure 11. Detail of a cell under construction

3. Known and controllable hydrogeology.
4. Known hydrogeochemistry.
5. Smooth or levellable topography not subjected to flooding.
6. Adequate geotechnical properties.
7. Conservation 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

In general, aspects relating to evaluation of the site are taken into account throughout all the phases of licensing of nuclear facilities and are in fact the subject of a specific authorisation, the preliminary authorisation. This authorisation, which is accompanied by a characterisation study of the site and of the area of influence of the facility, includes sufficient data on those parameters of the site that might impact nuclear safety or radiological protection, including demographic and ecological data, and on activities relating to land development. The scope of these studies depends on the complexity and lifetime of the installation.

13.3. Criteria for the assessment of radiological repercussions on the environment and surrounding population

As in the previous section, a distinction is made between Low and Intermediate Level Wastes (LILW) and High Level Wastes (HLW).

a) LILW

When the SA was performed for the El Cabril disposal facility, an important part of it related to the assessment of the potential radiological impact of the site during the three phases of operation of the facility:

- ✓ In the operating phase, activities relating to waste handling and treatment were studied,
- ✓ In the surveillance, control and free use phases, consideration was given to situations referring to the performance of the disposal facility itself.

Scenarios of normal operating and accident situations and of human intrusion during the phase of free use were analysed. In general, the selection of specific hypotheses for each of these situations was performed by rounding up the doses to the critical individual, such that these situations might be considered as the most penalising from the point of view of impact, for which a maximum level was established.

As in the case of the previous installation, the VLLW facility is required to fulfil safety objectives oriented towards the protection of persons and the environment.

The VLLW installation is a modification of the existing facility, for which reason it was included in the SA of the El Cabril disposal facility, using the same criteria and methodology and without varying the maximum inventory of radioactivity authorised for it. As in the previous SA, the sit-

uations 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 had a dual objective:

- ✓ The development of acceptance criteria for the definitive management of VLLW.
- ✓ The checking of an acceptable level of protection for human health and the environment at present and in the future.

The methodology for performance is based on that established in international forums, such as the ISAM and ASAM projects promoted by the IAEA, and includes the following main elements:

- ✓ The context of the study, identifying its timeframe, objectives, radiological protection and safety criteria, etc.
- ✓ Description of the system or of the characteristics of its main components: wastes, operating practices, design of facilities, etc.
- ✓ Development and justification of scenarios and their evaluation. These scenarios fulfil the two aforementioned objectives.
- ✓ Analysis of results.

b) HLW

As has been pointed out above, the Centralised Temporary Storage (CTS) facility foreseen in the GRWP in force, the generic design of which was approved by the CSN in June 2006, is designed to house all the fuel assemblies from the Spanish nuclear power plants, the high and intermediate level wastes from reprocessing of all the fuel assemblies from Vandellós I NPP and other wastes that, in view of their radiological characteristics, cannot be disposed of at the El Cabril facility.

The measures for assessment of the radiological repercussions on the environment and surrounding population corresponding to the favourable declaration of the CSN on the generic design of this facility, the phase previous to licensing, are included in Section G, Sub-section 6.2 of this report, relating to spent fuel. The contents of this section are applicable also to HLW, since the facility is the same in both cases.

No facility is projected in Spain for the definitive disposal of HLW.

13.4. Public information on the site selection process

During the period of this report there has been no site selection process for LILW nor any specific legal development in this respect.

As regards the centralised temporary storage facility, which in addition to SF is expected to house HLW and other intermediate level wastes that, in view of their characteristics, cannot be accepted at El Cabril, the process of public information on site selection is described in Section G, sub-section 6.4.

13.5. Public information on facility safety

The legal provisions and practices relative to public information on the safety of radioactive waste management facilities are the same as those described in Section G, sub-section 6.5.

As regards the CSN, this is due to the fact that the said section describes its obligations to provide access for the public to information on nuclear and radioactive facilities and, therefore, covers the management of the radioactive wastes generated at all such installations, including nuclear power plants, other nuclear facilities such as El Cabril, fuel cycle facilities and installations using radioisotopes in medicine, industry, research and teaching.

As regards the setting up of a local information committee, this refers only to the nuclear power plants and, therefore, to the management and storage and disposal of radioactive wastes generated at them.

13.6. International arrangements

In compliance with article 37 of the EURATOM Treaty, and as has been pointed out in article 6.6 of Section G, Spain is required to provide the European Commission with general data on all radioactive waste disposal projects that might lead to the radioactive contamination of the waters, land or air space of other Member States.

The Spanish experience of compliance with this article for radioactive waste disposal projects is limited to the arrangements made to obtain the operating permit for the El Cabril facility in 1992, with the exception of the radioactive wastes to be disposed of as a result of dismantling of the José Cabrera nuclear power plant, this process being described in article 6.6 of section G.

Article 14
Design and construction of facilities

Article 14. Design and construction of facilities.

Each Contracting Party shall adopt adequate measures to ensure the following:

i) Radioactive waste management facilities are designed and constructed such that there be adequate measures to limit possible radiological consequences for persons, society and the environment, including those arising from uncontrolled releases or emissions;

ii) Consideration is given in the design stage to conceptual plans and, where appropriate, technical provisions for the decommissioning of radioactive waste management facilities other than definitive disposal installations;

iii) Technical provisions are prepared during the design stage for the closure of radioactive waste definitive disposal facilities;

iv) The technologies incorporated in the design and construction of radioactive waste management facilities are endorsed by experience, testing or analysis.

At present the Spanish LILW management facilities are located either at the installations generating these wastes or at the El Cabril facility, where their definitive disposal is undertaken. The first of these have been evaluated and authorised within the process of licensing of the generating facilities themselves, as a result of which this article focuses mainly on the El Cabril facility.

14.1. Limitation of possible radiological consequences for persons, society and the environment

In accordance with the RNRF (art. 12), the construction permit empowers the licensee to initiate the 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, particularly significant among which is the Preliminary Safety Analysis (PSA). The 2008 revision of the RNRF adds the Autonomous Community to the list of addressees of this documentation, with the capacity to present allegations.

In accordance with the RNRF (art. 12), the El Cabril disposal facility obtained its construction permit by Ministerial Order on October 31st 1989. The construction of the new complementary facility for VLLW at El Cabril , which initiated its operation in 2008, has been undertaken as a design modification proposal (DMP) relating to the existing installation and has been performed on the basis of the same safety criteria.

The general safety objectives defined in the design and construction of the El Cabril facility have been as follows:

1. Immediate protection, during the operating phase, and deferred protection, during the surveillance and control and free use phases, for persons and the environment.
2. Allow for the free use of the site within a reasonable time, i.e., allow the land to be used for any purpose without limitations caused by the facility.

Compliance with the objectives is accomplished through the application of the following basic criteria:

- ✓ Isolation of the radioactivity stored from the surroundings (or biosphere) during the operating and surveillance and control phases, thanks to the suitability of the site and the elements of the facility.
- ✓ Limitation of the radionuclides present in the disposal units, such that the radiological impact is acceptable under any foreseeable circumstance and the residual activity is compatible with free use of the site.

The operating permit in force, including the design modification of the El Cabril facility, authorises ENRESA to place disposal units fulfilling the acceptance criteria in its corresponding disposal cells, without the intention to subsequently recover them, and to close these cells with definitive covering layers. Prior to undertaking this last step, the covering must be approved by the CSN.

14.2. Technical provisions for the decommissioning of radioactive waste management facilities

In accordance with the standards in force, the documentation submitted with the request 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 and provides that the CSN shall define the scope, contents and development of the necessary documentation.

In the particular case of the nuclear power plants, the owners are obliged to carry out preparatory activities at the end of their operating lifetime in order for ENRESA to accept ownership and begin dismantling activities.

14.3. Technical provisions for closure of the radioactive waste disposal facility

The PSA for the El Cabril disposal facility, submitted in order to obtain the construction permit, includes the systems designed for closure of the facility and those that will be operative during the surveillance and control 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 disposal works and their annexes (coverage, water networks), the disassembly and removal of the operating installations (constructions and equipment) no longer required and the installation of all the elements required for the surveillance and control phase not previously installed.

The seepage control network, which will operate with minimum maintenance requirements during the operating and surveillance and control phases, is designed for the easy identification and location of any possible anomaly in any of the disposal cells. In this respect, the piping of the network has been installed in accessible reinforced concrete underground galleries running longitudinally below the cells, these being designed with a slope and dimensions sufficient to ensure drainage by gravity to the final control tank. ENRESA will continue to own the land, thus avoiding any deterioration as a result of uncontrolled human intervention and ensuring the surveillance and maintenance of the covering, seepage control network and monitoring devices.

Before initiating the surveillance and control period, a specific Environmental Radiological Surveillance Programme shall be drawn up and submitted for approval by the authorities prior to closure. This Program will be based on the experience acquired, the checks performed and the resources used during the operating period.

14.4. Technologies used for radioactive waste management

Nuclear power plants

The radioactive waste management facilities existing at the Spanish nuclear power plants were designed and constructed as part of the plants themselves, in accordance with the standards applied at the reference plants, the United States and Germany. The introduction and development in the Spanish standards of the concept of the "reference plant" guarantees the incorporation of consolidated and proven technology, without preventing the introduction of consolidated innovations.

El Cabril disposal facility

The conceptual development of the disposal facility was based on the experience acquired in those countries that possessed this type of installations and a set of basic safety objectives and technical options. As a result of these considerations the surface disposal model was selected, with the adoption of engineered barriers, the concept developed using the French disposal centres as a reference.

Prior to the start-up of the El Cabril LILW disposal facility, and in accordance with the standards then in force, the installation was subjected to a programme of pre-operational verifications that included testing and checking methods to guarantee the correct operation of the different facilities and equipment, in relation both the nuclear safety and radiological protection and to the applicable industrial and technical standards. Analogously, the auxiliary installation for

VLLW takes as a reference the facilities operating in other countries, fundamentally the TFA facility at Morvilliers, in France. In this case the technologies to be used have already been experienced operationally in Spain.

Article 15
Assessment of facility safety

Article 15. Assessment of facility safety.

Each Contracting Party shall adopt adequate measures to ensure the following:

i) The performance, prior to the construction of radioactive waste management facilities, of a systematic safety assessment and environmental assessment, in keeping with the risk posed by such facilities and covering their operating lifetimes;

ii) Furthermore the performance, prior to the construction of radioactive waste disposal facilities, of a systematic safety assessment and environmental assessment for the period following closure and assessment of the results on the basis of criteria established by the regulatory body.

iii) The preparation, prior to the operation of radioactive waste management facilities, of updated and detailed versions of the safety assessment and environmental assessment whenever considered necessary to complement the assessments mentioned 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 existing in Spain are the treatment plants and temporary storage facilities located 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 temporary storage of wastes at the El Cabril disposal facility, which also has licensed installations for the definitive disposal of low and intermediate level wastes and for very low level wastes.

The radioactive facilities at which ionising radiations are applied for medical, industrial and research purposes also have adequate infrastructures for the temporary storage of the wastes they generate, until such time as they are delivered to the authorised management company (ENRESA).

Radioactive waste management facilities may be classified as nuclear or radioactive facilities, depending on whether or not they handle nuclear substances, as established in the Nuclear Energy Act and the RNRF in force. Section E and Annex B of this report include detailed information on the process of authorising such facilities.

The process of authorisations required of nuclear and radioactive facilities involved in the nuclear fuel cycle has remained unaltered, as a result of which the information is as included in the successive national reports relating to this Joint Convention.

By way of a summary, attention is brought to the need to submit a Preliminary Safety Analysis (PSA) in support of the construction permit, this containing both a description of the site and

surrounding area and updated data on parameters having an impact on safety and radiological protection.

In the case of radioactive waste management facilities associated with radioactive installations other than those belonging to the nuclear fuel cycle, an exclusive operating permit will be required. Applications for this permit shall be accompanied by a "descriptive report", which shall include among other things the solid, liquid and gaseous radioactive waste management systems.

The application shall also be accompanied by a Safety Analysis (SA), which shall consist of an analysis and assessment of the risks that might arise as a result of the normal operation of the facility or of some incident. Sufficient data shall be included for the competent authorities to be able to analyse the risks posed by the facility, independently of that submitted by the applicant.

15.2. Measures adopted prior to the construction of low and intermediate level radioactive waste disposal facilities

In Spain there is a facility for the definitive disposal of low and intermediate level wastes in operation (1992) and another for the disposal of very low level wastes (2008), both at the so-called El Cabril disposal facility. This is a nuclear facility, for which reason the system of authorisations and the safety assessments dealt with in Section E of this report were applicable to it prior to its construction.

The information relating to the measures adopted prior to the construction of the installations for definitive waste disposal has remained unaltered and is, therefore, that included in the successive national reports relating to this Joint Convention. The fundamental aspects are summarised below.

All the safety-related requirements relating to the definitive disposal facilities must be taken into account, as regards both the operating phase and the phase that will begin following decommissioning.

Prior to constructing the facility, the licensee draws up the Preliminary Safety Analysis and submits it for approval by the competent authorities; this includes analyses of the possible future evolution of the disposal system, taking into account the mechanisms for the release and migration of radioactivity, the routes for exposure of the members of the public and analysis of the radiological consequences of the human intrusion scenarios postulated.

The fundamental objectives considered in the conceptual design of the facility were as follows:

1. The immediate and deferred protection of persons and the environment.
2. Limitation of the duration of the surveillance phase to no more than 300 years.

The conceptual design of the facility shall allow for reliable, continuous and efficient surveillance throughout the operating and surveillance phases, in order to verify the absence of any dissemination of radioactive substances.

