ESPAÑA

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

Second Spanish National Report

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

Second Spanish National Report

October 2003

Table of Contents

Section A

Introduction

A.1. Presentation of the report

The present document constitutes the Second Spanish National Report, issued in compliance with the requirements of article 32 of the Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management (hereinafter, Joint Convention), made in Vienna on September 5th 1997.

This report will be examined during the Review Meeting between the Contracting Parties contemplated in article 30 of the Joint Convention, which is scheduled to start on May 15th 2006. The Ministry of Industry, Tourism and Trade (Span. *Ministerio de Industria, Turismo y Comercio*, MITYC), the Nuclear Safety Council (*Consejo de Seguridad Nuclear,* CSN) and the Spanish radioactive waste management agency Empresa Nacional de Residuos Radiactivos, S.A. (ENRESA) have participated in drawing up this report. The information and data contained herein are those available as of December 31st 2004, unless some other date is expressly specified.

The objective is for this report to be not only explanatory but also critical and serve as a tool for assessment. In this respect, the criteria and guidelines used in its preparation have been as follows:

- ✓ As a starting point, the report has been drawn up taking into account the IAEA document INFCIRC/604 "Guidelines regarding the Form and Structure of National Reports" adopted by the Contracting Parties pursuant to article 29 of the Joint Convention.
- ✓ To the extent possible, repetition of the contents of the first National Report has been avoided, the progress made and novelties arising since the previous report being underlined and the data and explanations required to justify compliance with each article, or otherwise, being included.
- ✓ Consideration has been given to the comments and suggestions arising during the process of reviewing the previous National Report.
- ✓ At the end of the section corresponding to each article there is an assessment of the degree of compliance by Spain of the requirements established therein. Section K includes a general identification of those aspects that are considered to be open to improvement and of the measures to be adopted for this purpose.

The terminology of the Joint Convention has been used throughout this report, except in those sections in which the appropriate clarifications have been indicated[1].

It should specifically be pointed out that what is considered in the Convention under the generic name of "nuclear installation" corresponds in the Spanish legislation – and is considered in this sense throughout the present Report – not only to those facilities that are known under national law as "nuclear installations" – that is to say nuclear power plants, nuclear reactors, nuclear fuel manufacturing facilities, installations for the treatment of nuclear substances and installations for the storage of such nuclear substances – but also to those others that are qualified by the Spanish legislation as "radioactive installations", whenever radioactive material is produced, handled or stored at such facilities.

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

Spain possesses the infrastructure required for the management of spent fuel and radioactive waste from the administrative, technical and economic-financial points of view. As regards the administrative issue, there is an organisation, based on a relatively far-reaching and highly developed framework in keeping with the evolution of the international regulatory requirements, that contemplates and includes the main responsibilities of the different parties involved in the process.

The *Ministry of Industry, Tourism and Trade (MITYC)* plays the main role in controlling nuclear activities and is the organisation responsible for the granting of the corresponding permits and licences. The Government is also responsible for defining policy in relation to the management of radioactive waste and spent nuclear fuel. Section E, sub-section 20.1 of this report includes a more detailed description of its functions and organisation.

The *Nuclear Safety Council (CSN)* is solely responsible for nuclear safety and radiation protection. All authorisations issued by the MITYC are subject to an obligatory and binding report by the CSN. More information is likewise included in Section E, sub-section 20.1.

The *Ministry of the Environment (MIMA)* participates in the licensing process, drawing up the Environmental Impact Statement jointly with the Nuclear Safety Council.

Finally, 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. It was set up by Royal Decree in 1984 and has as its shareholders CIEMAT, a national research centre reporting to the Ministry of Education and Science, and the State industrial holding company Sociedad Española de Participaciones Industriales (SEPI), which reports to the Ministry of Economy and Finances. Section E, sub-section 19.5 includes a more extensive reference to ENRESA.

The figure 1 shows the institutional framework in Spain for the management of spent fuel and radioactive waste.

---

[1] *With a view to ensuring agreement with the Spanish standards, the term "residuo radiactivo" has been used preferably in the Spanish original for "radioactive waste", as a synonym for the term "desecho radiactivo" in the sense included in article 2 of this Convention.*

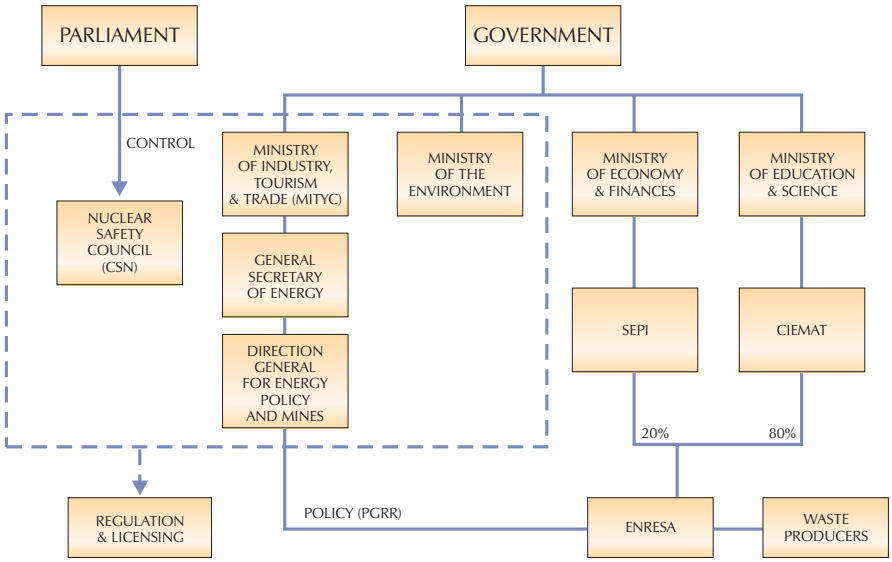


Figure 1. Institutional framework.

The spent fuel managed in Spain comes from the operation of the country's nine nuclear reactors, located at the seven sites that house its nuclear power plants: José Cabrera, Santa María de Garoña, Almaraz I and II, Ascó I and II, Cofrentes, Vandellós II and Trillo. In accordance with the Joint Convention, these plants are also radioactive waste management installations.

Spain also has other operating nuclear facilities: the fuel manufacturing facility at Juzbado in Salamanca, the CIEMAT nuclear facility in Madrid and the solid radioactive waste disposal facility at Sierra Albarrana (El Cabril) in the province of Córdoba.

In the decommissioning phase are the disused Vandellós I NPP (Tarragona), the Elefante Plant for the production of uranium concentrates and the mining installations, these last two located at Saelices el Chico (Salamanca).

Already decommissioned are the Andújar Uranium Mill in the province of Jaén and the Argos and Arbi experimental nuclear reactors, in Barcelona and Bilbao, respectively.

Figure 2 shows the location of the plants, reactors and other facilities, along with the number of radioactive facilities generating radioactive wastes in each province, the total number of which amounted to 1,330 as of December 31st 2004.

It should be pointed out that there are currently no projects for the construction of new nuclear power plants.

A.3. Actions performed in the area of spent fuel and radioactive waste management in Spain

In the last National Report submitted by Spain (Section K), and in the last corresponding review meeting, certain points were underlined as requiring further work in the area of

radioactive waste and spent fuel management and the submittal of more detailed information in subsequent reports. Specifically these were as follows:

- ✓ In Section K of the previous report three areas in which improvements might be made were identified: standards relating to both high level wastes (HLW) and spent fuel (SF) and to low and intermediate level wastes (LILW), Radioactive Waste Management Plans (PLAGERR) at production facilities and emergency plans.
- ✓ One of the comments addressed to Spain within the process of reviewing the first National Report referred to the appropriateness of specifying the steps being taken to determine the policy for the definitive management of HLW and SF as from the year 2010. That review also requested the inclusion in the next national report of more data on the institutional control of mines and tailings.

In recent years, the institutions and organisations involved in radioactive waste and spent fuel management have channelled their efforts in the directions pointed to at that time. This has led to improvements in certain practices and the issuing of certain standards and laws.

- ✓ As regards the *standards and laws* governing the management of spent fuel and radioactive wastes, Royal Decree 1349/2003 has been passed, on the Ordering of the ENRESA's Activities and their Financing. This Royal Decree brings together several previously scattered standards on the activities of ENRESA and adapts their requirements to current reality. ENRESA's functions have been updated and the different methods of payment for the services it renders have been redefined.

  Furthermore, Royal Decree Law 5/2005, on Urgent Reforms to Promote Productivity and Improve Public Contracting, introduces three important novelties in the field of radioactive waste management:

  - ➪ Firstly, it modifies the system for the financing of NPP spent fuel and radioactive waste management and for plant dismantling, establishing a system in which the plant licensees will be responsible for such financing as from April 1st 2005.
  - ➪ It establishes that the State will become the owner of the radioactive wastes once they have been sent for definitive disposal.
  - ➪ It likewise establishes that the State will be responsible for whatever surveillance might occur following the decommissioning of a nuclear or radioactive facility, once the period of time established in the corresponding Statement of Closure has elapsed.