The conceptual design of the facility and control devices and the works performed shall allow for efficient intervention during the operating and surveillance phases, this including the recovery of the wastes if necessary, in the hypothetical event of an eventual dissemination of radioactive substances. During the operating and surveillance phases it shall be possible to maintain the integrity and characteristics of the covering materials as an integral part of the second confinement barrier.

15.3. Measures adopted prior to the operation of low and intermediate level radioactive waste management facilities

The information relating to the measures adopted prior to the construction of the installations for definitive waste disposal has remained unaltered and is, therefore, that included in the successive national reports relating to this Joint Convention.

A summary of the fundamental aspects is included below.

The safety assessment performed prior to authorisation of the facility is made up of three differentiated parts:

- ✓ Safety assessment during the operating phase.
- ✓ Safety assessment during the surveillance phase, with institutional supervision for a maximum 300 years.
- ✓ Safety assessment for the period after 300 years.

In each of these phases, selected radiation exposure scenarios are postulated and analysed from the radiological point of view.

The nature and quantity of the radionuclides that may be stored at the facility shall be determined, and the possible routes for their transfer to the environment shall be analysed for all situations considered to be plausible, taking into account their physical and chemical form and the waste conditioning mode. The studies aim to demonstrate that the transfers produce a radiological impact that is as low as possible and in any case below the restrictions established. It shall also be demonstrated that radioactive decay during the surveillance phase proposed will allow for the free use of the site.

These studies have allowed the licensee to establish average, maximum and limit values for the long-term mass activity of the radionuclides in the waste packages and the total acceptable quantity of these radionuclides.

The approach adopted in Spain for the performance of the safety assessments is that recommended by the IAEA, which implies determination of the Features, Events and Processes (FEP's) that might influence long-term performance.

The model preparation approach selected must be documented clearly and completely, along with the other aspects considered as it develops. The documentation must ensure a record allowing for the traceability of all the hypotheses adopted and decisions taken during development and application for the preparation of the models selected.

Article 16
Operation of facilities

Article 16 Operation of facilities

Each Contracting Party shall adopt adequate measures to ensure the following:

i) The operating permit for a radioactive waste management facility is based on appropriate assessments, as specified in article 15, and is conditioned to the completion of a start-up programme demonstrating that the facility as built meets the design and safety requirements;

ii) The operating limits and conditions deriving from tests, operating experience and assessments, as specified in article 15, are defined and revised where necessary;

iii) The operating, maintenance, radiological surveillance, inspection and testing activities of radioactive waste management facilities are performed in accordance with established procedures. In the case of radioactive waste disposal facilities, the results obtained shall be used to verify and examine the validity of the assumptions made and to update the assessments, as specified in article 15, for the period following closure;

iv) The availability of the necessary engineering and technical support services in all disciplines relating to safety throughout the operating lifetime of radioactive waste management facilities;

v) The application of procedures for the characterisation and segregation of radioactive wastes;

vi) The licensee of the corresponding licence shall promptly notify the regulatory body of safety significant incidents;

vii) Programmes are established to compile and analyse the pertinent operating experience and actions are taken on the basis of the results where appropriate;

viii) Plans are prepared and updated where necessary for the decommissioning of radioactive waste management facilities, other than final disposal facilities, using the information obtained during the operating lifetime of the facility, and the regulatory body examines these plans;

ix) Plans are prepared and updated where necessary for the decommissioning of final disposal facilities, , using the information obtained during the operating lifetime of the facility, and the regulatory body examines these plans.

16.1. Waste management at nuclear and radioactive facilities

16.1.1. Operating permit: limits and conditions. Operating experience

As was indicated in the third National Report, the 2008 revision of the RNRF establishes the limits and conditions for awarding of the operating permit, discriminating the different categories of radioactive facilities and nuclear facilities. It was also indicated that the RNRF required that the safety analysis to be submitted in support of requests for operating permits for nuclear facilities include an operational environmental radiological surveillance programme, operating regulation, operating technical specifications and quality assurance manual.

The licensee is required to submit a series of reports and documentation for the regulatory control of his activities, in accordance with the provisions of the RNRF and with the limits and conditions established in the annex to the operating permit. These reports are different for nuclear and radioactive facilities.

As regards the Operating Regulation, the Third National Report detailed what is established in the RNRF, requiring that the document included in the request for the operating permit or its renewal contain information referring to job posts entailing nuclear responsibility and the organisation and functions of the personnel attached to the facility, defining the basic initial and on-going training programmes.

The organisation of all nuclear facilities is very 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 the nuclear facilities in all cases.

16.1.2. Characterisation and segregation of wastes

In Spain, the management of LILW is based on the El Cabril facility. In accordance with the successive operating permits, ENRESA is authorised to dispose of conditioned LILW in the platform cells as long as 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 latter, making a distinction between radioactive and nuclear facilities.

- ✓ In the case of radioactive facilities, the producer is required to:
  1. Request the removal of his wastes on the basis of the existing agreement (type contract in force, approved by the Directorate General for Energy Policy and Mines),
  2. Optimise waste volumes (segregation at the point of origin),
  3. Estimate activity, and
  4. Facilitate subsequent management by adapting the way in which the wastes are presented for the foreseen treatment. These wastes 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 specifically checks for compliance with the acceptance criteria.

- ✓ In the case of nuclear facilities, the operating and waste management procedures of each installation include waste segregation, conditioning and temporary storage activities and the methods to be used to minimise waste production.

  The methodology for the acceptance of LILW produced by the 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 wastes and the waste package production processes. Compliance with the acceptance criteria will be specifically checked by ENRESA. In this respect, 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 comply with the acceptance criteria, for which it applies to the different types of packages generated at the nuclear facilities a quality methodology and criteria previously authorised by the regulatory authorities.

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 installations of the nuclear facility aimed at determining the properties and characteristics of the type package and compliance in both cases with the acceptance criteria in force. Following approval, the resulting production of waste

packages will also be subject to production controls tests and, subsequently, to the technical verification tests performed at the laboratory of the El Cabril facility.

As regards VLLW, the major difference that exists with respect to the acceptance criteria for LILW is the introduction of the concept of the batch, DU-VLLW assembly, the characteristics and origins of which allow for an accurate description, such that they may be the subject of a single acceptance procedure. Each DU-VLLW batch corresponds to a batch of VLLW packages, these being identical when no further treatment is foreseen at the El Cabril disposal facility.

In order for a VLLW stream to be accepted, the producer will prepare a mainly descriptive declaration of the ways in which the waste package has been prepared, its components and control, included in a document describing the very low level waste package (LPD). 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 type packages and that have the corresponding acceptance documents approved.

Once the waste packages have been generated, they are studied in order to put together an acceptable batch. The main limitations established for the grouping of the packages are as follows:

- ✓ Wastes requiring additional treatment at the El Cabril disposal facility cannot be included in the same batch as wastes not requiring such treatment.
- ✓ Inert, non-hazardous wastes cannot be included with hazardous wastes. Verification of compliance with the acceptance criteria by the VLLW packages batch and DU-VLLW batch is accomplished by means of a VLLW batch Acceptance Dossier.

This Dossier contains or makes reference to sufficient information for analysis or justification of compliance with the requirements of the acceptance criteria and other applicable specifications for each package and for the batch formed by the group, and in turn documents the checks of compliance with the limits and applicable requirements for the DU batch and for each of the above.

16.1.3. Reporting of events

The 3rd National Report indicated the requirements of the RNRF vis-à-vis the information to be provided by the Licensee to the responsible authorities on any event implying an alteration in the normal operation of the facility or potentially affecting nuclear safety or radiological protection. Furthermore, Law 33/2007, which reformed Law 15/1980 creating the Nuclear Safety Council, and the RNRF itself, also establishes that the workers at nuclear and radioactive facilities shall be obliged to report any event that might affect the safe operation of such facilities, protecting them against possible reprisals.

With a view to orienting the licensees of nuclear power plants regarding the events to be reported to the Nuclear Safety Council, in July 2006 the CSN issued Council Instruction IS-10, which establishes the criteria for the reporting of events to the CSN by the nuclear power plants. This Instruction establishes the reporting criteria and includes reportable events, specifying the maximum time for the notification of each to the Nuclear Safety Council.

Furthermore, in compliance with the RNRF, the nuclear facilities have a Site Emergency Plan that includes the measures contemplated by the licensee and the assignment of responsibilities to respond to accident conditions, the objective being to mitigate their consequences, protect the personnel of the facility and immediately notify the competent authorities of their occurrence, including an initial assessment of the circumstances and of 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 October 9th 1992. The current operating permit, approved by Ministerial Order on October 5th 2001, will remain valid until such time as the available disposal volume of the existing cells is saturated. Furthermore, the resolution issued on July 21st 2008 by the Directorate General for Energy Policy and Mines authorised a design modification of the facility, as a result of which the definitive disposal cells are the 28 original cells for low and intermediate level wastes and four cells for very low level wastes, one of which has already been constructed. As established therein, ENRESA is required to carry out safety reviews every 10 years.

As was pointed out in detail in the Third National Report, 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 are added the disposal unit acceptance criteria. The limits and conditions on nuclear safety and radiological protection establish that operation of the facility shall be carried out in accordance with the corresponding revision of these documents.

The Operating Specifications describe the general conditions of operation of the El Cabril disposal facility. Part of these conditions are the limit values of certain parameters relating to the radiological capacity of the facility, the characteristics of wastes acceptable at the installation for incorporation in containers to form disposal units, the properties of these units and the conditions imposed on effluent releases during the operating phase. The following is also indicated:

1. The actions to be taken in circumstances implying 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 important for safety and radiological protection are subjected.

Each of the individual treatment and conditioning activities is described in internal documents known as Operating Instructions (OI's), which include all the activities covered by the 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 action for each of the systems of the facility, both those relating to waste management and the auxiliary systems.

On the basis of the data obtained from operating experience and maintenance, the organisations involved in the design of the facility and in these activities hold periodic meetings to draw up the improvement plans. The improvement actions associated with design modifications to the facility or its official documentation are regulated in a procedure known as the "Design modifications procedure", which establishes each of the aspects involved in this process.

16.2.2. Operating, maintenance, radiological surveillance, inspection and testing procedures

The October 2001 operating permit for the El Cabril disposal facility contemplates the possibility of the MITYC requiring the implementation of corrective actions in view of the experience acquired from operation of the installation, from the results of other on-going assessments and analyses and from the results of inspections and audits. During 2010, the CSN performed 10 inspections at the El Cabril facility.

Furthermore, both this authorisation and the design modification authorisation referred to above establish the obligation to submit reports on the following aspects, among others to the CSN, and depending on the report to the Directorate General for Energy Policy and Mines, during the first quarter of each calendar year: design modifications implemented or in the course of implementation, results of the environmental radiological surveillance programme and personnel dosimetry controls and measures taken to analyse the applicability of new national nuclear safety and radiological protection requirements and of the standards generated in this area in countries having disposal facilities of similar design. In this last case, aspects relating to tests and checks contributing to improving the understanding of the long-term behaviour of radioactive wastes are considered relevant.

Of the design modifications carried out during the period 2008-2010, the following may be considered especially significant:

- ✓ Start-up of the complementary VLLW disposal facility for the segregated disposal of this sub-category of wastes, including construction of the first disposal unit and start-up of the "technology building" for reception and conditioning prior to disposal of the waste units.
- ✓ Start-up of the control systems associated with the processes of the Main Control Room of the El Cabril LILW disposal facility, and distribution of the control room itself, with the objective of improving integration of the systems and their technological updating.
- ✓ Licensing of disposal unit CE-2b, designed with a view to optimising the capacity of the low and intermediate level cells for the disposal of wastes from the dismantling of large metallic parts (steam generators, reactor vessel heads, etc.), which requires a container different from the currently existing CE-2a. This new container has the same length and width of the CE-2a and half the height, maintaining the same technical requirements as the latter.
- ✓ Technological renovation of the measuring and control equipment integrated in the radiation monitoring system, maintaining the original technical requirements. The renovation includes changing the area monitors and replacing the environmental contamination and effluents monitors and the samplers.
- ✓ Renovation of the fire protection system of the buildings associated with the reception, transfer, treatment and conditioning and temporary storage of wastes.

16.2.3. Engineering and technical support services

In accordance with the provisions of the RNRF, the Operating Regulation contains information on the rundown of job posts with nuclear responsibility and the organisation and functions of the personnel attached to the facility, defining the basic initial and on-going training programmes.

In relation to the Third National Report, the modifications that have taken place during the period in this area refer to the operating organisation, which is based on different organisational units reporting to the Management of the Centre, with the Director currently reporting to the Technical Division of ENRESA, as shown in the organisational flowchart included in Annex F of this report. In turn, general technical support is provided to the facility from the company headquarters via the Safety and Licensing and LILW Engineering Departments of the Waste and Fuel 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 performance and review of both the design and the technical va-

lidity of the 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 criteria for the acceptance of wastes at the facility should be approved by the regulatory authorities, due their constituting 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.

In December 2001, on completion of a characterisation campaign on the CE-2a container performed in accordance with the French Fundamental Safety Rule RFS-III.2, ENRESA submitted to the CSN a request for authorisation of a modification with revised acceptance criteria. These proposed that the criteria be applied to the disposal units, thus allowing credit to be given to the properties of the container, leaving the acceptance criteria for primary waste packages as the specification guaranteeing their quality, as agreed on between ENRESA and the producers.

In December 2004 the regulatory authorities approved this modification, this allowing the characteristics of the CE-2a container to be used in the study of certain historic and non-conforming primary waste packages (non-compliance with the quality objectives in relation to mechanical resistance, confinement or resistance to thermal cycles). This has allowed for the following:

- ✓ Increase in the activity limit per primary waste package.
- ✓ Increase in the dose rate limit acceptable 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, in which respect mention should be made of the authorisation for the manufacturing and use of "cage" type disposal units for the arrangement in cells of primary waste packages having unique characteristics, in metallic structures with a geometry identical to that of the aforementioned CE-2a container and, more recently, the design and licensing of the CE-2b disposal unit[1] specifically designed to better meet the needs associated with the management of solid wastes generated during dismantling activities.

ENRESA also currently possesses an acceptance methodology for primary waste packages from nuclear facilities, compliance with which is part of the Operating Technical Specifications of the El Cabril disposal facility.

The management of wastes at the El Cabril disposal facility is designed to allow for the identification, tracking and control of all the waste packages at the facility and the updating of the inventory of activity stored in the cells, such that it may be contrasted at all times with the maximum radiological capacity (reference inventory).

ENRESA is authorised to perform necessary LILW tests and checks for characterisation and acceptance. The acceptance process controls are mainly process audits, production controls and destructive and non-destructive technical verification tests, performed mainly at the laboratory of the El Cabril disposal facility. The objectives of these tests are as follows:

- ✓ Checking of activity values against those declared by the producer and tracking of scale factors for difficult to measure radionuclides.

[1] *See 16.2.2 design modifications.*

- ✓ Compliance with the waste package properties associated with the generation methodology.
- ✓ Checking of chemical aspects of importance for safety in disposal (compatibility with the container, corrosion, etc.).
- ✓ Compliance with the quality-related objectives of the conditioned wastes.

Since October 2008, ENRESA has operated a specific installation at the El Cabril Disposal Facility for the disposal of very low level radioactive wastes (VLLW), which may be defined as solid or solidified materials, for the most part chemically inert or previously stabilised, that are contaminated and/or activated and whose radioactive content presents an average activity lower than certain authorised limits.

As has been indicated previously[1], these wastes constitute a sub-category of low and intermediate level wastes and, in general, present specific activities of between 1 and 100 Bequerels per gram, possibly reaching several thousand in the case of certain radionuclides of low radiotoxicity or of minor quantities.

16.2.5. Reporting of events

The El Cabril facility has a Site Emergency Plan. Emergency situations are classified in three categories, none of which contemplate the release of radioactive materials in a quantity such that it be necessary to adopt off-site protective measures. Consequently, no level of emergency of a degree of seriousness higher than the Site Emergency is defined.

In addition to the organisation for normal conditions, the Site Emergency Plan includes the activities and organisation for the operation of the facility in emergency situations requiring actions beyond the normal activities carried out. The basis of the emergency organisation is the operating organisation itself, although mechanisms have been established to guarantee the location of one of these persons at all times, in accordance with an internal procedure. Reporting to the CSN is contemplated in all cases.

Furthermore, El Cabril, like all other nuclear facilities, is subject to the reporting of events in application of the standards in force.

Article 17
Institutional measures following closure

Article. 17. Institutional measures following closure.

Each Contracting Party shall adopt adequate measures to ensure that following the closure of a facility for the definitive disposal of radioactive wastes:

- *i) The records on the location, design and inventory of the facility required by the regulatory body are preserved;*
- *ii) Active or passive institutional controls are applied, such as radiological surveillance measures or restrictions on access, where necessary, and*
- *iii) If during any period of institutional control a non-scheduled emission of radioactive materials to the environment is detected, intervention measures are applied where necessary.*

[1] See Section B.2 Radioactive waste classification.

To date only one facility in which radioactive wastes remain in storage or deposit has been decommissioned. Adequate measures have been taken to ensure compliance at this installation with the provisions of article 17. Likewise, those facilities that are in the same circumstances and whose decommissioning is planned in the more or less short term are also expected to fulfil the requirements of the said article.

17.1. Custody of documents

In accordance with R.D. 1349/2003, on the ordering of ENRESA's activities and their financing, this public company shall be responsible for permanently maintaining an archive of the inventory of wastes deposited at disposal facilities or of radioactive waste repositories. This custody shall apply even in the case of the facility in question having been decommissioned or closed.

17.2. Period of compliance following closure

The Regulation on Nuclear and Radioactive Facilities (RNRF) constitutes the reference regulatory framework for the dismantling and decommissioning of nuclear and radioactive facilities and, for the purposes of regulation and control, places first category radioactive facilities involved in the nuclear fuel cycle alongside nuclear facilities (Art. 37 RNRF).

In Spain, all the installations that have been decommissioned or are in the dismantling phase and that maintain conditioned and stabilised waste materials on their former site belong to the front end of the nuclear fuel cycle (mining tailings and process tailings from former uranium mills). Some of these facilities (storage installations or repositories) are currently in the so-called period of compliance, pending the declaration of decommissioning of the facility. Another is in the dismantling phase and, finally, one has obtained its declaration of decommissioning (for more information, refer to Section D of this report – inventories and lists).

The period of compliance is a period prior to the declaration of decommissioning and allows for verification in the short term of the suitability of the waste conditioning performed and of the different engineered barriers implemented. During this period, the installation remains under the responsibility of the licensee and is subject to habitual regulatory control.

The aforementioned regulation establishes that the process of dismantling of these installations should conclude with a declaration of decommissioning, freeing the licensees from their responsibilities as operators (Art. 12 f RNRF).

17.3. Institutional controls and future forecasts

The institutional controls imposed to restrict the use of sites at which stabilised radioactive wastes arising from the former facility remain in situ shall be contemplated specifically in the declaration of decommissioning issued (article 12 f RNRF).

The declaration of decommissioning shall define the limitations on use applicable to the site, as well as the entity or organisation responsible for the maintenance of such limitations and for monitoring compliance with them (Art. 12 f RNRF).

Section h) of article 2 of Royal Decree 1349/2003, on the ordering of ENRESA's activities and their financing, establishes that one of the functions of the company is to ensure the long-term management of all facilities serving for the storage or disposal of wastes.

Section g) of article 2 of Law 15/1980 creating the CSN, in accordance with the wording of reforming Law 33/2007, attributes to this organisation the function of controlling and monitoring the radiological quality of the environment throughout the entire national territory, in compliance with the international obligations of the Spanish State in this area, and without prejudice to the competences attributed to the different public administrations.

Act 11/2009, in its ninth final provision, establishes a new article 38 bis in the Act on Nuclear Energy (Act 25/1964) the mandate of which is that the State will take title of radioactive wastes once they have been disposed of. The State will also carry out the institutional control, if required, of a nuclear facility after its closure and after the period of time set up in the corresponding closure statement has gone by.

The institutional controls that will be required in future declarations of decommissioning are not yet defined from the point of view of the organisations responsible for long-term control. It is expected that shared responsibilities will be assigned depending on the different objectives of the institutional controls imposed (physical protection, documentary records, etc.). To date, the only facility decommissioned that still has waste materials stored on site is the Lobo-G plant. In its declaration of decommissioning it is stated that until such time as the institutional party responsible for surveillance and control is named, the former licensee shall continue to be responsible.

As regards fuel cycle facilities decommissioned and without any restrictions of a radiological nature, and logically without radioactive wastes stored or deposited on site, the only institutional requirement established in their declarations of decommissioning is that the licensee maintains all documentation referring to the facility for at least five years. This includes information on both the operating lifetime of the facility and on dismantling activities.

17.4. Forecasts regarding possible remedial interventions

The possible remedial interventions at decommissioned facilities with radioactive waste stored or deposited on site should be contemplated in the declarations of decommissioning 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 decommissioning declarations to those entities or organisations appointed as responsible for long-term control.

Section I

Transboundary movements

Section I. Transboundary movements

Article 27
Transboundary movements

Article 27: Transboundary movements

1. *Each Contracting Party intervening in cross-border movements shall adopt adequate measures to ensure that such movements are carried out in a manner compatible with the provisions of this Convention and pertinent binding international instruments. For this purpose:*

   i) A Contracting Party being the State of Origin shall adopt appropriate measures to ensure that the cross-border movement is authorised and takes place only with notification to and the consent of the State of destination;

   ii) Cross-border movements through States of transit shall be subject to the international obligations relating to the specific modes of transport used;

   iii) A Contracting Party being the State of destination shall consent to cross-border movements only if it possesses the administrative and technical capacity and the regulatory structure required to manage the spent fuel or radioactive wastes in a manner compatible with this Convention;

   iv) A Contracting Party being the State of origin shall authorise cross-border movements only if it is able to verify that, in accordance with the consent of the State of destination, the requirements of section iii) are fulfilled prior to the said cross-border movement;

   v) If a cross-border movement is not carried out or cannot be carried out in accordance with the present article, the Contracting Party being the State of origin shall adopt adequate measures to allow for readmission into its territory, unless a safe alternative arrangement can be made.

2. *The Contracting Parties shall not issue licences for the shipment of their spent fuel or radioactive wastes to destinations located south of latitude 60 degrees South for their storage or disposal.*

3. *None of the provisions of this Convention shall prejudge or affect:*

   i) The exercising of the rights and liberties to maritime, inland waterway and aerial navigation that under international Law corresponds to the vessels and aircraft of all States.

   ii) The rights of a Contracting Party to which radioactive wastes are exported for reprocessing to return or make arrangements to return such

radioactive wastes and other products to the State of origin following processing;

iii) The right of a Contracting Party to export its spent fuel for reprocessing;

iv) The rights of a Contracting Party to which spent fuel is exported for reprocessing to return or make arrangements to return such radioactive wastes and other products deriving from reprocessing activities.

27.1. Legal development

As was described in the third national report, Council Directive 2006/117/EURATOM, of November 20th 2006, establishes the community system for the surveillance and control of transboundary transfers of radioactive waste and spent fuel. This Directive has been transposed to the national legal system by means of Royal Decree 243/2009, of February 27th, regulating the surveillance and control of transfers of radioactive wastes and spent nuclear fuel between member States or shipped to or from countries outside the Community, the most important novelties of which have been described in section 19.2 of this report. The said Royal Decree annuls previous Royal Decree 2088/1994, of October 20th, by means of which Council Directive 92/3/EURATOM was incorporated into the Spanish legal system, the latter having been replaced by the aforementioned Directive 2006/117/EURATOM.

Likewise, the Royal Decree establishes the uniform document format defined in Commission Decision 2008/312/Euratom, of March 5th, which must be completed in the case of a request for transfer.

Royal Decree 243/2009 is not applicable to transfers of disused sources to a manufacturer or supplier of radioactive sources or to a recognised facility, to transfers of radioactive materials recovered by reprocessing for use or to the transboundary shipment of wastes containing only natural radioactive material not resulting from practices, in accordance with the definition provided by Royal Decree 783/2001, of July 6th.

The authorisation contemplated in this Royal Decree do not replace any of the specific national requirements applicable to these transfers, such as those relating to specific authorisations for shipment, physical protection, civil defence, etc.

Furthermore, as has been pointed out in previous reports, Spain has included in its internal standards a series of international updates and amendments referring to the transport of hazardous goods by air, sea, rail and road, specifically those referring to the following:

- ✓ European Agreement on the International Transport of Hazardous Goods by Road (ADR) 2011. The 2009 edition of the ADR was published in the Official State Gazette (BOE) on July 29th 2009 (correction of errors published in the BOE on March 19th 2010). The 2009 ADR entered into force exclusively on July 1st 2009, and since January 1st 2011 a new version has been in force (ADR 2011), although until June 30th 2011 shipments will also be allowed in accordance with ADR 2009. This latest amendment, by which annexes A and B of the ADR have been modified, is pending publication in the BOE.
- ✓ Regulation on the International Transport of Hazardous Goods by Rail (RID) 2009. The amendments introduced through the 2009 edition of the RID were published in the BOE on August 14th 2009.
- ✓ International Maritime Code on Hazardous Goods (IMDG Code) 2006, published in the BOE on November 12th 2008.

- ✓ Technical Instructions for the Air Transport without risk of Hazardous Goods (OACI) 2006.

In addition, and as commented in the third national report, Royal Decree 551/2006, of May 5th 2006, regulates the transport of hazardous goods by road within the Spanish territory.

27.2. Spanish experience

The Spanish experience of transboundary movements during the period considered has consisted of transfers of low and intermediate level radioactive wastes, with Spain being the destination. Specifically, radioactive wastes from the inspection and decontamination of the hydraulic circuit of reactor coolant pump circuits and four motors at Spanish nuclear power plants have been received. One such shipment has already been carried out applying the procedure established in Royal Decree 243/2009.

Furthermore, in 2009, 3 shipments of irradiated fuel rods were sent from the Almaraz and Vandellós II nuclear power plants to the hot cell laboratories of CEA (France) and Studsvik (Sweden), within the framework of a research programme aimed at the study of various properties of cladding materials. These transport operations were carried out in compliance with all the obligations established in the national and international standards on the transport of hazardous goods and the physical protection of nuclear materials.

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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, within the framework of its national legislation, adopt adequate measures to ensure that the possession, re-elaboration or final disposal of disused sealed sources take place in a safe manner.*
2. *The Contracting Parties shall allow disused sealed sources to re-enter their territory if, within the framework of their national laws, they have accepted the return of such sources to a manufacturer authorised to receive and possess disused sealed sources.*

28.1. Measures to ensure safe possession, re-elaboration or disposal

Article 31 of the Nuclear Energy Act, Law 25/1964, establishes that radioactive materials may not be used or stored within the national territory by persons not expressly authorised to do so, and indicates that the same requirements shall be demanded for transfer or resale.

This legal requirement is developed in the Regulation on Nuclear and Radioactive Facilities (RNRF). Article 36 of this regulation establishes that radioactive facilities having scientific, medical, agricultural, commercial or industrial purposes shall require an operating permit, a declaration of decommissioning and, where appropriate, an authorisation for modification and change of ownership.