  These new standards are specifically referred to in Section E, article 19 (legislative and regulatory framework) and in Section F, article 22 (financial resources), along with the references to standards novelties included where appropriate throughout the report.

- ✓ As regards the definitive management of high level radioactive waste and spent fuel, decision on which have been postponed until after the year 2010, mention may be made of the fact that the Sixth General Radioactive Waste Plan (Span. *Plan General de Residuos Radiactivos*, from hereon PGRR) is currently being drawn up and is expected to be approved by the end of 2005. This

Figure 2. Location of the plants, reactors and other facilities.

new Plan will establish an updated strategy for the management of these materials and those actions that might, where appropriate, provide support for the decision-making process.

As is indicated in this report, the fundamental objective is the construction of a centralised temporary storage facility for HLW and SF from the Spanish nuclear facilities, which will be required to be operational by 2010. As regards definitive management, work will continue for investigation of the possibilities of deep geological disposal, as well as of treatment techniques such as partitioning and transmutation. All this will be dealt with in an options report, which will be an important element in the decision-making process.

In relation to the final management of HLW and SF, Section G, article 10 (final disposal of SF) refers to novelties in management and planning, while policies and practices are generally dealt with in Section B.

✓ As has been indicated above in relation to the *institutional control of uranium mines and tailings following restoration,* RD Law 5/2005 on Urgent Reforms to Promote Productivity and Improve Public Contracting establishes that the State will undertake whatever surveillance might be required following the decommissioning of a facility, once the period established in the corresponding Statement of Closure has elapsed.

This issue is contemplated in Section H, article 17 of the report – institutional measures after closure.

- ✓ As regards the radioactive waste management plans (*PLAGERR)*, as indicated in Section H of this report and announced in the previous National Report, certain improvements have been made in their development and implementation and the improvement process continues.
- ✓ Finally, the guidelines of the *emergency plans* have been redefined, with the approval of a new Basic Nuclear Emergency Plan (PLABEN) in 2004. Section F of this report, Article 25 (emergency preparedness) provides more details on this aspect.

Section B

Policies and practices

This section covers the obligations referred to in Article 32 paragraph 1 of the Convention.

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

B.1. Policy and general strategy for the management of radioactive waste and spent fuel

B.1.1. General Radioactive Waste Plan

The Government establishes the general lines of the national policy on the management of radioactive waste and spent fuel through the General Radioactive Waste Plan (Span. *Plan General de Residuos Radiactivos*, *PGRR*).

Every four years the PGRR establishes the reference framework for the national spent fuel and radioactive waste management strategies. This Plan is an official document drawn up by ENRESA and submitted to the Ministry of Industry, Tourism and Trade (MITYC) in compliance with the requirements of the standards in force[2]. It is required to

[2] *Arts. 2 and 6 of RD 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 (BOE) number 268 of November 8th 2003, pp. 39654 and following.*

be submitted to the Government by the MITYC and, following its approval, communicated to Parliament.

As established in the standards, the PGRR must contain the following:

- ✓ The actions required 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 measures foreseen for the performance of these actions.

The PGRR currently in force is the Fifth, which was approved in July 1999. The Sixth PGRR is expected to be approved during 2005.

B.1.2. Contractual relations between ENRESA and the producers

Legal basis and objective of the contract

Producers generating radioactive wastes are obliged to opt for one of the two following routes[3]:

1) Possession of special facilities for the storage, transport and handling of the radioactive waste generated.
2) Establishment, by contract or any other document valid under Law, of the use of special facilities belonging to duly authorised companies. ENRESA was set up to carry out such activities.

In this manner, a contractual relation is established between ENRESA and the producers based on type-contracts, which must be approved by the MITYC and which cover two areas:

- ✓ As regards waste management, ENRESA defines the conditions for the reception of the wastes from the producers and promotes the actions required for optimisation, while for their part the producers condition the wastes generated in accordance with these instructions, contributing to the optimisation and improvement of the system obtained.
- ✓ As regards decommissioning and dismantling, ENRESA defines the conditions and the producers participate in the plans for the decommissioning and dismantling of their installations.

Obligations of the parties

In either of these two cases, the contracts drawn up between ENRESA and the waste producers will be governed by the following directives[4]:

---

[3] *Art. 3 of RD 1349/2003, of October 31st, on the ordering of the activities of the Empresa Nacional de Residuos Radiactivos, S.A. (ENRESA) and their financing, Oficial State Gazette (BOE) number 268 of November 8th 2003, pp. 39654 and following.*

[4] *Arts. 5 and 7 of RD 1349/2003, of October 31st, on the ordering of the activities of the Empresa Nacional de Residuos Radiactivos, S.A. (ENRESA) and their financing, Oficial State Gazette (BOE) number 268 of November 8th 2003, pp. 39654 and following.*

1) The term of the contract will extend to the end of the service lifetime of the facilities, including dismantling.

2) Payment for the services rendered may be made in different ways, as contemplated in the law, either by way of prices or percentages applicable to the end product or by billing to those generating the wastes, as is the case for the use of radioisotopes in industry, medicine, agriculture and research. These prices and tariffs are calculated taking into account the estimates of the PGRR and are transferred to a Fund for the Financing of the activities included in it. The financing system is detailed in Section F of this report (Art. 22, Human resources and financing).

B.2. Classification of radioactive wastes

The latest revision of 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 by radionuclides in concentrations or to levels of activity higher than 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 wastes in Spain, from the point of view of their management, is accomplished in accordance with the criteria adopted by the IAEA[5] and the European Union[6] and includes the following categories:

✓ Low and Intermediate Level Wastes (LILW): wastes whose activity is due mainly to the presence of beta or gamma-emitting radionuclides having a short or medium half life (less than 30 years) and whose content of long-lived radionuclides is very low and limited.

This group includes all wastes that may be disposed of at the El Cabril facility, and that consequently fulfil the acceptance requirements approved by the Regulatory Authorities, the CSN and the MITYC.

✓ High Level Wastes (HLW): those containing long-lived alpha-emitting radionuclides in appreciable concentrations in excess of 0.37 GBq/t, with a half-life of more than 30 years, reaching up to tens of thousands of years.

This category includes wastes that may not be disposed of at the aforementioned El Cabril facility, for which the definitive disposal route foreseen is deep geological disposal.

Table 1 includes a run down of radioactive waste classification and of the different management routes in force or foreseen.

---

[5] *Safety Series Nº. 111-G-1.1 Classification of Radioactive Wastes. Safety Guide. (IAEA, Vienna, 1994)*

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

Table 1
Radioactive waste classification.

Initial activity	Radioactive Period	
	Short and medium half life Main elements <30 years	Long half life Main elements >30 years
Very Low Level (VLLW)	Under licensing, surface disposal	In situ stabilisation at mining sites.
Low and Intermediate (LILW)	Existing surface disposal facility: El Cabril.	Under study in accordance with 5th PGRR
High Level (HLW)	Under study in accordance with 5th PGRR	

B.3.
Generation of spent fuel and radioactive waste

The following reference scenario is taken for the data offered below:

1. Seven nuclear power plants currently in operation (9 reactors), with an installed electrical power of 7,876 MWe.
2. NPP service lifetime of 40 years, except in the case of José Cabrera NPP.
3. Open fuel cycle without reprocessing of spent fuel abroad.
4. The complete dismantling of the NPP's currently in operation is initiated as from 3 years after definitive shutdown.

The total volume of conditioned radioactive waste to be managed in Spain and open to definitive disposal at the El Cabril facility, i.e. LILW, amounts to some 176,000 m^3, 57% of which, that is to say some 100,000 m^3, might be managed specifically due to their having very low levels of activity (VLLW).

The total volume of waste not open to definitive disposal at the El Cabril facility amounts to some 13,000 m^3, of which some 10,000 m^3 would be spent fuel and the remainder intermediate or high level waste.

Figure 3 shows the magnitudes and origins of these wastes.

As regards the *generation of spent fuel and high level waste,* it is calculated that some 6,700 tU of spent fuel will need to be managed. To this should be added those wastes that are not currently located in Spain but whose return is expected:

- ✓ Waste from the reprocessing in France of the spent fuel from Vandellós I NPP, of which 13 m^3 of high level vitrified waste and 670 m^3 of intermediate level wastes of different types are to be returned to Spain as from the year 2010.
- ✓ Waste from the reprocessing in United Kingdom of the spent fuel from Santa María de Garoña NPP, sent prior to 1983, minor quantities of fissionable material (U and Pu).

As regards the generation of low and intermediate level waste, figure 4 gives an idea of their typology, quantity and origin.

In relation to mining tailings and the production of uranium concentrates, it should be pointed out that there are now no mining installations in operation in Spain, some of

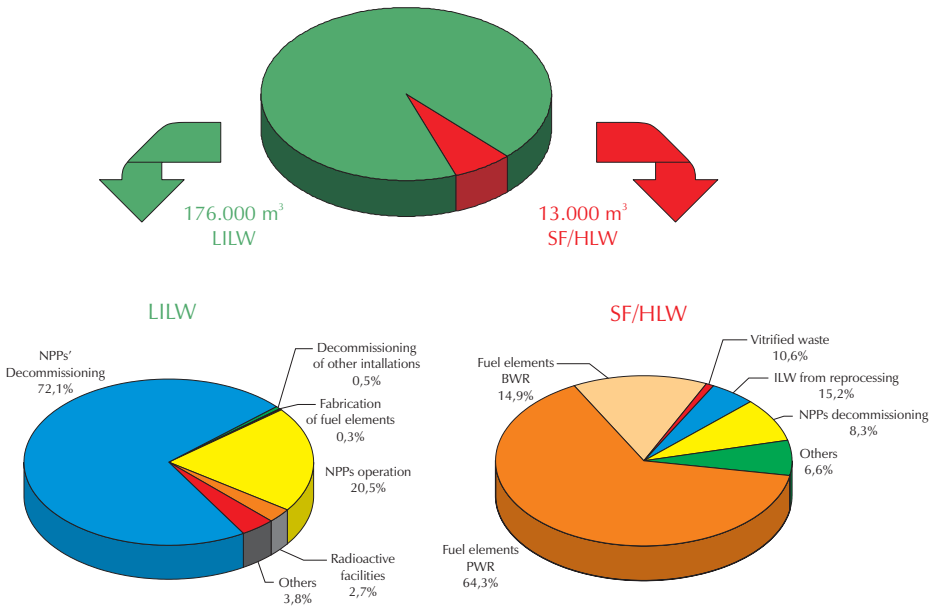
those previously existing now being in the phase of restoration and others having been restored. A detailed view of the tailings and concentrates associated with each facility may be found in Section D (Inventories and lists).

B.4.
Spent fuel management policies and practices

In the National Energy Plan (PEN) established by the Government for the period 1983-1992, the irradiated fuel from the country's light water reactors was considered to be a waste that was not to be reprocessed. Consequently, the nuclear fuel policy established was based on an open cycle approach. The first PGRR, approved in 1987, was based on this PEN in determining as follows:

The spent fuel from the nuclear power plants will be considered high level waste and its reprocessing will not be undertaken, with the exception of that generated by the Vandellós I plant, which is sent to France for such treatment.

This approach changed with the 5th PGRR, approved in July 1999. The new PGRR makes a clear distinction between spent fuel and high level waste and establishes, as regards the former, the need to refer to the possibilities existing for its direct management as such (open cycle) or its reprocessing to recover fissionable materials and reuse them as new fuel (closed cycle).



LILW: Conditioned Low and Intermediate Level Waste (including VLLW or very low level waste)
SF/HLW: Spent Fuel and encapsulated HLW (including intermediate level waste).

Figure 3. Proportional representation of the volume of radioactive waste generated in Spain.

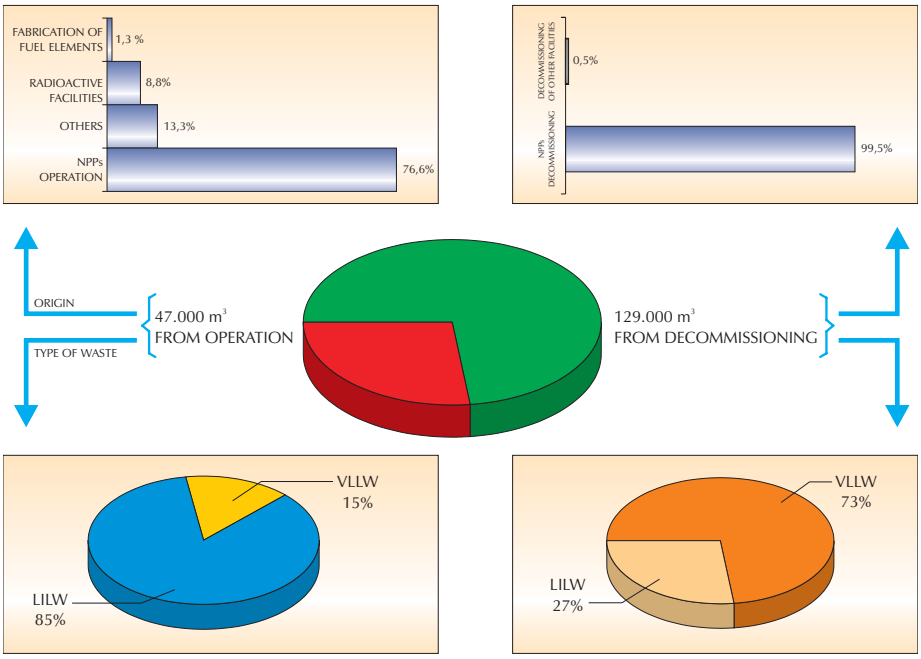


Figure 4. Low and Intermediate Level Waste (LILW/VLLW).

Notwithstanding the above, for the purposes of economic calculation and planning, the 5th PGRR is based on the open cycle scenario. The only spent fuel reprocessed to date has been that generated by the Vandellós I nuclear power plant, sent to France, and certain quantities sent by the José Cabrera and Sta. Mª de Garoña plants to United Kingdom prior to 1983. Vandellós I ceased its operations in 1989 and its fuel had to be completely reprocessed for technical reasons.

As regards the direct management of spent fuel, a distinction should also be made between two different concepts: temporary storage and definitive disposal.

B.4.1. Temporary storage

The objective of temporary storage is to provide sufficient capacity to house all the spent fuel generated by the Spanish nuclear power plants until such time as a definitive solution becomes available. The strategy is based on a gradual approach consisting of the following steps:

1. *Reracking* in order to take maximum advantage of the space existing in the NPP storage pools.
2. Complementing the storage capacity of the pools, as necessary, by means of *dry storage technologies*.
3. Construction of a *centralised temporary storage facility* for:
   - ➪ All the spent fuel,

- All long-lived radioactive wastes that cannot be sent to the existing LILW disposal facility,
- All reprocessing wastes returned from abroad.

As regards the first of these points – reracking – since 1982 all the light water reactor spent fuel generated by the Spanish plants has been stored in the plant pools on site. In view of the forthcoming saturation of the capacity of these pools, the original storage cracks were progressively replaced with more compact units during the 1990's. This has made it possible to defer the provision of a SF storage capacity additional to that of the pools themselves. Table 2 shows the level of saturation of the storage capacity of the Spanish plants. For the quantities of spent fuel at each plant, refer to Section D (Inventories and lists).

In relation to the second point – specific complements to storage capacity – special mention should be made of Trillo NPP, whose saturation was expected to occur in 2003. In order to solve this problem, a storage facility was constructed to house metallic casks at the plant site. This facility has been in operation since 2002.

The third point – construction of a centralised temporary storage facility – is a fundamental objective scheduled for the year 2010. Wastes other than SF whose final management cannot be undertaken at the El Cabril facility are normally stored temporarily at the production sites themselves or, in the case of reprocessing wastes, at facilities abroad.

Table 2
Saturation of Spent Fuel Pools.

Nuclear Power Plant	Entry into operation	End of design lifetime (40 years)	Year of saturation following reracking	Degree of occupation as of 31-12-04 (%) [1]
José Cabrera	1968	2008	—	61
Sta. Mª Garoña	1970	2010	2015	74
Almaraz I	1980	2020	2019	57
Almaraz II	1983	2023	2021	57
Ascó I	1983	2023	2012	71
Ascó II	1985	2025	2013	65
Cofrentes	1984	2024	2014	70
Vandellós II	1988	2028	2020	50
Trillo	1988	2028	2003	84

[1] Degrees of occupation and saturation dates considering a reserve capacity equal to one core load. The absence of a date for José Cabrera is due to the fact that definitive plant shutdown has been approved for 2006 and saturation will not be reached. In the case of the Trillo plant, the capacity has been complemented via an auxiliary storage facility.

This table clearly reflects the spent fuel storage requirements, since the date of saturation of the plant facilities, even following reracking, in many cases precedes that of the end of the design lifetime of the plant. Specifically, the José Cabrera NPP will cease to operate on April 30th 2006. Dismantling of this plant will imply managing all its SF production.

Likewise, the following issues are to be taken into account:

1. The return from France, as from the year 2010, of the high level waste from reprocessing of the fuel from the Vandellós I NPP.
2. The return, after 2008, of minor quantities of fissionable materials recovered during the process of reprocessing the spent fuel from the Santa María de Garoña NPP, sent to United Kingdom prior to 1983.
3. The dismantling of José Cabrera NPP will give rise to the generation of various waste types that will need to be managed as from 2009, when the SF has been removed from the plant.
4. Finally, the management of other types of wastes and certain spent sources that, given their characteristics, cannot be disposed of at the El Cabril facility, and which will require a temporary storage facility for the period necessary.

In view of the above, the strategy is based on the availability of a centralised temporary storage (CTS) facility by the year 2010. The usefulness of a CTS is an issue that has been an on-going consideration in recent years, and in this respect in December 2004 the Parliament urged the Government to collaborate with ENRESA in developing the criteria required for construction to begin, as well as to undertake whatever reforms and updates to the PGRR might be necessary for this purpose[7].

B.4.2. Definitive disposal

As regards the definitive management of spent fuel, HLW and long-lived waste, the different PGRR's have contemplated disposal in deep geological formations as the solution for these types of materials. The 5th PGRR currently in force postpones any decision regarding a definitive solution until the year 2010. Meanwhile, work should continue to investigate the possibilities for the following:

- ✓ Disposal in deep geological formations
- ✓ Participation in international research programmes on technologies such as partitioning and transmutation.