Article 34 of the aforementioned regulation provides that radioactive facilities shall be those installations of any type that contain a source of ionising radiations, along with those premises, laboratories, factories and installations at which radioactive materials are produced, used, possessed, treated, handled or stored. Article 35 of the RNRF establishes that installations meeting certain conditions described therein shall not be considered radioactive facilities, defining levels of exemption based on isotopic activity and isotopic activity per unit of mass.

Likewise, the RNRF establishes the conditions for exemption from classification as radioactive facilities applicable to certain apparatus (consumer goods) incorporating radioactive substances or generating ionising radiations. In this case the Regulation establishes a system for the approval of types of radioactive apparatus by the Ministry of Industry, Tourism and Trade, following a report by the Nuclear Safety Council, in which the conditions for their disposal shall be established.

These requirements are applicable regardless of whether the radioactive sources or materials are new or are depleted or out of use.

Consequently, in Spain the possession or re-elaboration of any radioactive source or material requires that an administrative authorisation be obtained. Within the licensing process to be adhered to by the licensee in order to obtain such authorisation, it is necessary for the CSN to issue a mandatory report on safety and radiological protection after having verified that the licensee will perform all the operations in compliance with the applicable safety and radiological protection standards and requirements. The corresponding authorisations, issued by the competent authorities, are accompanied by applicable limits and conditions relating to safety and radiological protection.

Among the documentation to be submitted by the licensees to obtain these authorisations is a document on forecasts for the decommissioning of the facility, in which they are required to report on forecasts for the safe management of disused sources, including the economic coverage foreseen for this purpose.

Whenever it encounters situations of radioactive sources or equipment no longer in use, the Spanish Regulatory Body, in application of its functions regarding the inspection and control of authorised facilities, urges the licensees to have such sources or equipment removed via the channels contemplated in the regulations and supervises the performance of these activities.

As regards the final disposal of disused radioactive sources, the provisions adopted in Spain are diverse and depend on the different situations that might arise.

In the case of radioactive sources for which the licensee has obtained authorisation as a radioactive facility, entitling him to possess and use such items in accordance with the safety and radiological protection limits and conditions accompanying such authorisation, the licensee is obliged to return the disused radioactive sources to the supplier or, if this were not possible, to have them managed by the Empresa Nacional de Residuos Radiactivos (ENRESA).

In Spain there are no facilities for the manufacturing or production of sealed radioactive sources, as a result of which all sources are imported from other countries. The importing of radioactive sources is also subject to a system of authorisation in accordance with article 74 of the RNRF, which indicates that the importing, exporting and intra-community movement of radioactive materials shall be carried out in compliance with the international commitments made by Spain in this respect. When the sources come from a European Union member country, a system of notification of transfers to the authorities of the receiving country and acceptance by them, as established in Regulation 1493/1993/EURATOM, is applied. In the case of sources having their origin or destination in countries outside the European Union, the Code of Conduct on the Technological and Physical Security of Radiation Sources is applicable, more specifically the supplementary guide on the Importing and Exporting of Radioactive Sources. This guide contemplates a system of prior consent by the Regulatory Authority of the importing country for the shipment of any category one source, along with notification prior to the date of dispatch. For category two sources, only notification prior to the effective date of dispatch is required. In Spain, the Nuclear Safety Council has been appointed as the point of contact for communications deriving from the application of this guide.

When the entity that is going to import radioactive sources is authorised as a radioactive facility, the authorisation also entitles it to undertake such imports (single authorisation). The limits and conditions that accompany such authorisations establish the obligation for all entities importing radioactive sources from other countries to draw up agreements with the overseas suppliers for the return of these sources to the country of origin at the end of their service lifetime.

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 service lifetime (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 for the latter to undertake removal and management as a radioactive waste. In such cases, ENRESA, on the basis of the standards regulating its activity, 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), in other words when there is no licensee authorised to possess them, the two aforementioned possibilities are also contemplated. If it possible to identify the supplier of the source, the person in possession of it makes the arrangements necessary for it to be removed; if this is not feasible, the owner of the source contacts ENRESA. In accordance with article 74 of the Regulation on Nuclear and Radioactive Facilities, the removal by ENRESA of unauthorised disused sources requires a specific authorisation for transfer issued by the Ministry of Industry, Tourism and Trade, following a report by the CSN.

Between 2007 and 2009, a campaign was performed for the detection and recovery of orphan sources (not subject to regulatory control), with positive results. Almost 300 radioactive sources were received, the majority of little radiological significance.

A special case in relation to orphan sources is that of sources detected at metallic scrap processing or recovery facilities. The actions to be taken to ensure the safe management of such sources are contemplated in a Protocol subscribed by the companies in this sector, the Ministry of Economy, the CSN, ENRESA and the trade union organisations. This protocol establishes that the licensee of the industry in which the source is detected shall be obliged to set up technical and administrative systems to isolate the source, identify the radioactive isotope in question and its activity and keep it under safe conditions pending removal. This protocol establishes that when the radioactive source is of national origin it will be managed as a radioactive waste by ENRESA, the latter accepting the costs. In other cases, the sources shall be returned to the supplier of the scrap or, if this were not feasible, shall be transferred to ENRESA for management as radioactive waste, in which case the cost shall be to the companies, without prejudice to their possible passing it on to the supplier or shipper of the scrap.

Another special case is that of the needles of Ra-226 for medical use that were utilised in Spain before the developments of the standards 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 such management have been applied to the ENRESA fund, with no cost for the holders. At present very few batches of needles of Ra-226 continue to appear; when they do, they are managed as indicated above.

The safe possession, use, transfer and final disposal of radioactive sources in all the cases dealt with in the previous paragraphs are guaranteed, since the different entities participating in these processes are obliged to fulfil the requirements of the Regulation on Protection of Health against Ionising Radiations. This Spanish standard includes requirements on safety and radiological protection equivalent to those contained in the International Standards on Radiological Protection and the Safety of Radiation Sources of the International Atomic Energy Agency (IAEA) and in the 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 sources and orphan sources. This directive has been transposed to the Spanish national standards by Royal Decree 229/2006, of February 24th, on the control of high activity encapsulated radioactive sources and orphan sources. This new stan-

dard includes specific requirements on the control of sources and the management of disused sources.

Article 5 indicates that, before completing the arrangements for authorisation prior to the start-up of a radioactive facility whose authorisation includes a source, the possessors of sources should reach appropriate agreements with the supplier for the return of the source when it becomes a disused source and establish a financial guarantee to cover safe management at that time, even in the event of insolvency, interruption of business or any other contingency possibly affecting the owner of such sources.

Article 7 of this same standard establishes the obligation of owners of sources to keep a sheet with an inventory of each of the sources under their responsibility, including their location and transfers, and to send a copy to the Nuclear Safety Council and the Ministry of Industry, Tourism and Trade. They are also required to provide a copy of this sheet specifically in the event of any change in location or, where appropriate, in the habitual storage of the source. Likewise, on closure of the inventory sheet of a given source, they shall immediately communicate the identification of the new owner or of the recognised facility to which the source is transferred.

As an additional measure this article requires the Nuclear Safety Council to maintain an updated national inventory of authorised owners and of the sources they possess.

Article 8 of this standard requires the owner to return any disused sources to the supplier, for which the appropriate agreements should be reached previously, or to transfer such sources to another authorised owner or to a recognised facility without unjustified delay once they have ceased to be used.

Finally, this new standard includes requirements relating to the identification and marking of sources, personnel training and surveillance measures to detect the appearance 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 apply the Code of Conduct for the Technological Safety and Security of Radiation Sources, this in fact reinforcing the measures applied to maintain efficient control over radiation sources from manufacturing to final disposal at an authorised facility. These measures are included in the national regulations on safety, radiological protection, radioactive waste management, transport and the control of radioactive sources.

As has been pointed out, Spain is also applying the Guide on the importing and exporting of radioactive sources published by the IAEA in development of the aforementioned Code of Conduct and has appointed a national point of contact for the exchange of requests for permission to transfer sources and of notifications of their shipment.

28.2. Readmission into Spain of disused sealed sources

As has been pointed out above, at present there are no facilities in Spain for the manufacturing or production of sealed radioactive sources. Nevertheless, there is no provision in the Spanish standards that prevents the readmission into the country 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, accepting the return of disused sources to suppliers or manufacturers authorised in their national territory.

Section K

Activities planned to improve safety

Section K. Activities planned to improve safety

This Fourth National Report has described the situation existing in Spain in relation to the management of spent fuel and radioactive wastes within the context of the requirements established in the Joint Convention. In view of the information provided in dealing with each article and of the assessment of compliance, it may generally be stated that the Spanish system continues to fulfil the requirements of the Convention.

Nevertheless, taking into account the very nature of the safe management of radioactive wastes and spent fuel, work continues on improving the legal and regulatory framework and in the areas indicated below, in which improvements are expected to be achieved in the short and medium term.

K.1.
Legal developments in relation to safety in the management of spent fuel and radioactive wastes

As has been pointed out throughout this report, the areas in which efforts will continue with a view to completing the legal and regulatory framework regarding the long-term management of spent fuel and radioactive waste are as follows:

New Royal Decree on the Physical Protection of facilities, nuclear materials and radioactive sources

The commitments accepted by Spain in this area (Resolution 1540 of 2004, of the United Nations Security Council, Global Initiative to Combat Nuclear Terrorism, Code of Conduct on the technological safety and security of radioactive sources…), particularly as regards what is set out in the Amendment to the Convention on the physical protection of nuclear materials, which imposes upon the Member States the obligation to adopt legislative, regulatory or administrative measures for compliance with the obligations of the Convention, make it advisable to establish a new Royal Decree having the following among its most relevant objectives:

- ✓ Enhancement of the physical protection measures applied to the facilities, nuclear materials and most relevant radioactive sources.
- ✓ Revision of the system of authorisations in force, contemplating separately those corresponding to facilities and those relating to the transport of nuclear material.

- ✓ The establishment of a system of physical protection at facilities using radioactive sources, specifying in which cases it is obligatory to have a specific system of physical protection for transport.
- ✓ More specific mapping out of the basic obligations of the licensees of physical protection authorisations, as regards both the control and protection of materials, facilities and shipments subject to regulation and the criteria for the security classification of the facility and transport personnel.
- ✓ Strengthening of the measures for the control and supervision of companies participating in the transport of nuclear and radioactive materials.
- ✓ Coordination of the competent authorities and prevention of events relating to the illicit trafficking of nuclear and radioactive materials, establishing a point of contact with the IAEA Illicit Trafficking Database.

The Regulation on nuclear and radioactive facilities (RNRF) has not undergone any significant modification since the approval of Royal Decree 35/2008, which was described in detail in the third report. However, a modification to the system of authorisations is currently under way to take into account the new Royal Decree on Physical Protection.

K.2. Construction of a Centralised Temporary Storage (CTS) facility

As has already been pointed out in article 6, as of the date of closure of the report the last step in the site selection procedure remained pending, this consisting of designation by the Government of the definitive site for the facility, following which it will be possible to begin the process of licensing the installation.

K.3. Measures deriving from the recommendations of the IAEA IRRS mission

One of the suggestions made by the IRRS Mission that took place in Spain in early 2008, in relation to the national infrastructure for radioactive waste management, was that there be collaboration with the competent authorities in the drawing up and maintenance of a national inventory of existing and anticipated radioactive wastes, including those wastes that might be generated outside regulated facilities.

As part of the Action Plan designed to implement the improvements deriving from the international review, a mixed CSN-MITYC-ENRESA working group was set up following the mission to draw up a proposal for improvement of the national inventory of radioactive wastes.

Finally, in the wake of the IRRS Follow-Up mission hosted by Spain in early 2011, the review team concluded that, in view of the activities carried out in Spain to identify and characterise waste categories and of the progress made by the mixed working group, this suggestion might be closed.

K.4. Safety implications deriving from the Fukushima accident

In the light of the Fukushima accident and of its consequences, and on the basis of the analyses carried out subsequent to it, various national and international initiatives aimed at re-assessing the safety standards applicable to nuclear facilities have emerged. In this respect, Spain will continue to participate actively in the efforts being made at the level of the IAEA, the European Union, the nuclear regulatory forums, bilateral technical cooperation and nationally in safety review and analysis of the risks identified at such facilities following the Fukushima accident, with a view to addressing possible safety improvements. Within the framework of this convention, special relevance will be attached to safety in spent fuel disposal and the safety of nuclear facilities in general.