In view of the results obtained, in 2010 the Government should be provided with the information necessary for decision-making and the basic capacity required for their implementation.

ENRESA's short-term activities are aimed at drawing up reports on different aspects of the management options, from their social and legal aspects to technical studies on DGD or on new technologies such as partitioning and transmutation.

---

[7]Ref. to the Ninth Resolution Proposal in the presentation of the General Report on CSN activities before the Lower House of the Spanish Parliament on December 22nd 2004, published in the Official Gazette of Congress on December 30th 2004 (Series D, Number 132, pp. 29 and following.).

For the purposes of economic calculation and planning, the proposal for the new PGRR currently establishes the start-up of a DGD facility in the year 2050.

B.5. Radioactive waste management policies and practices

Given that high level and long-lived wastes have been dealt with in previous sections referring to SF, in this section reference will be made only to the management policy for low and intermediate level wastes (LILW).

LILW management has been resolved overall in Spain, the country having an integrated management system equipped with the necessary capacities, with the agents identified and with the bases required for structured operation. The central core of this system is the El Cabril LILW disposal facility, in operation since 1992 and designed fundamentally for the definitive disposal of this type of waste in solid format. In addition to serving for this main objective, the facility has various capacities designed to fulfil the following purposes:

1. Treatment of wastes from radioactive facilities and of those resulting from interventions at non-regulated installations. These activities are performed by way of various technological capacities, including installations for waste treatment and conditioning.
2. Performance of complementary treatment of waste from nuclear facilities.
3. Performance of tests for the acceptance of different waste types and for verification of their characteristics in specific laboratories, this being an important stage of management.

The facility also possesses temporary storage capacities and the workshops, laboratories and auxiliary systems required for its operation.

As has been pointed out above, these radioactive waste management services rendered by ENRESA to the operators of nuclear and radioactive facilities are governed by contracts based on corresponding type-contracts, which are subject to approval by the MITYC.

Waste transport is also the responsibility of ENRESA, this being accomplished either using in-house resources –in the case of waste generated by radioactive facilities- or via specialist companies –in the case of conditioned wastes-. Until such time as they are removed, the LILW are temporarily stored at the authorised facilities that the producers have at their sites. The schedules for the removal and transport of LILW to the El Cabril installations are drawn up on the basis of foreseen production rates and the capacity of the El Cabril centre. Some 200 transport operations of this type are routinely performed every year.

The operability and flexibility of the integrated national system have been reinforced with the experience acquired in the dismantling of fuel cycle facilities and of the Vandellós I NPP, as well as with the occurrence of incidents in the "non-regulated" industry, which have been assumed and have led to the establishment of principles for optimisation.

Consequently, the LILW management policy is aimed at optimising the system in the following areas:

1. *LILW from operating plants.* The nuclear power plants have capacities for the conditioning of waste, in accordance with the ENRESA acceptance specifications for the El Cabril facility, and temporary storage facilities for the drums conditioned with cement or precompacted pending their removal by ENRESA.

   Since 1995, ENRESA and the producers have been making coordinated efforts to minimise waste generation and volumes, these having led to a reduction of the LILW generated at the plants to less than one third. Future activities will continue with this policy of cooperation in reducing waste volumes, promoting the development and use of treatment, decontamination and characterisation equipment for materials to be recycled and research and innovation in these fields.

2. *LILW from radioactive facilities:* The aim is to continue with actions designed to improve the documentation of the tracking of generation of these wastes and help to optimise their production. A noteworthy element is the increasing application of the Order by the Ministry of Economy, ECO 1449/2003, of May 21st[8], which establishes measures for reduction of the volume of these wastes to be delivered to ENRESA.

3. *Optimisation of the capacity of El Cabril.* This line is based mainly on the development of a specific installation for the disposal of LILW.

   The occurrence in recent years of several incidents in the metallurgy industry and the future dismantling of the nuclear power plants point to the future existence of important volumes of radioactive wastes with very low contents of radioactivity.

   The resolutions of the Parliamentary Commission of Economy and Finances in 2001 and 2002[9] urged the Government to promote the development of specific solutions for the management of this type of waste, in order to ensure that maximum advantage be taken of the strategic value implied for the country by the available capacity of El Cabril. In May 2003, ENRESA requested the authorisations required for a complementary installation at El Cabril for VLLW. This installation consists of four tanks or cells constructed in accordance with the technical requirements of the Spanish and EU regulations on the disposal of hazardous wastes at tips, supported by a technological building, constructed in 2004, for the treatment – compacting and stabilisation – of VLLW.

   The target is for the first of these cells to enter operation in 2006.

---

[8]*MINISTERIAL ORDER ECO/1449/2003, of May 21st, on the management of solid waste materials with radioactive contents generated at 2nd and 3rd category radioactive facilities at which non-encapsulated radioactive isotopes are handled or stored. Oficial State Gazette number 134 of Thursday June 5th 2003, pp. 21840 and following.*

[9]*Reference to resolutions of the Parliamentary Commission of Economy and Finances and to resolution proposals relating to the general report on CSN activities and technical annexes corresponding to the year 2002, approved by the panel. Oficial Gazette of Congress. December 18th 2003 (Series D, Number 642), p. 7 and following.*

4. *Enhancement of the technological capacities of El Cabril.* The objective is to optimise the existing processes and prepare to address possible future situations.

   On the one hand, mention should be made of the entry into service this year of a system for the treatment of contaminated aggregate wastes, basically those generated as a result of incidents in the metal industry, through immobilisation in the containers normally used for the reconditioning of drums received from the nuclear facilities, thus optimising the occupation of the available volume.

   On the other hand, a new "Auxiliary Conditioning" building has been constructed, the objective being to implement LILW characterisation and decontamination techniques, or if necessary in the future, systems for the treatment of whatever wastes might arise as a result of incidents.

5. *Knowledge improvement.* Efforts will continue to be oriented towards improving waste package characterisation and measuring techniques and understanding of the performance of the disposal system – durability of engineered barriers – and safety assessment.

6. *Management of other LILW:* outside the contractual framework indicated above there is a series of wastes that, in view of their characteristics or origin, require special management, such as the following:

   a. *Radioactive lightning rod headers.* According to the Spanish standards[10], these lightning rods were required to be authorised in accordance with the specific radioactive regulations or removed by ENRESA as radioactive waste. As of December 31st 2004, some 22,100 headers have been removed, of which 18,500 have been exported for recycling of the isotope Am-241. This management is considered to have been closed as from March 2004, although the operating capacity required to address specific cases remains available.

   b. *Ion smoke detectors* (ISD's): This type of detectors incorporates a small radioactive source and its commercialisation and final management are regulated[11]. On reaching the end of the service lifetime of such detectors, the owners of those that do not fulfil the conditions for conventional management are required to request their removal by ENRESA. Prior to the approval of the aforementioned standards, ENRESA was already removing approximately 10,000 ISD's every year, the accumulated total as of December 31st 2004 amounting to some 67,000 such devices.

   c. *Radioactive materials beyond regulatory control.* By means of intervention orders or transfer resolutions the authorities initiate the mechanisms required for the safe removal and management of any radioac-

---

[10]The main standards provisions on radioactive lightning rods are those established in two Royal Decrees, RD 1428/1986, of June 13th, and RD 903/1987, of July 10th. There is also a series of applicable administrative resolutions, such as that of April 3rd 1990, authorising ENRESA to remove and transport lightning rods, or that of June 7th 1993 on the management of Americium-241.

[11]RD 208/2005, of February 25th, on electrical and electronic apparatus and the management of their wastes. Oficial State Gazette number 49 of February 26th 2005, pp. 7112 and following.

tive material that might appear beyond regulatory control. ENRESA responds to such calls by removing this type of sources or materials, which although of various types are not generally present in significant volumes.

d. *Metallic materials.* As a result of an incident involving the smelting of a radioactive source in a steelyard in 1998, the national authorities promoted the signing of the Protocol for collaboration in the radiological surveillance of metallic materials among those involved in this issue, including the MITYC, the CSN and ENRESA. Since that time there have been three other minor events of this type and a significant number of detections.

Section C

Scope of application

This section includes the requirements of article 3 of the Joint Convention on the scope of application.

Art. 3: Scope of application

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

The scope of application of the Convention in Spain shall cover the following:

1. Spent nuclear fuel arising from the operation of nuclear power plants and research and training reactors.
2. Radioactive waste from the nuclear fuel cycle, as well as wastes arising from the application of radioisotopes in industry, agriculture, research and medicine or as a result of past activities, incidents and accidents involving radioactive materials.

3. Waste materials from uranium mining installations and concentrates plants.
4. Discharges from nuclear and radioactive facilities.

Certain quantities of spent fuel have been sent abroad in the past for reprocessing, as a result of which the different products that are to be returned to the country shall be considered to be included in the scope of application.

Radioactive materials containing natural radioisotopes generated in practices unrelated to the nuclear fuel cycle are not included in the scope of application for the purposes of this Convention.

Spain is party to the Nuclear Weapons Non-Proliferation Treaty and does not have any radioactive wastes or spent fuel from military or defence programmes.

Section D

Inventories and lists

Art. 32. Reporting

(...)

2. This report shall also include:

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

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

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

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

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

b. has been disposed of; or

c. has resulted from past practices.

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

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

D.1.
Spent fuel management facilities

The spent fuel temporary storage installations currently existing are the pools associated with the nine operating NPP reactors and a facility for the dry storage of metallic

casks at the site of the Trillo NPP, the latter as a solution to the saturation of that plant's storage pool.

Table 3 lists the existing installations and their types.

✓ Pools

The spent fuel storage pools at the Almaraz I and II, Ascó I and II Cofrentes and Vandellós II plants are located in a building annexed to containment, the two areas being linked by the transfer channel. In the case of the Santa María de Garoña, José Cabrera and Trillo plants they are housed inside the reactor building.

The NPP's with two units, such as Almaraz and Ascó, have a separate fuel pool for each of their reactors. In the case of the Cofrentes plant there is also a pool in the reactor building that is used to temporarily store the fuel during refuelling periods.

The spent fuel storage pools whose initial capacity has been increased by the installation of high density racks have a reserve capable of housing a complete reactor core load, this being a requirement for NPP operation.

✓ The Trillo NPP spent fuel dry storage facility

a) Description of the facility

The Trillo NPP cask storage facility, which has been in operation since mid 2002, is a rectangular surface located shed capable of housing 80 casks. The interior of the facility is divided into two areas by means of a shielding wall: the Storage Area and the Access Area.

Table 3.
Spent fuel management facilities.

Name of the facility	Location (Province)	Type of storage	Characteristics of the facility
Almaraz I NPP	Cáceres	Pool	Integral part of the NPP
Almaraz II NPP	Cáceres	Pool	Integral part of the NPP
Vandellós II NPP	Tarragona	Pool	Integral part of the NPP
Asco I NPP	Tarragona	Pool	Integral part of the NPP
Ascó II NPP	Tarragona	Pool	Integral part of the NPP
Cofrentes NPP	Valencia	Pool	Integral part of the NPP
Sta. M. Garoña NPP	Burgos	Pool	Integral part of the NPP
José Cabrera NPP	Guadalajara	Pool	Integral part of the NPP
Trillo NPP	Guadalajara	Pool	Integral part of the NPP
		Dry storage facility	Newly constructed facility at the NPP site

- The Storage Area is equipped with a passive ventilation system and houses the storage casks, which are positioned vertically resting on a concrete slab.
- The Access Area is made up of the loading and unloading zone, the maintenance zone, the personnel access and control zone (including the control and electrical panels room, the instrumentation room, changing rooms, radiation protection post and decontamination room), the drains collection tank room and the auxiliary equipment, utensils and tools store.

The facility is equipped with a 135 Tm capacity cask handling gantry crane that runs along the entire length of the shed, with an auxiliary 10 Tm crane, and a radiation surveillance system, maintenance devices and other auxiliary systems.

The only component of the facility that fulfils safety functions is the spent fuel storage cask itself, for which reason the facility is designed as a passive building that ensures that the functions of the casks are not affected.

b) Description of the ENSA-DPT cask

The ENSA-DPT cask has been designed for the safe storage and/or transport of 21 Kraftwerk Union (KWU) 16x16-20 design basis light water reactor PWR fuel assemblies.

The design meets the requirements of 10 CFR 72, of the IAEA Safety Series No 6 and of the Spanish transport regulations. The essential characteristics of the cask are as follows:

- The cask is a multiple wall cylinder formed by two stainless steel wrappers, one internal and the other external, separated by a layer of lead that acts as the primary shielding against gamma radiation in the radial direction. The bottom of the cask is made up of two forged elements separated by neutron shielding material.
- It is fitted with a double closure head system with redundant seals at each of the penetrations that is designed to allow for the periodic verification of the leaktightness of the confinement barrier during storage and prior to transport of the cask following a period of storage where appropriate.
- The wrappers of the body of the cask are welded to the upper forged structure, in which are machined the seats for the inner and outer closure heads. Welded to the exterior of the outer wrapper is an annular recipient, formed by a polygonal surface with corresponding closure heads, inside which there are 36 radially arranged bimetal cooling fins, the spaces between them being filled with a solid synthetic polymer that acts as neutron shielding.
- Inside the rack, which is made of high strength stainless steel, there are twenty-one square cross-section tubes that house the fuel assemblies, supported laterally by stainless steel disks. The fuel tubes incorporate

neutron poison plates (borated aluminium with a content of B10 of 0.020 gr/cm2), these being fitted to the four faces of the central tubes and to three of the faces of peripheral tubes, in which the face oriented towards the outside of the cask is left without such plates.

Spent fuel management facility: temporary storage at Trillo NPP.

D.2. Spent fuel inventory

Table 4 shows the inventory of irradiated fuel in Spain as of December 31st 2004.

D.3. Radioactive waste management facilities

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

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

Table 4
Spent fuel inventory.

Name of the facility	Characteristics of fuel assemblies	Total capacity with reserve core (tU)	Number of fuel assemblies	tU
Almaraz I NPP	PWR 17x17	760	944	436
Almaraz II NPP	PWR 17x17	760	936	432
Vandellós II NPP	PWR 17x17	663	712	329
Asco I NPP	PWR 17x17	583	904	417
Ascó II NPP	PWR 17x17	583	820	378
Cofrentes NPP	BWR 8x8, 9x9	793	2736	509
Sta. M. Garoña NPP	BWR 8x8, 9x9	393	1636	291
José Cabrera NPP	PWR 14x14	127	292	78
Trillo NPP	PWR 16x16	294 (1)	528	247
		786 (2)	168	79

(1) *Plant storage pool.*

(2) *Dry storage facility (80 casks 9.8 tU/Ud).*

Given this definition, the "minor producers" are not included within the scope of this list of facilities, since their radioactive wastes are removed and processed by ENRESA at the El Cabril installations. Consequently, the radioactive waste management facilities are as follows:

✓ Operating NPP's

The NPP management facilities consist of treatment plants for liquid wastes, based on desiccation or immobilisation in cement, and other installations for the conditioning of solid wastes by compacting or immobilisation in cement.

The temporary storage facilities at the different plants are used as an intermediate step prior to the transport of the wastes to the El Cabril LILW disposal centre.

✓ Vandellós I NPP in the dismantling phase

The plant has an installation prepared in the reactor building pit for the temporary storage of low and intermediate level wastes generated during the dismantling process as a specific intermediate solution for the inventory of wastes that cannot be managed at the El Cabril facility.

✓ Juzbado fuel manufacturing facility

This facility has installations similar to those of the nuclear power plants, consisting of a treatment plant for liquid wastes, based on desiccation and immobilisation in cement, and other installations for the pre-conditioning of solid wastes by pre-compacting or their final conditioning by immobilisation in cement. As in the case of the NPP's, the temporary storage facility is used as an

intermediate step prior to the transport of the wastes to the El Cabril LILW disposal centre.

✓ CIEMAT (processing and temporary storage installations)

The CIEMAT IR-17 installation is authorised as a 2nd category radioactive facility and consists of three buildings: the conditioning sheds building (CIEMAT Building 33), the package store (Building 40) and the packaging and components manufacturing workshop (Building 41).

In accordance with its operating permit, the IR-17 facility may be used for the conditioning of low and intermediate level solid wastes produced by CIEMAT or managed by ENRESA. The permit also establishes that the materials that may be handled or stored are solid wastes belonging to IAEA categories 1 and 2 and encapsulated sources of categories 1, 2 and 3 (whose surface dose rate does not exceed 1Sv/h for maximum energies of 1.33 MeV) and 4. The facility may also receive and store sources of Ra-226 taken over by the Directorate General of Energy Policy and Mines of the MITYC.

The facility is also equipped with the systems required for the disassembly of radioactive lightning rod and ISD ion sources for subsequent conditioning. The CIEMAT also treats and conditions the secondary wastes arising from research activities carried out at the centre, relating mainly to radioactive waste characterisation methodology developments.

✓ El Cabril low and intermediate level waste disposal facility

The El Cabril centre has solid and liquid waste treatment and conditioning systems, including an incinerator and a compactor. These systems are used to suitably treat and condition all the wastes from the minor producers, as well as those generated at the facility itself, prior to their being introduced in the cells. It also possesses the systems required for the final conditioning of wastes from nuclear facilities, prior to their disposal in the cells.

➪ Treatment and conditioning of radioactive facility waste.

The El Cabril facility includes the systems and equipment required for the treatment and conditioning of waste from the minor producers.

Wastes generated by the minor producers are transported to the facility following a process of segregation carried out by the producer at his own installations, in accordance with the removal agreement in place between the producer and ENRESA in application of the waste category system established by the MITYC.

Treatment of the different types of wastes at the El Cabril facility is undertaken in a manner such that the production of secondary wastes is minimised and solid end products are obtained with fully guaranteed long-term stability.