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Section L

Annexes

Section L. Annexes

ANNEX A

INTERNAL LEGAL STANDARDS IN THE AREA OF NUCLEAR ENERGY AND RADIOACTIVE WASTES

1. STANDARDS OF LEGAL STANDING

- ✓ Nuclear Energy Act (Law 25/1964 of April 29th; NEA; Official State Gazette 04.05.1964). This law has been modified by the following:
  - ➪ Law 25/1968, of June 20th, modifying articles 9 and 16 of Law 25/1964.
  - ➪ Law 15/1980, of April 22nd, creating the Nuclear Safety Council.
  - ➪ Electricity Industry Act, Law 54/1997, of November 27th. (Art. 2.9)
  - ➪ Law 62/2003, of December 30th, on fiscal, administrative and social order measures (addition of art. 2.12 b) and first additional provision)..
  - ➪ Law 24/2005, of November 18th, on reforms to promote productivity (arts. 28-30, 84)
  - ➪ Law 33/2007, of November 7th, reforming Law 15/1980 (arts. 1, 2.12 b), 36-38, 43, 44 b) and chapter XIV).
  - ➪ Law 11/2009, of October 26th, regulating Quoted Limited Real-Estate Investment Companies (art. 38 b).
  - ➪ Law 12/2011, of May 27th, on civil liability for nuclear damage or damage caused by radioactive materials (arts. 2 and 28) (annuls chapter VII (except art. 45) and chapters VIII, IX and X).
- ✓ Law creating the Nuclear Safety Council (Law 15/1980, of April 22nd; Official State Gazette 25.04.1980). This law has been modified by the following:
  - ➪ Hydrocarbon Sector Act, Law 34/1998, of October 7th.
  - ➪ Law 14/1999, of May 4th, on tariffs and public prices for services rendered by the CSN.
  - ➪ Law 62/2003, of December 30th, on fiscal, administrative and social order measures.
  - ➪ Law 24/2005, of November 18th, on reforms to promote productivity.
  - ➪ Law 33/2007, of November 7th, reforming Law 15/1980.
- ✓ Law on tariffs and public prices for services rendered by the Nuclear Safety Council (Law 14/1999, of May 4th; Official State Gazette 05.05.1999)
- ✓ Electricity Industry Act (Law 54/1997, of November 27th; Official State Gazette 28.11.1997 and 31.12.2001). As regards nuclear energy, this law has been modified by the following:
  - ➪ Law 24/2005, of November 18th, on reforms to promote productivity (seventh additional provision).

- Law 11/2009, of October 26th, regulating Quoted Limited Real-Estate Investment Companies (sixth additional provision and annulment of sixth additional provision b)).

- Sustainable Economy Act, Law 2/2011, of March 4th, which modifies section 9 point four of the sixth additional provision of Law 54/1997, regulating the fee for the rendering of services for the management of radioactive wastes generated by radioactive facilities and other installations.

✓ Law 9/2006, of April 28th, on assessment of the effects of certain plans and programmes on the environment (Official State Gazette 29.04.2006). This law has been modified by the following:

- Royal Legislative Decree 1/2008, of January 11th, approving the reworded text of the Law on the assessment of the environmental impact of projects.

✓ Law 27/2006 (Aarhus Law), of July 18th, regulating rights to access information, public participation and justice in environmental matters. (Official State Gazette 19.07.2006). This law has been modified by the following:

- Royal Legislative Decree 1/2008, of January 11th, approving the reworded text of the Law on the assessment of the environmental impact of projects.

✓ Law 12/2006, of December 27th, on complementary fiscal items in the Budget of the Autonomous Community of Andalusia (Official State Gazette 16.01.2007)

✓ Law 11/2009, of October 26th, regulating Quoted Limited Real-Estate Investment Companies (Official State Gazette 27.10.2009).

✓ Law 12/2011, of May 27th, on civil liability for nuclear damage or damage caused by radioactive materials (Official State Gazette 28.05.2011).

2. Standards of regulatory standing

1. Regulation on Nuclear and Radioactive Facilities. (Royal Decree 1836/1999, of December 3rd; Official State Gazette 31.12.1999). This Regulation was modified by the following:

   - Royal Decree 35/2008, of January 18th, modifying the Regulation on Nuclear and Radioactive Facilities.

2. Regulation on the Protection of Health against Ionising Radiations. (Royal Decree 783/2001, of July 6th; Official State Gazette 26.06.2001). This Regulation has been modified by the following:

   - Royal Decree 1439/2010, of November 5th, modifying the Regulation on the protection of health against ionising radiations, approved by Royal Decree 783/2001, of July 6th (Official State Gazette 18.11.2010).

3. Royal Decree 1440/2010, of November 5th, approving the Charter of the Nuclear Safety Council (Official State Gazette 22.11.2010).

4. Royal Decree 229/2006, of February 24th, on the control of high activity encapsulated radioactive sources and orphan sources (Official State Gazette 28.02. 2006).
5. Royal Decree 775/2006, of June 23rd, creating the Interministerial Commission for the establishment of criteria to be met by the site of the centralised temporary storage facility for spent nuclear fuel and high level wastes, and associated technology centre (Official State Gazette 05.07.2006).
6. Royal Decree 413/1997, of March 21st, on the Radiological Protection of external workers running a risk of exposure to ionising radiations as a result of interventions in the controlled zone (Official State Gazette 16.04.1997).
7. Royal Decree 1132/1990, of September 14th, establishing fundamental measures for the radiological protection of persons subjected to medical examinations and treatments (Official State Gazette 18.09.1990).
8. Royal Decree 815/2001, of July 13th, on justification of the use of ionising radiations for the radiological protection of persons in the event of medical exposures (Official State Gazette 14.07.2001).
9. Royal Decree 1085/2009, of July 3rd, approving the Regulation on the installation and use of X-ray apparatus for the purpose of medical diagnosis (Official State Gazette 18.07.2009).
10. Royal Decree 158/1995, of February 3rd, on the Security of Nuclear Materials (Official State Gazette 04.03.1995).
11. Royal Decree 1464/1999, of September 17th, on activities in the front end of the nuclear fuel cycle (Official State Gazette 05.10.1999).
12. Royal Decree 1349/2003, of October 31st, on the ordering of the activities of the Empresa Nacional de Residuos Radiactivos, S. A. (ENRESA) and their financing (Official State Gazette 08.11.2003).
13. Royal Decree 1546/2004, of June 25th, approving the basic Nuclear Emergency Plan (PLABEN; Official State Gazette 14.07.2004). This Royal Decree has been modified by the following:
    - Royal Decree 1428/2009, of September 11th (Official State Gazette 12.09. 2009).
14. Regulation on the coverage of nuclear risk (Decree 2177/1967, of July 22nd; Official State Gazette 18.09.1967). This Regulation was modified by the following:
    - Decree 742/1968, of March 28th, modifying article 66 of the Regulation.
15. Regulation on the assessment of environmental impact (Royal Decree 1131/1988, of September 30th Official State Gazette 05.10.1998).
16. Royal Decree 208/2005, of February 25th, on electrical and electronic apparatus and waste management (Official State Gazette 26.02.2005).
17. Royal Decree 1428/1986, of June 30th, on radioactive lightning rods (Official State Gazette 11.07.1986). This Royal Decree was modified by the following:
    - Royal Decree 903/1987, of July 10th (Official State Gazette 11.07.1987).
18. Royal Decree 243/2009, of February 27th, regulating the surveillance and control of shipments of radioactive waste and spent nuclear fuel between member States or into and out of the Community (Official State Gazette 02.04.2009).
19. Royal Decree 551/2006, of May 5th, regulating the transport of hazardous goods by road in the Spanish territory (Official State Gazette 12.05.2006).

20. Royal Decree 412/2001, of April 20th, regulating various aspects relating to the transport of hazardous goods by rail (Official State Gazette 08.05.2001), modified by Ministerial Order on 1/02/2007.

21. Royal Decree 1749/1984, of August 1st, approving the National Regulation on the transport of hazardous goods by air (Official State Gazette 02.10.1984), modified by Ministerial Order on 28/12/1990.

22. Royal Decree 145/1989, of January 20th, approving the National Regulation on the admission, handling and storage of hazardous goods at ports (Official State Gazette 13/02/1989).

3. Council instructions

- ✓ Nuclear Safety Council Instruction IS-01, of May 31st 2001, defining the format and content of the individual radiological monitoring document (radiological passbook) regulated in Royal Decree 413/1997 (Official State Gazette 06.08. 2001)
- ✓ Nuclear Safety Council Instruction IS-02 revision 1, on the documentation of refuelling activities at light water reactor nuclear power plants (Official State Gazette 16.09. 2004). (translated into English).
- ✓ Nuclear Safety Council Instruction IS-03, of November 6th 2002, on qualifications to obtain recognition as an expert on protection against ionising radiations (Official State Gazette 12.12. 2002).
- ✓ Nuclear Safety Council Instruction IS-04, of February 5th 2003, regulating the transfer, filing and custody of documents corresponding to the radiological protection of the workers, public and the environment prior to the transfer of ownership of practices at nuclear power plants for dismantling and decommissioning (Official State Gazette 28.02. 2003).
- ✓ Nuclear Safety Council Instruction IS-05, of February 26th 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 April 9th 2003, defining the training programmes on basic and specific radiological protection regulated in Royal Decree 443/1997, of March 21st, in the area of nuclear facilities and fuel cycle radioactive facilities (Official State Gazette 03.06.2003). On October 28th 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 June 22nd 2005, on fields of application of personnel licences for radioactive facilities (Official State Gazette 20.07.2005).
- ✓ Nuclear Safety Council Instruction IS-08, of July 27th 2005, on the criteria applied by the Nuclear Safety Council to require specific advisory services on radiological protection from the licensees of nuclear and radioactive facilities (Official State Gazette 05.10.2005).
- ✓ Nuclear Safety Council Instruction IS-09, of June 14th 2006, establishing the criteria to be adhered to by 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 July 25th 2006, establishing criteria for the reporting of events to the Council by nuclear power plants (Official State Gazette 03.11.2006).
- ✓ Nuclear Safety Council Instruction IS-11, of February 21st 2007, on personnel licences for the operation of nuclear power plants (Official State Gazette 26.04.2007).
- ✓ Nuclear Safety Council Instruction IS-12, of February 28th 2007, on the training of non-licensed personnel at nuclear power plants (Official State Gazette 11.05.2007).
- ✓ Nuclear Safety Council Instruction IS-13, of March 21st 2007, on radiological criteria for the release of nuclear power plant sites (Official State Gazette 07.05.2007).
- ✓ Nuclear Safety Council Instruction IS-14, of October 24th 2007, on resident CSN inspectors at nuclear power plants (Official State Gazette 08.11.2007).
- ✓ Nuclear Safety Council Instruction IS-15, of October 31st 2007, on requirements for monitoring of the efficiency of maintenance activities at nuclear power plants (Official State Gazette 23.11.2007).
- ✓ Nuclear Safety Council Instruction IS-16, of January 23rd 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 January 30th 2008, on the homologation of training courses or programmes for personnel operating or directing the operation of equipment at X-ray facilities for medical diagnosis and accreditation of the personnel of such facilities (Official State Gazette 19.02.2008).
- ✓ Nuclear Safety Council Instruction IS-18, of April 2nd 2008, on the criteria applied by the Nuclear Safety Council in requiring the licensees of radioactive facilities to report on radiological events or incidents (Official State Gazette 16.04.2008).
- ✓ Nuclear Safety Council Instruction IS-19, OF October 22nd 2008, on the requirements of the nuclear facilities management system (Official State Gazette 08.11.2008).
- ✓ Nuclear Safety Council Instruction IS-20, of January 28th 2009, establishing safety requirements relating to spent fuel storage casks (Official State Gazette 18.02. 2009).
- ✓ Nuclear Safety Council Instruction IS-21, of January 28th 2009, on requirements applicable to nuclear power plant modifications (Official State Gazette 19.02.2009).
- ✓ Nuclear Safety Council Instruction IS-22, of July 1st 2009, on safety requirements for ageing management and long-term operation of nuclear power plants (Official State Gazette 10.07.2009).
- ✓ Nuclear Safety Council Instruction IS-23, of November 4th 2009, on in-service inspections at nuclear power plants (Official State Gazette 24.11.2009).
- ✓ Nuclear Safety Council Instruction IS-24, of May 19th 2010, regulating the filing of nuclear facility documents and records and their retention period (Official State Gazette 01.06.2010).

- ✓ Nuclear Safety Council Instruction IS-25, of June 9th 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 June 16th 2010, on basic nuclear safety requirements applicable to nuclear facilities (Official State Gazette 08.07. 2010).
- ✓ Nuclear Safety Council Instruction IS-27, of June 16th 2010, on general nuclear power plant design criteria (Official State Gazette 08.07.2010).
- ✓ Nuclear Safety Council Instruction IS-28, of September 22nd 2010, on the operating technical specifications to be met by second and third category radioactive facilities (Official State Gazette 11.10.2010).
- ✓ Nuclear Safety Council Instruction IS-29, of October 13th 2010, on safety criteria for spent fuel and high level radioactive waste temporary storage facilities (Official State Gazette 02.11.2010).
- ✓ Nuclear Safety Council Instruction IS-30, of January 19th 2011, on the requirements of nuclear power plant fire-fighting programmes (Official State Gazette 16.02.2011).

ANNEX B

NUCLEAR AND RADIOACTIVE FACILITIES LICENSING PROCESS

The process of licensing both nuclear and radioactive facilities is governed by the Regulation on Nuclear and Radioactive Facilities (RNRF), approved by Royal Decree 1836/1999, of December 3rd, and modified by Royal Decree 35/2008, of January 18th.

According to the RINR, these authorisations are granted by the Ministry of Industry, Tourism and Trade (MITYC), to which the corresponding requests should be addressed, along with the documentation required in each case. The MITYC sends a copy of each request and accompanying documentation to the Nuclear Safety Council (CSN) for its mandatory report.

The CSN reports are mandatory and binding, both when negative or withholding in nature with respect to the request and, when positive, as regards the conditions established.

Where appropriate the MITYC will send a copy of all the documentation to those Autonomous Communities that have competences in relation to land planning and the environment and in whose territory is located the facility or the planning area contemplated in the basic standards on planning for nuclear and radiological emergencies for them to submit their allegations within a period of one month.

On receiving the report from the CSN, and following whatever decisions, further reports or allegations might be required in each case, the MITYC will adopt the appropriate resolution.

1. SYSTEM FOR THE LICENSING OF NUCLEAR FACILITIES

According to the definitions included in the RNRF, the following are 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 permanent storage of nuclear substances
5. Devices or facilities using nuclear fusion or fission reactions to produce energy or with a view to producing or developing new energy sources.

In compliance with the RNRF, the nuclear facilities require different permits or administrative authorisations for their operation, these being the preliminary or site authorisation, the construction permit, the operating permit, the authorisation for modification and the dismantling permit. The procedure for the awarding of each of these authorisations is regulated by the Regulation itself and is briefly described below.

✓ **Preliminary authorisation**

The preliminary or site authorisation constitutes official recognition of the objective proposed and of the suitability of the site selected. Awarding of this author-

isation allows the licensee to initiate works on the preliminary infrastructures authorised and to request the construction permit for the facility.

Requests for preliminary authorisations are required to be accompanied by the following documents:

a) Declaration of the needs to be covered and justification of the facility and of the site selected

b) Descriptive report on the fundamental elements making up the facility, along with basic information on the said installation

c) Preliminary construction project, including the phases and schedule for performance and a preliminary economic study of the financial investments and costs foreseen

d) Study on characterisation of the site and of the area of influence of the facility

e) Organisation foreseen for supervision of the project and quality assurance during construction

f) Description of the activities and preliminary infrastructure works to be performed.

As part of the process of dealing with such requests, a period of public information is opened, this being described in detail in point 3 of this Annex.

✓ **Construction permit**

This empowers the licensee to initiate the construction of the facility and to request the operating permit.

This request should be accompanied by the following documentation:

a) General design of the facility

b) Procurement schedule

c) Budget, financing and performance schedule and framework for technical collaboration

d) Economic study updating the one submitted with the preliminary request

e) Preliminary safety analysis, which in turn should 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 study
5. Update on the organisation foreseen by the requesting party for supervision of project performance and quality assurance during construction
6. Organisation foreseen for future operation of the facility and preliminary operating personnel training programme
7. Pre-operational radiological environmental surveillance programme
8. Quality assurance programme for construction

f) Technological, economic and financing forecasts for dismantling and decommissioning

g) Administrative awards and authorisations to be granted by other Ministries and public Administrations or documents accrediting their request in compliance with all the necessary requirements.

During the construction and assembly of a nuclear facility, and prior to loading of the fuel or the acceptance of nuclear substances at the facility, the licensee of the authorisation is obliged to undertake a programme of pre-nuclear tests accrediting the adequate performance of the equipment or parts making up the installation, in relation both to nuclear safety and radiation protection and to the applicable industrial and technical standards.

The pre-nuclear testing programme will be proposed by the licensee of the authorisation and will require the approval of the Directorate General for Energy Policy and Mines, following a report from the CSN.

The results of the pre-nuclear testing programme will be submitted to the Directorate General for Energy Policy and Mines and to the CSN for analysis before the operating permit may be granted.

✓ **Operating permit**

This permit allows the licensee to load the nuclear fuel or introduce nuclear substances into the facility, to carry out the programme of nuclear tests and to operate the facility within the set of conditions established in the authorisation. This permit is first granted provisionally until the nuclear tests have been satisfactorily completed.

In order to obtain the operating permit, the licensee must submit the following documents:

a) Safety study: this must contain sufficient information for performance of an analysis of the facility from the point of view of nuclear safety and radiological protection, and must refer to the following issues:
   1. Complementary data on the site and its characteristics obtained during construction
   2. Description of the facility and of the processes that will take place in it
   3. Analysis of foreseeable accidents and of their consequences
   4. Analytical radiological study of the facility
   5. Operational radiological environmental surveillance programme.

b) Operating regulation: This should contain the following information:
   1. List of job posts entailing nuclear responsibility
   2. Organisation and functioning of the personnel and a description of the safety management system implemented.
   3 Standards for operation under normal and accident conditions. Operating Technical Specifications (OTS's): these shall contain the limit values for variables affecting safety and the minimum operating conditions.

c) Site emergency plan: This shall detail the measures foreseen by the licensee and the assignment of responsibilities to address accident conditions

d) Nuclear testing programme: This shall describe the tests, their objectives, the specific techniques to be used and the results expected.

e) Quality assurance manual: This shall establish the scope and content of the quality programme applicable to safety-related systems, structures and components.

f) Radiological protection manual: This shall include the facility's radiological protection standards.

g) Radioactive waste management plan: This shall include a system for the possible declassification of such wastes.

h) Final economic study: This shall analyse compliance with the economic and financial forecasts and establish the full and effective cost of the facility.

i) Dismantling and decommissioning forecasts: This shall establish the final disposal arrangements foreseen for the wastes generated and include a study of the cost and economic and financial forecasts to guarantee decommissioning.

j) Physical protection plan: This shall describe the measures to be adopted in order to achieve an acceptable level of security. This will be dealt with confidentially.

On completion of the nuclear testing programme, the licensee shall submit the results to the Directorate General for Energy Policy and Mines and to the CSN, along with a proposal for modifications to the OTS's if these were advisable in view of the tests performed.

The CSN will issue a report to the MITYC on the results of the tests and the modifications to be made, where appropriate, and on the conditions of the operating permit for the time period established. The MITYC will then issue the operating permit for the corresponding period.

✓ **Authorisation for modification**

The RNRF establishes that all 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 that the criteria, standards and conditions on which the authorisation is based continue to be fulfilled. If, as a result of such analyses, the licensee were to conclude that the aforementioned requirements continue to be met, he may carry out the modifications, periodically reporting to the competent regulatory authorities. If, on the contrary, the design modification implies a change in the criteria, standards and conditions on which the operating permit is based, the licensee shall be required to request an authorisation for it, which must necessarily be issued to him before the modification enters into service or tests are performed. Regardless of the aforementioned modification, whenever in the judgment of the regulatory authorities the modification is major in its scope or implies significant construction or assembly works, the licensee is required to request authorisation for the performance and assembly of the modification, this authorisation to be obtained before initiating assembly or construction activities in relation to this type of modifications.

The request for the modification authorisation should be accompanied by the following documentation:

a) Technical description of the modification

b) Safety assessment

c) Identification of the documents that would be affected by the modification

d) Identification of the tests to be performed prior to re-initiating operation

When required, requests for authorisation to perform and assemble modifications should be accompanied by the following documentation:

a) General description of the modification, identifying the underlying causes for it

b) Standards to be applied in the design, construction, assembly and testing of the modification

c) Basic design of the modification

d) Organisation foreseen and quality assurance programme for performance of the project

e) Identification of the scope and content of the analyses required to demonstrate the compatibility of the modification with the rest of the facility and to guarantee that the levels of safety of the facility continue to be maintained

f) Destination of equipment to be replaced

g) Procurement plan and budget in the case of major modifications.

✓ **Authorisation for dismantling**

On expiry of the operating permit, this authorisation allows the licensee to initiate activities for decontamination, the disassembly of equipment, the demolition of structures and the removal of materials, the ultimate aim being to allow for the full or restricted release of the site. The dismantling process will finish with the declaration of decommissioning.

The request for the decommissioning permit shall be accompanied by the following documentation:

a) Safety analysis

b) Operating regulation

c) Technical specifications applicable during the dismantling phase

d) Quality assurance manual

e) Radiological protection manual

f) Site emergency plan

g) Radioactive waste and spent fuel management plan

h) Site restoration plan

i) Economic study of the dismantling process and financial arrangements to address it

j) Physical protection plan

k) Plan for the control of declassifiable materials.

The decommissioning permit will include the general approach to be adopted and, if the process is to be carried out in different phases, will regulate only the activities foreseen for the immediate phase of performance.

On completion of the dismantling activities, and once the forecasts of the radioactive waste management plan have been met and the CSN has verified achievement of the technical conditions established in the dismantling programme, the MITYC will issue the declaration of decommissioning, following a report by the CSN. This declaration will release the licensee of the facility from his responsibility as operator and define, in the event of restricted release of the site, the applicable limitations on use and the party responsible for maintaining such limitations and monitoring compliance with them.

Prior to issuing the declaration of decommissioning, the aforementioned Ministry will transfer the matter to the Autonomous Communities having competences in

relation to land planning and the environment and in whose territory the facility is located for them to submit any allegations within a period of one month.

2. System for the licensing of radioactive facilities

According to the RNRF, radioactive facilities are understood to be as follows:

- ✓ Facilities of any type that contain a source of ionising radiations
- ✓ Apparatus producing ionising radiations and operating at a difference of potential in excess of 5 kV
- ✓ Establishments, laboratories, factories and facilities at which radioactive materials are produced, used, possessed, treated, handled or stored, except in the case of incidental storage during transport.

Radioactive facilities are divided into three categories.

1. First category radioactive facilities are those involved in the nuclear fuel cycle, industrial irradiation installations and those complex installations at which very high inventories of radioactive substances having a potentially significant radiological impact are handled.
2. Radioactive facilities involved in the nuclear fuel cycle, that is to say manufacturing installations producing uranium, thorium and their compounds, or facilities producing natural uranium fuel assemblies, will require the same authorisations as nuclear facilities. The requests and arrangements for such authorisations, and their awarding, shall be carried out in accordance with the process described above in section 1, with the corresponding documents adapted to the special characteristics of these facilities.
3. Radioactive facilities used for scientific, medical, commercial or industrial purposes are classified in one category or another on the basis fundamentally of their radiological characteristics. This type of facilities will require an operating permit, a declaration of decommissioning and, where appropriate, authorisation for modification or change of licensee.

The request for the operating permit for radioactive facilities with scientific, medical, commercial or industrial purposes shall 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 of an accident.

c) Verification of the facility: Containing a description of the tests to which it has been subjected

d) Operating regulation: Practical measures guaranteeing the safe operation of the facility

e) List of foreseen personnel, organisation and responsibilities of each job post

f) Site emergency plan: Measures foreseen and assignment of responsibilities to address accident conditions

g) Arrangements foreseen for decommissioning and economic coverage to guarantee it

h) Economic budget of the investment to be made

In the case of first category facilities, the following documentation shall also be submitted:

a) Information on the site and surrounding area.

b) As part of the Operating Regulation:

- Quality Assurance Manual
- Radiological Protection Manual
- Operating Technical Specifications.

c) Physical Protection Plan.

The Ministry of Industry, Tourism and Trade shall be responsible for the granting of operating permits, authorisations for the change of licensee and declarations of decommissioning for first category radioactive facilities, although the Order issued by the MITYC ITC/2783/2010, of October 28th, delegates these competences on the Secretary of State for Energy. These authorisations will include transfer of the corresponding documentation to the Autonomous Community for the submittal of allegations within a period of one month.

The granting of all other authorisation for radioactive facilities regulated in this chapter shall be the responsibility of the Directorate General for Energy Policy and Mines.

When the licensee is ready to initiate the operation of the facility, he shall notify the CSN for the latter to perform an inspection of the installation. Once the CSN considers that the facility is in a position to operate safely, it will inform the MITYC for the latter to issue a Start-Up Notification, which will empower the licensee to initiate operation of the facility.

Changes affecting the ownership of the facility, its location, the activities that may be performed under the authorisation granted, the category of the facility or the incorporation of particle accelerators or additional radioactive material not previously authorised shall require authorisation via the same process as that applied for issuing of the operating permit.

Changes and modifications affecting other aspects of the design or operating conditions authorised for the facility shall require only the express acceptance of the Nuclear Safety Council prior to implementation, the latter informing the Ministry of Industry, Tourism and Trade.

Requests for the declaration of decommissioning shall be accompanied by the following documentation:

a) Technical decommissioning study

b) Economic study, including the cost of decommissioning and financing arrangements foreseen

Once the CSN has checked for the absence of radioactive substances or equipment producing ionising radiations, and the results of the contamination analysis of the facility, it will submit a report to the MITYC, which will issue the declaration of decommissioning for the installation.

In accordance with the provisions of the Spanish Constitution, the different Statutes of the Autonomous Communities and the corresponding legal provisions, the services and functions of the MITYC dealing with second and third category radioactive facilities have been transferred to the various Autonomous Communities. The Autonomous Communities affected by these transfers are those of Catalonia, the Basque Country, the Balearic Islands, Murcia, Extremadura, Asturias, Madrid, Galicia, Cantabria, the Canary Islands, Ceuta, Navarra, Valencia, Castilla y León, La Rioja and Aragón[1].

[1] The third additional provision of Law 15/1980, creating the CSN, empowers this Organization to commission to the Autonomous Communities the exercising of certain functions attributed to it. However, these commissions are not considered to constitute transfers, since, in accordance with the Law by which it was created, the CSN is the body solely responsible for nuclear safety throughout the entire national territory.

3. Public information and participation in the process of authorising facilities

Both the RINR and the standards relating to environmental impact require processes of public information, the most relevant of which is the one undertaken with respect to the preliminary authorisation of the facility. It would also be interesting to mention Law 27/2006, of July 18th, which regulates rights to access information, public participation and the right to justice in relation to environmental matters, and which recognises the right of any physical or legal person to access information on the environment in the hands of the public Administrations, as well as the obligation of the latter to make available such information. Likewise, Spain has approved and ratified in 2004 the Convention on Access to Information, Public Participation in Decision-Making and Access to Justice in issues relating to the environment, done in Aarhus (Denmark).

As regards the arrangements for the preliminary authorisation for nuclear and radioactive facilities involved in the nuclear fuel cycle, the RNRF establishes that on reception of the request, the Regional Office of the Government in the Autonomous Community in which the facility is to be located will open a period of public information. This will begin with publication in the Official State Gazette and in that of the corresponding Autonomous Community of an announcement indicating the objective and the main characteristics of the facility, such that within thirty days of such publication those persons and entities considering themselves to be affected by the project may present whatever allegations they deem to be appropriate. On expiry of the thirty day period of public information, the said Government Office shall carry out the pertinent checks, as regards both the documentation submitted by the public and the written allegations, and shall issue a report, sending the file to the MITYC and a copy to the CSN.