For this purpose, the minor producer waste conditioning area has a glove box for the emptying of the containment units, a pre-compactor for compactable waste not posing any biological risk, an incinerator for those wastes for which this is the only possible management route (putrefying solids, solid with biological risk, scintillation liquids, oils and solvents) and an immobilisation area for the final wastes produced by

these treatments and for the direct immobilisation of radioactive sources and hypodermic syringes and solids with cutting edges.

➪ Final conditioning of wastes from major producers.

Within the scope of their responsibilities, the major producers (the NPP's and the fuel assembly manufacturing facility) are contractually obliged to condition their low and intermediate level wastes in order to produce packages meeting the ENRESA acceptance criteria.

The majority of the waste packages generated by these producers belong to the category of already conditioned wastes that are delivered to ENRESA for transport to the El Cabril facility in a manner, immobilisation in a cement matrix, that does not require subsequent treatment processes.

There is also a second category, made up of packages pre-compacted at the point of origin due to their physical characteristics.

The El Cabril facility possesses a drum compacting device with a capacity of 1200 t, which provides average volume reduction factors of around 3. The compacted units, or pellets, are inserted by means of a distribution system that places then in an orderly fashion inside a disposal container, prior to their being sent to the mortar injection line.

Both the unloading crane and the compactor and distribution system are operated semi-automatically from the Control Room.

Radioactive waste management facilities: view of El Cabril.

Radioactive waste management facilities: disposal of drums conditioned in containers (El Cabril).

Radioactive waste management facilities: disposal of containers in cells (El Cabril).

➪ Temporary storage at the El Cabril facility.

The El Cabril facility has two sets of installations that are used for the temporary storage of solid waste.

The "modules" are three buildings built during the 1980's for long-term temporary storage and are located at a distance of some 1800 m. from the final disposal area. Each has a rated capacity for 5.000 drums of 220 litres each. At present the process of identifying the units produced before 1992 continues, the aim being for them to be transferred to the cells once compliance with the acceptance criteria has been verified. These installations are also used to house heterogeneous and special wastes pending their subsequent treatment for final disposal.

The transitory reception building, located at the El Cabril facility itself, has an area for the buffer storage of waste packages.

➪ Definitive disposal at the El Cabril facility.

Once conditioned in their cement matrix, the wastes are transferred to the disposal containers with the help of a remotely controlled gantry crane. Once the container is full, it is transferred to the container handling shed by means of a cart. From here, and following placing of the lid, it is transported to the mortar injection station. It then returns to the container shed where it remains until the mortar injected has completely dried. On completion of the process the container is taken by truck to the disposal platform. Hoisting and positioning of the container in the cell is accomplished by remote control, the systems being operated from the control room.

Table 5 contains a list of the radioactive waste management facilities, including their location and main characteristics.

D.4. Inventory of radioactive waste

Table 6 shows the inventory of radioactive waste as of December 31st 2004. Mining and process tailings are showed in table 7.

D.5. Facilities in the decommissioning phase

✓ Vandellós 1 NPP

This French technology graphite-gas NPP is the only one if its type built in Spain and the only plant in the decommissioning phase, as defined in section b) of article 2 of the Convention.

The plant entered commercial service in 1972 and operated until October 19th 1989 when a fire broke out in its main turbine-alternator group. As a result of

this accident, the power operation of the plant was temporarily suspended by a Ministerial Order issued on November 27th 1989. Subsequently, it was agreed to shut down the plant definitively, by the Ministerial Order of July 31st 1990. The Resolution of the Directorate General for Energy of November 27th 1992 accepted the alternative proposed by ENRESA for the Dismantling and Decommissioning Plan (DDP), which established partial dismantling to IAEA Level 2 as the first objective. This Plan was submitted in May 1994, the favourable report from the CSN and Environmental Impact Statement being obtained in 1997 and authorisation for project performance in January 1998.

Table 5
Radioactive waste management facilities.

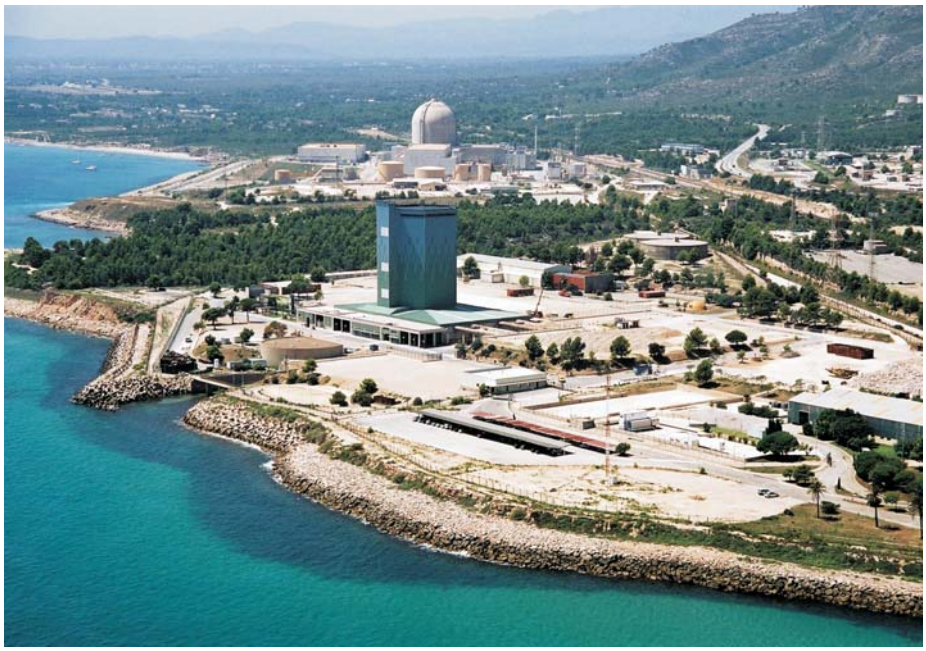
Name of facility	Location (Province)	Main purpose	Other characteristics
Almaraz I NPP	Cáceres	Treatment, pre-conditioning and temporary storage	Installations for management of the operating wastes generated at each of the nuclear power plants
Almaraz II NPP	Cáceres	Treatment, pre-conditioning and temporary storage	
Vandellós II NPP	Tarragona	Treatment, pre-conditioning and temporary storage	
Asco I NPP	Tarragona	Treatment, pre-conditioning and temporary storage	
Ascó II NPP	Tarragona	Treatment, pre-conditioning and temporary storage	
Cofrentes NPP	Valencia	Treatment, pre-conditioning and temporary storage	
Sta. Mª . Garoña NPP	Burgos	Treatment, pre-conditioning and temporary storage	
José Cabrera NPP	Guadalajara	Treatment, pre-conditioning and temporary storage	
Trillo NPP	Guadalajara	Treatment, pre-conditioning and temporary storage	
Vandellós I NPP	Tarragona	Temporary storage	Installations for the storage of part of the wastes arising from plant dismantling
Juzbado manufacturing facility	Salamanca	Treatment, pre-conditioning and temporary storage	Installations for management of the technological operating wastes generated at the facility
CIEMAT	Madrid	Pre-conditioning and temporary storage	Installations at the nuclear research centre
El Cabril facility	Córdoba	Temporary storage	3 concrete modules + transitory reception building
		Final disposal	28 near-surface reinforced concrete cells

Table 6
Inventory of radioactive waste.

Name of facility	Type of facility	Type of waste	Volume (m^3)	Activity (MBq)	Main radionuclides
Almaraz I NPP	NPP	LILW	1570	1,3E+09	Co-60, Cs-137
Almaraz II NPP	NPP	LILW			
Vandellós II NPP	NPP	LILW	300	5,1E+07	Co-60, Cs-137
Asco I NPP	NPP	LILW	630	1,0E+08	Co-60, Cs-137
Ascó II NPP	NPP	LILW			
Cofrentes NPP	NPP	LILW	1570	1,1E+08	Co-60, Cs-137
Sta. M. Garoña NPP	NPP	LILW	940	1,0E+08	Co-60, Cs-137
José Cabrera NPP	NPP	LILW	710	3,9E+07	Co-60, Cs-137
Trillo NPP	NPP	LILW	140	2,9E+05	Co-60, Cs-137
Vandellós I NPP	NPP	LILW	2980	2,8E+08	Co-60, Ni-63
Juzbado	Fuel assembly production facility	LILW	470	1,3E+05	U-234,U-235,U-238
CIEMAT	Research centre	LILW	10	——-	Am-243
El Cabril	LILW disposal facility	LILW	51170	2,0E+08	Co-60, Cs-137

Table 7
Mining and process tailings.

Facility	Location (province)	Mining tailings (x 106 t)	From beds (x 106 t)	From sludges (x 106 t)
Andújar Uranium Mill	Jaén			1.20
Lobo-G Plant	Badajoz	6.3		0.28
Elefante Plant	Salamanca		7.2	0.3
Saelices el Chico	Salamanca	68		
Quercus Plant	Salamanca		3,8	0.95



Facilities in the decommissioning phase: Vandellós I NPP.

Facilities in the decommissioning phase: view of the facilities of CIEMAT (Madrid).

On completion of Level 2, this facility has become a passive installation that will remain in this mode for the next 25 years (the dormancy period initiated in January 2005), until such time as complete dismantling is addressed.