The legal provisions on environmental impact[1] establish that the following shall be subject to an environmental impact assessment: public or private projects consisting of the performance of works, facilities or any activity relating, among others, to nuclear power plants and other nuclear reactors and facilities designed for the production or enrichment of nuclear fuel, the treatment of irradiated nuclear fuel or of high level waste, the disposal of irradiated nuclear fuel, exclusively the disposal of radioactive waste and exclusively the storage (for more than ten years) of irradiated nuclear fuels or radioactive waste at locations different from those at which they were produced. The process of public information shall be carried out jointly for the environmental impact assessment and the preliminary authorisation for the facility. The environmental impact statement shall be drawn up by the Ministry of the Environment in coordination with the CSN and shall be issued jointly with the preliminary authorisation for the facility.

Furthermore, the RNRF also requires that an information Committee be in operation during the construction, operation and dismantling of nuclear power plants, this being a collegiate body whose missions are to inform the different entities represented on the development of the activities regulated in the corresponding authorisations and jointly deal with questions of interest for these entities. The committee is presided over by a representative of the MITYC and includes one representative each of the licensee of the facility, the CSN, the Government Delegation, the Autonomous Community and the municipal area or areas in whose territory the facility is located. Other representatives of the Public Administrations may also sit on the Committee when the nature of the matters to be dealt with so requires.

[1] *Legislative Royal Decree 1/2008, of 11th January, that states the new text of the Act on Environmental Impact Assessment of projects, amended by Act 6/2010, of 24th March. Act 9/2006, of 28th April, on environmental assessment of certain plans and programs. Rules for the Environmental Impact Assessment, approved by RD 1131/1988, of 30th September.*

In operation at municipal level is the Association of Municipalities with Nuclear Power Plants (AMAC), which acts as a go-between with the Administration regarding a series of aspects relating to nuclear power plants.

At another level of information and in general the CSN is assigned, among other functions, that of informing the public on matters within its realm of competence, without prejudice to the advertising of its administrative activities in the legally established terms.

ANNEX C

REFERENCES TO OFFICIAL NATIONAL AND INTERNATIONAL REPORTS RELATING TO SAFETY

National Reports

- ✓ Annual CSN reports to the two Houses of the Spanish Parliament and to the Parliaments of the Autonomous Communities concerned.
- ✓ Decisions on nuclear safety and radiological protection submitted by the CSN to the Ministry for authorisations for nuclear and radioactive facilities.
- ✓ Reports on aspects of safety and radiation protection in relation to radioactive waste management submitted by the CSN to the Congressional Commission for Industry and Energy.

International Reports.

- ✓ National reports on the Convention on Nuclear Safety.
- ✓ National report on the Turkey Protocol, deriving from the Barcelona Convention.
- ✓ National reports on the OSPAR Convention.
- ✓ Reports to the IAEA on illicit trafficking with radioactive material.
- ✓ Reports to the European Commission in compliance with the EURATOM Treaty.
- ✓ Notifications to the European Commission in the event of radiological emergency (ECURIE system)
- ✓ Notifications to the IAEA emergency response system.

ANNEX D

REFERENCES TO REPORTS OF INTERNATIONAL EXAMINATION MISSIONS PERFORMED ON REQUEST BY A CONTRACTING PARTY

EVALUATION OF TRACKING 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 that the International Atomic Energy Agency (IAEA) carried out in Spain in 2008. That mission, requested by the Spanish Government in response to a request by the Nuclear Safety Council (CSN), was the first of its type to be full-scope, including aspects relating to security as well as the following subject areas: legislative and governmental responsibilities; the responsibilities and functions of the regulator; organisation; the process of authorisation; the review and evaluation of licensee requests; inspection and the sanctions system; the drawing up of regulations and guides and the management system of the organisation.

The follow-up mission focussed on the progress made by the CSN in responding to the recommendations and suggestions made by the IRRS mission in 2008 and on review of those areas that had changed significantly since that time. Both aspects have covered the safety and physical protection of the overall set of facilities and activities relating to the field of nuclear regulation in Spain.

The team of experts concluded that the CSN has significantly improved its regulatory activities overall, having made significant progress in most of the areas for improvement identified b y the mission, as a result of which these may be considered closed. Likewise, strengths have been identified and new recommendations and suggestions have been made with a view to continuing to strengthen the Spanish regulatory system. All of these will be tracked by the integral and systematic action plan implemented by the CSN.

ANNEX E

CSN EMERGENCY SITUATIONS ORGANISATION

In Spain the management of nuclear and radiological emergencies is regulated by the national civil defence system and the requirements for the use of nuclear energy and ionising radiations.

From the perspective of civil defence, the system establishes the general principles governing the organisation, responsibilities and the rights and obligations of the members of the public, the public administrations and the licensees of practices in relation to planning, preparedness and response to emergency situations. Also established are the emergency plans for actions outside the facilities when accidents occurring on site have repercussions for third parties.

As regards nuclear regulation, emergency plans are required to exist for each radiological practice and specific criteria are established in relation to the levels and techniques for intervention and the protective measures on which the plans are based.

Given the specific nature of nuclear and radiological emergencies, the Nuclear Safety Council (CSN) undertakes a series of functions in this area that go beyond the realm of competence strictly corresponding to it as the nuclear regulatory body.

In order to be able to fulfil these functions with a suitable degree of efficiency and effectiveness, the CSN has an Emergency Response Organisation (ERO), complementary to its normal working organisation, the operational structure of which is under the exclusive command of the President, who exercises the function of directing the organisation and of taking the appropriate decisions. The CSN technological and logistical units participate in this organisation in accordance with an action plan established specifically for such cases and that is activated depending on the level of severity of the accident giving rise to the emergency.

The CSN Emergency Room (SALEM), which is permanently manned, receives notifications of emergencies, this possibly leading to the activation of the ERO emergency stand-by team, capable of responding to emergency situations within one hour.

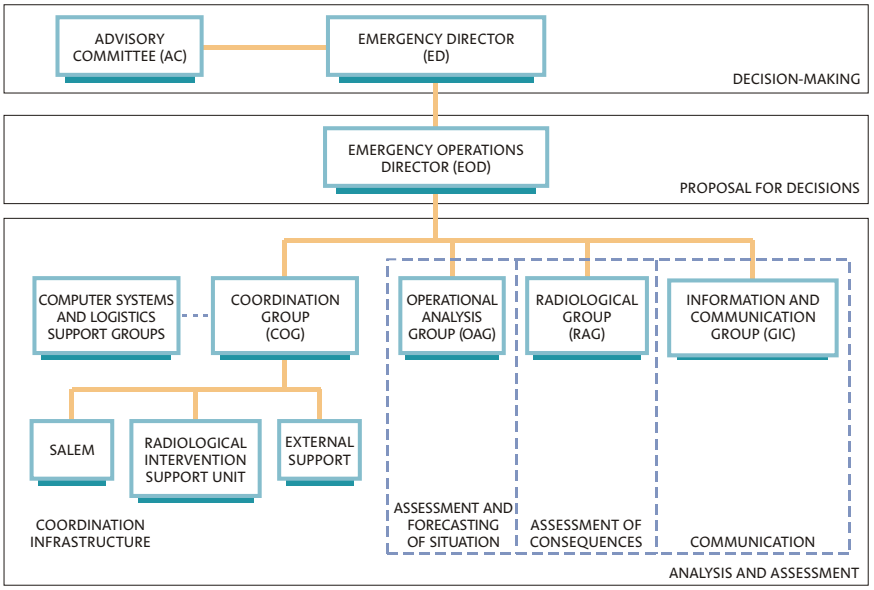
The SALEM, the architectural configuration and communications systems of which were updated in 2007, is equipped with adequate communications systems and evaluation tools designed to advise the emergency plan directors of the level of off-site response to be activated, the most conservative evolution of the accident, its potential consequences and the radiological protection measures to be implemented to Project the population.

The CSN Emergency Response Plan includes a personnel training plan that is independent from the training plans for those required to intervene in the off-site emergency plans of the facilities, but coordinated with them. Likewise, the CSN Emergency Response Plan includes a programme of exercises and drills of internal, national and international scope that makes it possible to periodically check the operability of the organisation's technical capabilities and carry out appropriate improvements.

The ERO has a hierarchical structure acting in accordance with the principle of a single command, this being complementary to the ordinary organisation of the CSN.

The ERO is structured around the three following hierarchical levels:

- ✓ The Emergency Director, with advice from a committee made up of the members of the Plenary of the CSN not having ED responsibilities, is responsible for direct-



ing the ERO, taking decisions and transmitting the recommendations of the CSN to the management of the applicable emergency plan, cooperating with the authorities in the task of informing the public. The function of the Emergency Director (ED) corresponds to the President of the CSN.

- ✓ The Emergency Operations Director, who is responsible for coordinating all activities and for drawing up proposals for the recommendations to be transmitted by the ED to the management of the applicable emergency plan. The Emergency Operations Director is one of the Technical Directors of the Organisation.
- ✓ The Operating Groups, which are responsible for undertaking the technical activities required for drawing up of the proposals for the recommendations to be transmitted by the Emergency Director to the management of the applicable emergency plan, for activating and coordinating the intervention teams and for preparing the information to be communicated externally.

Specifically, the missions of the ERO Operating Groups are as follows:

- ✓ The mission of the Operating Analysis Group is to analyse the causes of the accident and predict its future evolution and to inform the EOD of the measures that should be taken to take the emergency situation to safe conditions, bearing in mind that the responsibility for decision-making and for adopting the measures required for this to occur correspond to the facility.
- ✓ The mission of the Radiological Group is to analyse the radiological situation arising from the accident, to propose to the EOD protective measures suitable to mitigate the radiological consequences for the population in general, property and the environment and to collaborate in their implementation.
- ✓ The mission of the Information and Communication Group is to provide to the other bodies of the ERO and to the organisations with which the CSN has prompt

notification commitments the information on the facility or place of the accident necessary for the performance of their functions. Likewise, the ICG is in charge of preparing the information on the emergency that is to be provided to the media and the population in compliance with the functions assigned to the CSN.

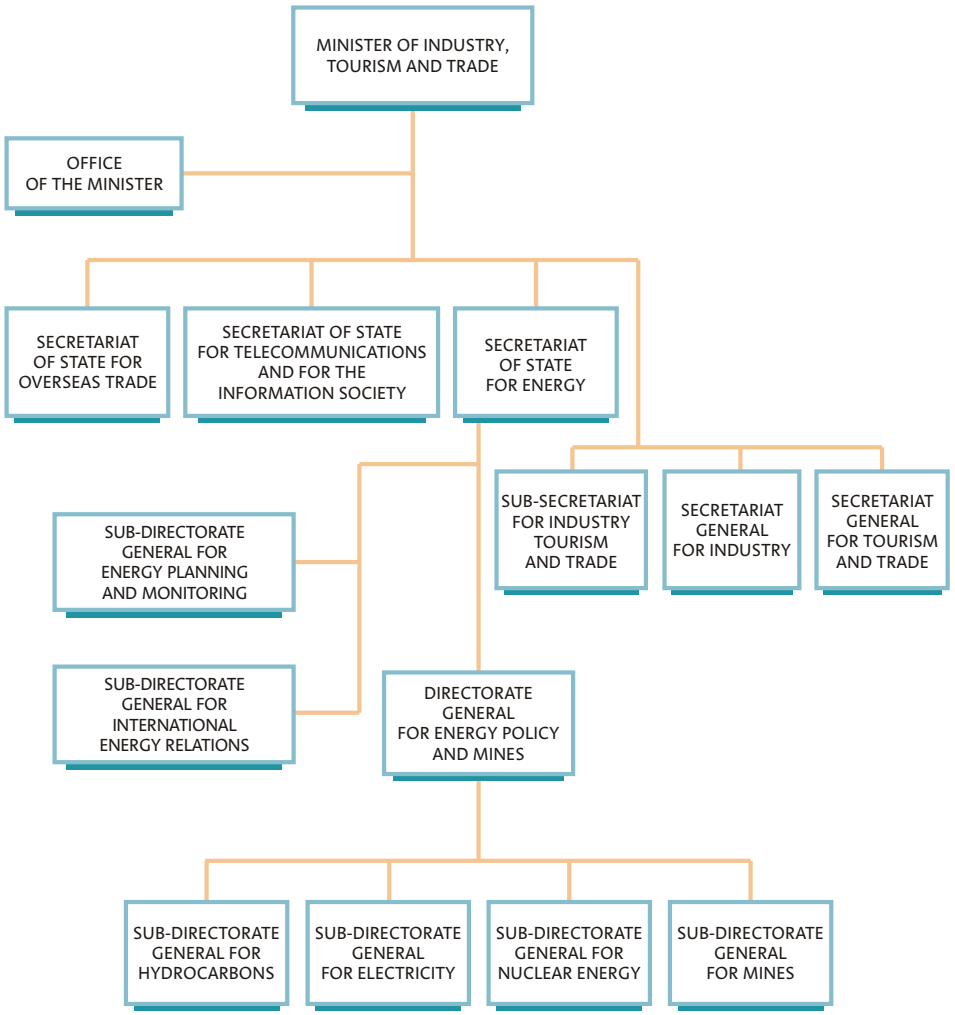
- ✓ The mission of the Coordination Group (CG) is to keep the infrastructure of the ERO fully operational and ensure the flow of information between its different bodies and with the outside world. This group coordinates the Computer Support and Logistical Support Groups and manages external support and emergency stand-by teams.
- ✓ The Computer Support Group ensures the operability of the CSN's corporate computer systems in the event of an emergency, providing where appropriate feasible alternatives guaranteeing compliance with the basic functions of the ERO and providing technical support to ensure the correct operability of the data-processing and communications equipment and systems to be used specifically by the different operating groups.
- ✓ The Logistical Support Group ensures the availability of the logistical resources required for operation of the ERO or provides feasible alternatives guaranteeing compliance with its basic functions, as well as ensuring the safety of the ERO.
- ✓ Among other functions, the Sub-Directorate General for Emergencies and Physical Protection is responsible within the CSN for maintenance and operation of the SALEM, the management of external support and the management of the emergency stand-by team, as a result of which the activities and responsibilities of the CG are closely linked to the operation of this Sub-Directorate.