The authorities are currently evaluating the methodology and the tests performed by ENRESA to release, from the regulatory point of view, the land that was part of the site and that is not required for the facility during the dormancy period.

✓ CIEMAT facilities

The decision to dismantle certain obsolete CIEMAT installations for which no future use was foreseen and take advantage of the space released for the performance of other activities led to the Integrated Plan for the Improvement of CIEMAT Facilities (PIMIC), in the preparation of which ENRESA collaborated as a specialist company with experience in this field of management.

The Plan, which will extend to the year 2007, is subject to CSN control and supervision, in accordance with the standards in force, and once the mandatory authorisations have been obtained from the Administration, CIEMAT will continue to be the licensee responsible for the installation and will provide the necessary support.

During 2004 the activities relating to the preparation and adaptation of the auxiliary, fire-fighting and electrical systems not subject to the aforementioned process of authorisation have been undertaken.

✓ Saelices el Chico mining exploitations

Work continues in this area on restoration of the mines that until the end of 2000, fed the ENUSA Quercus plant at Saelices el Chico (Salamanca), this project stretching from 2001 to 2008.

✓ Elefante plant

Work on the dismantling and restoration of the Elefante plant began in January 2001 and ended in December 2004. The licensee has submitted his surveillance and control programme for the period of compliance prior to decommissioning, which is now to begin. The programme is expected to last four or five years, up to the initiation of the surveillance programme deriving from the dismantling of the Quercus plant, as from which moment there will be a single programme.

Table 8 shows the Spanish facilities in the decommissioning phase.

D.6. Decommissioned facilities

Decommissioned facilicities are showed in table 9.

✓ Andújar Uranium Mill

Surveillance continues at the site of the Andújar Uranium Mill, in accordance with the conditions established in the set of requirements applied by the CSN, included in the Resolution of the Ministry of Industry and Energy of March 17th 1995.

✓ Arbi experimental reactor

The Arbi reactor (Labein Industrial Testing and Research Laboratories in Bilbao), of the "Argonaut" type, was dismantled throughout 2004. This reactor's decommissioning declaration was issued in June 2005.

✓ Argos experimental reactor

The Argos reactor installed at the University College of Industrial Engineering of the Polytechnic University of Catalonia, in Barcelona, was a heterogeneous thermal reactor similar to the Arbi unit. The objective of its dismantling project was to decommission the installations and free the site from all radiological restrictions, thus releasing it for other uses. The dismantling of the Argos reactor was completed in 2002, the decommissioning declaration being granted in 2003.

✓ La Haba mining exploitations and the Lobo G Plant

The programme for the restoration of the La Haba mining exploitations, consisting of four open cast mines and their associated rubble tips, was carried out as from 1990. The dismantling of the uranium concentrates plant (Lobo G Plant), with its leaching beds and tailings dykes, took place between 1995 and 1997. The Resolution of the Directorate General for Energy issued in January 1998 declared the dismantling and site restoration tasks to be completed and the period of compliance, established at a minimum 5 years, to be initiated.

Prior to completion of the period of compliance, the licensee submitted the corresponding request for the declaration of decommissioning of the facility, accompanied by a summary of the data acquired over the last two years, a list of the documentation to be kept and a long-term surveillance and control programme. Following verification by the CSN of fulfilment of the parameters relating to safety and radiation protection imposed by the Administration, the facility's decommissioning declaration was awarded via the Ministerial Order of the MITYC issued on August 2nd 2004. The area corresponding to the process tailings dyke remained subject to a long-term control programme, with

Table 8
Facilities in the decommissioning phase.

PROGRAMME	NAME	LOCATION	STATUS	PERFORMANCE
Project for the dismantling of Vandellós I NPP	Vandellós I	Vandellós, Tarragona	Dormancy (Dismantled to Level 2)	1998 - 2004
Integrated Plan for the Improvement of the CIEMAT Installations	CIEMAT	Madrid	Licensing and preliminary work	2004-2007
Decommissioning and Dismantling Plan for the Saelices el Chico facilities	Elefante	Saélices el Chico	Decommissioned and dismantled	2001- 2004
	Fé		In progress	2001- 2008
	Quercus		Shut down; dismantling plan being prepared	

Table 9
Decommissioned facilities.

PROGRAMME	NAME	LOCATION	STATUS	PERFORMANCE
Decommissioning and dismantling plan for the Andújar Uranium Mill	AUM	Andújar, Jaén	Decommissioned and dismantled	1991 – 1994
Argos experimental reactor	Argos	Barcelona	Decommissioned and dismantled	2002 - 2003
Arbi experimental reactor	Arbi	Bilbao	Decommissioned and dismantled	2004 - 2005
Decommissioning and dismantling plan for the La Haba facilities	Lobo G	La Haba, Badajoz	Decommissioned and dismantled	1990-1997
Restoration plan for disused uranium mines in the Autonomous Community of Andalusia	1. La Virgen	Andújar, Jaén	Restored	May 99 – March 00
	2. Montealegre	"	"	May 99 - July 99
	3. Navalasno	"	"	May 99 - Sept. 99
	4. Cano	Cardeña, Córdoba	"	July 98 – Dec. 99
	5. Trapero	"	"	July 98 – March 99
	6. San Valentín	"	"	July 98 – March 99
Restoration plan for disused uranium mines in the Autonomous Community of Extremadura	1. Pedro Negro	Alburquerque, Badajoz	Restored	April 99 – June 99
	2. Calderilla	"	"	Feb. 99 – May
	3. Viesgo II	Ceclavín, Cáceres	"	August 99 – Nov. 99
	4. Sevillana	"	"	"
	5. Valdellascón	Alburquerque, Badajoz	"	Jan. 99 – Sept. 99
	6. Carretona	Torremocha, Cáceres	"	Nov. 97 – June 98
	7. Ratones	Albalá , Cáceres	"	Febr. 98 – March 99
	8. Cabra baja	Villanueva del Fresno, Badajoz	"	Nov. 97 – June 98
	9. Broncana	Albalá , Cáceres	"	March 98 – June 98
	10. Gargüera	Tejeda del Tiétar, Cáceres	"	April 98 – Jan. 99
	11. Perdices	Albalá, Cáceres	"	Feb. 98 – Sept. 98
	12. El Sabio	Alburquerque, Badajoz	"	Jan. 99 – May 99
	13. Zafrilla	Casar de Cáceres, Cáceres	"	April 99 – Nov. 99
La Haba uranium mine restoration project	1. Pedregal	La Haba. Badajoz	Restored	1990 - 1997
	2. María Lozano	"	"	"
	3. Intermedia	"	"	"
	4. Lobo	"	"	"

restrictions on use. The surrounding areas were released for grazing or forestry, uses similar to that to which the land in the area is generally put.

✓ Restoration plan for disused uranium mining facilities

The Plan initially included the restoration of 24 sites at which mining activities had been carried out, either on the surface (in two cases only) or under ground, this also including buildings in certain cases.

This project, directed by ENRESA and performed by ENUSA, was approved in 1997 by the Ministry of Industry and Energy, following favourable reports from the CSN and the corresponding regional, provincial and local administrations. Work began in November 1997 and finished in March 2000.

Decommissioned facilities: view of the Andújar Uranium mill.

Section E

Legislative and regulatory system

Article 18
Implementing measures

Article 18. Implementing measures

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

The Nuclear Safety Council (CSN), in collaboration with the Ministry of Industry, Tourism and Trade (MITYC) and ENRESA, continues to work on the legal development of aspects relating to the management of waste and spent fuel.

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

Additionally, Directive 2002/96/CE of the European Parliament and Council, of January 27th 2003, on waste arising from electrical and electronic apparatus, has been transposed into national law, this including within its scope the management of ion smoke detectors as non-conventional waste. This aspect is dealt with also in Section E, Article 19 of this report.

Assessment of compliance

Although the legal development process foreseen has not yet been completed, the current legal framework for nuclear facilities is sufficient to guarantee safety in the management of spent fuel and radioactive waste at the currently existing facilities, in compliance with this article of the Joint Convention.

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 to govern the safety of spent fuel and radioactive waste management.

2) This legislative and regulatory framework shall provide for:

i) the establishment of applicable national safety requirements and regulations for radiation safety;

ii) a system of licensing of spent fuel and radioactive waste management activities;

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

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

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

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

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

In general terms, the Spanish Legal System as it relates to nuclear matters is characterised by the existence of a general law, the Nuclear Energy Act, law 25/1964, of April 29th (Span. *Ley de Energía Nuclear*, from hereon the LEN), complemented by laws, regulations and Ministerial Orders on specific aspects. The LEN establishes the basic structure of the regulatory system and the responsibilities of the main agents involved; defines basic safety principles and criteria; announces the procedures for the granting or cancellation of the administrative authorisations required; and establishes mechanisms for inspection, assessment and penalties to check that the licensees of the authorisations meet the requirements established in the legal and regulatory provisions. Furthermore, the LEN provides that the existence of any radioactive material or waste not under the responsibility of the authorised licensees shall immediately be reported to the competent authorities.