The ERO may operate in four Response Modes (from 0 to 3) and its structure is variable depending on the severity, complexity and duration of the emergency and the level of responsibility in decision-making, adapting to the different levels of response as regards the composition of its staff: permanent or mode 0 (permanent attention technical staff); reduced or mode 1 (the former + E·OD); basic or mode 2 (the former + stand-by teams) and extended or mode 3 (which may involved all the CSN personnel).

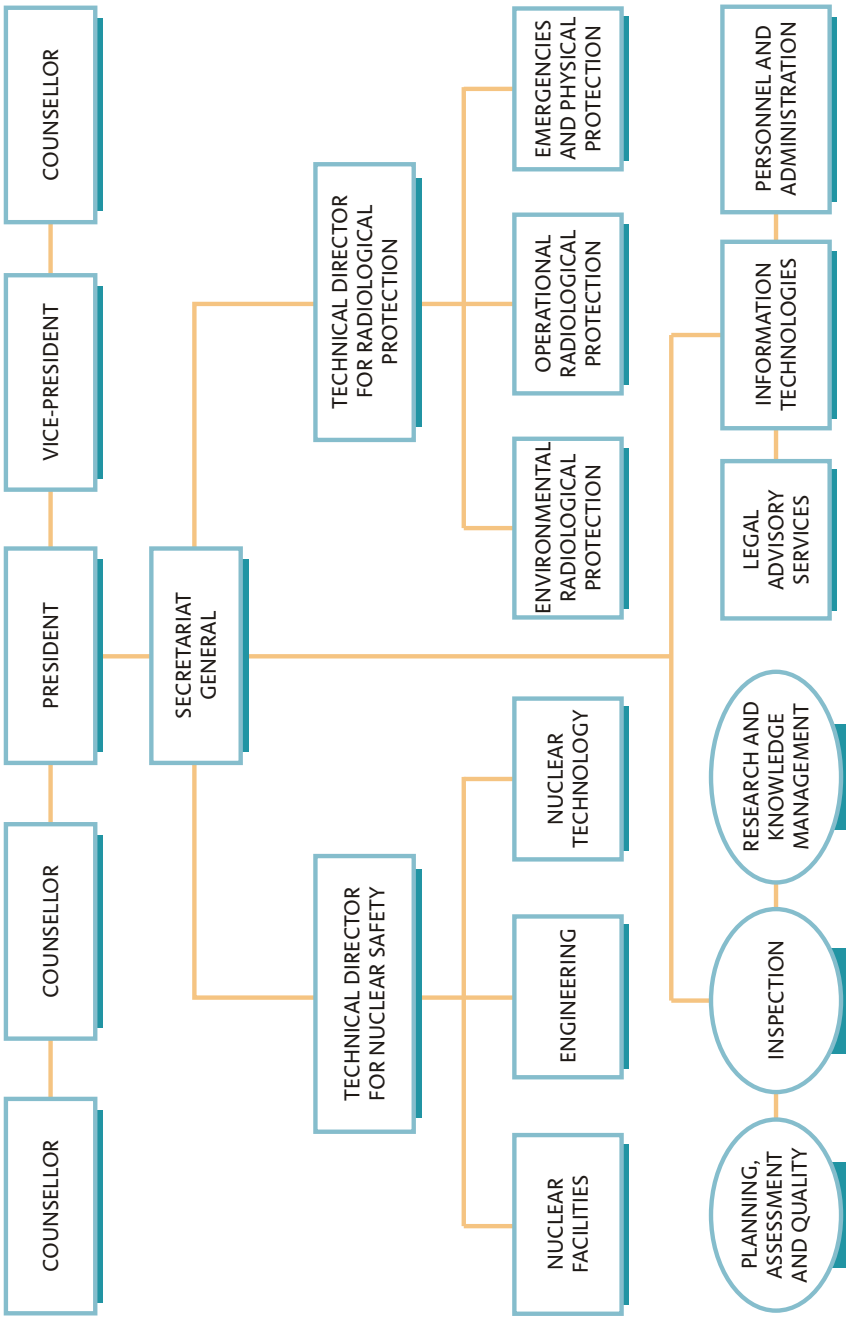
ANNEX F

Organisational flowcharts of organisations and institutions involved in the management of radioactive waste and spent fuel

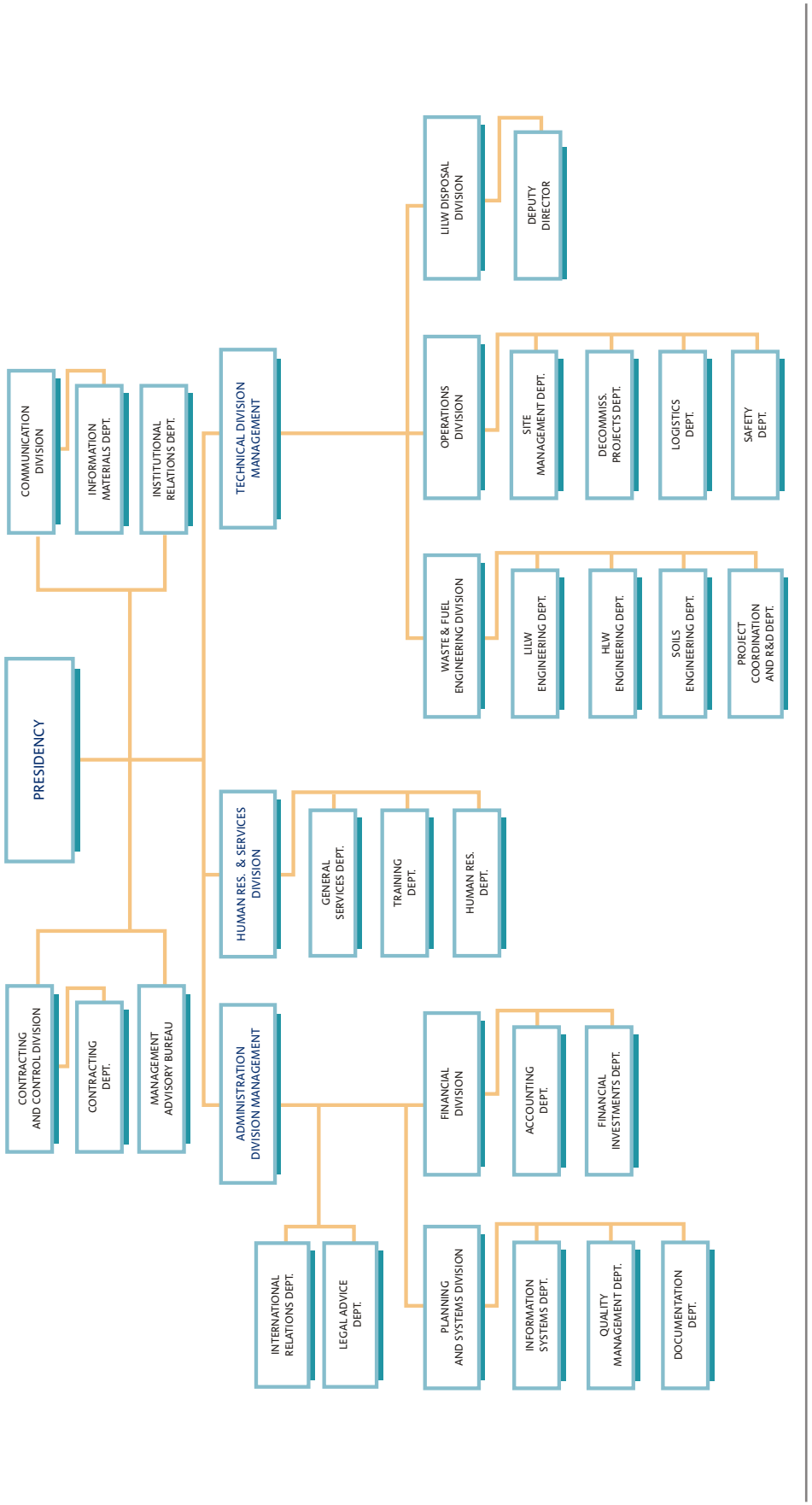
F1. Ministry of Industry, Tourism and Trade (MITYC)



F2. The Nuclear Safety Council (CSN)



F3. ENRESA


PRESIDENCY
COMMUNICATION DIVISION
INFORMATION MATERIALS DEPT.
INSTITUTIONAL RELATIONS DEPT.
CONTRACTING AND CONTROL DIVISION
CONTRACTING DEPT.
MANAGEMENT ADVISORY BUREAU
TECHNICAL DIVISION MANAGEMENT
LILW DISPOSAL DIVISION
DEPUTY DIRECTOR
OPERATIONS DIVISION
SITE MANAGEMENT DEPT.
DECOMMISS. PROJECTS DEPT.
LOGISTICS DEPT.
SAFETY DEPT.
WASTE & FUEL ENGINEERING DIVISION
LILW ENGINEERING DEPT.
HLW ENGINEERING DEPT.
SOILS ENGINEERING DEPT.
PROJECT COORDINATION AND R&D DEPT.
HUMAN RES. & SERVICES DIVISION
GENERAL SERVICES DEPT.
TRAINING DEPT.
HUMAN RES. DEPT.
ADMINISTRATION DIVISION MANAGEMENT
FINANCIAL DIVISION
ACCOUNTING DEPT.
FINANCIAL INVESTMENTS DEPT.
INTERNATIONAL RELATIONS DEPT.
LEGAL ADVICE DEPT.
PLANNING AND SYSTEMS DIVISION
INFORMATION SYSTEMS DEPT.
QUALITY MANAGEMENT DEPT.
DOCUMENTATION DEPT.

ANNEX G

Acronyms and abbreviations used

ALARA	As Low As Reasonably Achievable
AUM	Andújar Uranium Mill
B.O.E.	Spanish Official State Gazette
BWR	Boiling water reactor
CFR	Code of Federal Regulation of the United States
CIEMAT	Centro de Investigaciones Energéticas, Medioambientales y Tecnológicas (Centre for Energy-Related, Environmental and Technological Research)
CSN	Consejo de Seguridad Nuclear (Nuclear Safety Council)
CTS	Centralised temporary storage
DCP	Design change package
D.G.	Directorate General
DGD	Deep geological disposal
DGPC	Dirección General de Protección Civil y Emergencias (Directorate General for Civil Defence and Emergencies)
DGPEyM	Directorate General for Energy Policy and Mines
DOCE	Official Diary of the European Communities
EC	European Community
ECURIE	European Union urgent exchange of radiological information
EEC	European Economic Community
EIA	Environmental Impact Assessment
ENRESA	Empresa Nacional de Residuos Radiactivos, S.A.
ENUSA	ENUSA Industrias Avanzadas, S.A.
ERSP	Environmental Radiological Surveillance Programme
EURATOM	European Atomic Energy Community
GRWP	General Radioactive Waste Plan
HLW	High level waste
IAEA	International Atomic Energy Agency
ICRP	International Commission for Radiological Protection
ILW	Intermediate level waste
INEX	International nuclear emergency exercise
INPO	Institute of Nuclear Power Operations
IOP	Operating instruction

ISO	International standards organisation
JEN	Junta de Energía Nuclear (Nuclear Energy Board)
KWU	Kraftwerk Union A.G.
LILW	Low and intermediate level waste
MARM	Ministry of the Environment and Rural and Marine Affairs
MEH	Ministry of Economy
MITYC	Ministry of Industry, Tourism and Trade
M.O.	Ministerial Order
NEA-OECD	OECD Nuclear Energy Agency
NEP	National Energy Plan
NPP	Nuclear power plant
NRC	US Nuclear Regulatory Commission
NUREG	NRC technical publication
ODCM	Off-site Dose Calculation Manual
OECD	Organisation for Economic Cooperation and Development
OSPAR	Convention for the protection of the north-east Atlantic marine environment
OTS	Operating Technical Specification
PCP	Process control programme
PIMIC	Plan Integrado para la Mejora de las Instalaciones del Ciemat (Integrated Plan for Improvement of the Ciemat facilities)
PLABEN	Basic Nuclear Emergency Plan
PLAGERR	Radioactive Waste Management Plan
PSA	Preliminary Safety Assessment
PSR	Periodic Safety Review
PWR	Pressurised water reactor
R&D	Research and Development
R.D.	Royal Decree
RF	Radioactive facility
R.G.	NRC Regulatory Guide
RF	Radioactive facility
RNRF	Regulation on Nuclear and Radioactive Facilities
RPHIR	Regulation on the Protection of Health against Ionising Radiations
SA	Safety Assessment
SACOP	Operative Coordination Room
SALEM	Nuclear Safety Council Emergency Response Room
SEPI	Sociedad Española de Participaciones Industriales (Spanish State Industrial Holding Company)
SF	Spent fuel
SFSP	Spent fuel storage pool
SG	Safety Guide

SGEN	Sub-Directorate General for Nuclear Energy
UKAEA	UK Atomic Energy Authority
UPC	Polytechnic University of Catalonia
USA	United States of America
UNESA	Spanish Electricity Industry Association
VLLW	Very low level waste
WANO	World Association of Nuclear Operators

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