Annex A of this report includes a list of the provisions exclusively or tangentially regulating radioactive waste management in Spain, classified on the basis of their legal standing. For a detailed view of these provisions, the reader is referred to this Annex. Given its contents and the public character of the information it contains[12], we shall focus below on the most important novelties that have arisen in the Spanish nuclear Legal System since the publication in May 2003 of the first national report drawn up by Spain for the Joint Convention.

[12] *Information available on the website of the Oficial State Gazette: http://www.boe.es/g/eng/index.php.*

19.1. Main novelties in the legislation on spent fuel and radioactive waste management

Law 62/2003[13]

Certain aspects of the 1964 NEA have recently been modified. Thus, article 93 of Law 62/2003, of December 31st, on Fiscal, Administrative and Social Measures, modifies the LEN by introducing within its scope of application, in relation to the system of authorisations for nuclear facilities, nuclear devices and facilities for the development of new energy sources.

This same Law 62/2003 implies a modification to the 1980 Law by which the CSN was set up. This modification refers to the filing and custody of CSN documentation and affects the documentation to be submitted to the CSN by the licensees of NPP operating permits on the definitive interruption of their practices and prior to the transfer of ownership and awarding of the authorisation for the dismantling of their facilities.

Royal Decree Law 5/2005[14]

As regards the most recent development, the approval of RD-Law 5/2005, of March 11th, on Urgent Measures for the Promotion of Productivity and the Improvement of Public Contracting, has had major repercussions. An important part of this RD-Law refers to the necessary liberalisation of the electricity markets. In this respect, art. 25 of the said RD-Law modifies the Electricity Industry Act, Law 54/1997, specifically as regards everything relating to the financing of radioactive waste management activities.

As has been pointed out in Section B of this report, and is indicated in Section F (art. 22, Human and financial resources), the Fund for the financing of activities contemplated in the PGRR has to date received income from different sources – one of the most important being a fee charged against electricity billing-. As established in RD-Law 5/2005, as from April 1st 2005 the NPP licensees shall bear the costs attributable to their operation. The way in which the operators contribute to covering these costs is determined by the RD-Law itself: ENRESA bills these operators the sum resulting from multiplying the gross kilowatt-hours (kWh) generated by each NPP during each calendar month by a unit value specific to each plant, calculated on the basis of criteria such as remaining lifetime or the volume of wastes generated. The system is made more flexible by the fact that the said unit values are revised annually.

Another novelty introduced by this RD-Law is the acceptance by the Spanish State of the ownership of radioactive wastes once these have been definitively disposed of, as well as the surveillance required following the closure of nuclear or radioactive facilities, subsequent to the period established in the corresponding statement.

Royal Decree 1349/2003[15]

RD 1349/2003, of October 31st, on the Ordering of ENRESA's Activities and their Financing, merges into a single text all the various and previously disperse standards

[13] *BOE No 313 of December 31st 2003, pp. 46874 and following.*

[14] *BOE No 62 of March 14th 2005, pp. 8832 and following.*

[15] *BOE No 268 of November 8th 2003, pp. 39654 and following.*

applicable to radioactive waste management and to the dismantling and decommissioning of nuclear and radioactive facilities[16]. More than introducing substantive measures, this RD has served to facilitate compliance with the legislation by simplifying and unifying its formulation.

Royal Decree 208/2005[17]

RD 208/2005, of February 25th, on Electrical and Electronic Apparatus and the Management of their Wastes, transposes the Directives of the European Parliament and Council 2002/96/CE and 2003/108/CE, including ion smoke detectors within its scope of application.

Ministerial Order 1449/2003[18]

The MITYC has issued Ministerial Order 1449/2003 on the management of solid waste materials with radioactive contents generated at 2nd and 3rd category radioactive facilities at which non-encapsulated radioactive isotopes are handled or stored. As provided by this Order, materials of this type for which no further use is foreseen shall not be considered as radioactive wastes when they present contamination by radionuclides in concentrations or at levels of activity equal to or lower than those defined in its annex. In such cases, the management of these materials can be carried out in accordance with the standards applicable to them.

19.2. Novelties in the facility authorisation system

19.2.1. Authorisations required in the licensing of nuclear and radioactive facilities

Nuclear facilities are as defined in art. 11 of the Regulation on Nuclear and Radioactive facilities (RD 1836/1999, of December 3rd; Span. *Reglamento de Instalaciones Nucleares y Radiactivas*, from hereon the RINR):

a. Nuclear power plants,

b. Nuclear reactors,

c. Manufacturing facilities using nuclear fuels to produce nuclear substances and those at which nuclear substances are treated, including facilities for the treatment or reprocessing of irradiated nuclear fuels;

---

[16]The laws referred to in the said RD are Law 13/1996 of December 30th, on Fiscal, Administrative and Social Measures, in relation to the financing of costs deriving from the removal and management of radioactive lightning rod headers (art. 172), Law 14/1999, of May 4th, on Public Prices and Rates for the services rendered by the CSN, in relation to the possible financing of the management of radioactive waste generated in certain exceptional circumstances (second additional provision) and Law 24/2001, of December 27th, on fiscal, administrative and social measures, in relation to the Fund for the financing of the activities contemplated in the GRWP (fourteenth additional provision).

[17]BOE No 49 of February 26th 2005, pp. 7112 and following.

[18]BOE No 134 of June 5th 2003, pp. 21840 and following.

d. Facilities for the storage of nuclear substances, except those places at which such substances are stored incidentally during transport.

Radioactive facilities are as defined in art. 34 of the RINR:

a. Those containing a source of ionising radiations;

b. Apparatus producing ionising radiations and operating at a differential potential of more than 5 kV;

c. Premises, laboratories, manufacturing facilities and installations at which radioactive materials are produced, used, held, treated, handled or stored, except those at which such materials are stored incidentally during transport.

These facilities are divided into three categories, taking into account their exempt activity per nuclide, as established by the Law by which the CSN was created.

The main stages within the system of licensing of nuclear and radioactive facilities in Spain are as follows:

1. Preliminary or site authorisation. This is necessary for all first category nuclear and radioactive facilities and constitutes official recognition of the objective proposed and the site selected. Awarding of this authorisation allows the licensee to apply for the construction permit for the facility and to initiate preliminary infrastructure works.
2. Construction permit. This is necessary for all first and second category nuclear and radioactive facilities. During the construction and assembly of the nuclear facilities, and prior to loading fuels or accepting nuclear substances at the installation, the licensee of the permit is obliged to carry out a programme of pre-nuclear tests accrediting the suitable performance of the equipment or parts making up the facility as regards both nuclear safety and radiation protection and the applicable industrial and technical regulations.
3. Operating permit. This authorisation, which is applicable to nuclear facilities, is granted in two phases:
    a. a provisional authorisation (Operating Permit), for the licensee to carry out a programme of nuclear tests and, depending on the results of such tests,
    b. a definitive authorisation (Definitive Operating Permit), allowing the licensee to operate the facility in accordance with its technical characteristics and the restrictions arising as a result of the nuclear testing programme.
4. Authorisation for modifications. This authorisation, applicable to all types of facilities, allows the licensee of the facility to carry out the modifications required and affecting the design, operating conditions or radiation protection, on the basis of operating experience. This authorisation requires certain arrangements similar to those required in the case of the previous authorisation.
5. Decommissioning permit. Also applicable to all types of facilities, this authorisation allows the licensee to carry out all the actions necessary at the end of the service lifetime of the installation to free the site on which it is located from subsequent radiological controls.

Annex B of this report includes detailed information on the steps required for the licensing of nuclear and radioactive facilities, the accompanying documents, the responsible authorities and agents, etc.

19.2.2. Significant modifications to the licensing system

The RINR establishes that nuclear power plant operating permits are awarded for a period that is fixed in the permit itself. In compliance with the guidelines established in the CSN Strategic Orientation Plan, the permits are generally being awarded for a period of ten years, coinciding with performance of the periodic safety reviews.

A Safety Study is performed following each refuelling outage in order to incorporate the modifications introduced at the facility and update the study contents. Up to recently, this Safety Stude had to be approved by the MITYC following a favourable report by the CSN. This approval is now necessary only for revisions deriving from design modifications requiring authorisation prior to their implementation. In these cases, the revision of the Safety Study is approved simultaneously with the design modification and with the other official operating documents affected, such as the Operating Technical Specifications.

Likewise, the RINR sets out the system for the licensing of design modifications, establishing the obligation of the licensee to analyse modifications prior to their being implemented and specifying that approval is required for those that alter the criteria, standards or conditions on which authorisation of the facility is based. These concepts are dealt with in CSN Complementary Technical Instructions and in a CSN Safety Guide (GS-1.11, *Design modifications at nuclear power plants*), approved by the CSN in July 2002 following a period of application of a preliminary version dating from 1998. The new instructions and the new version of the guide have taken into account the modifications introduced in the USNRC's 10 CFR 50.59. In addition, the RINR contemplates an authorisation for construction and assembly for modifications of a major scope or implying significant construction and assembly works.

19.3. Nuclear and radioactive facility inspection and assessment system

One of the functions of the CSN, as established in the law[19], is the inspection of nuclear and radioactive facilities from the point of view of nuclear safety and radiation protection. These inspections, which are carried out periodically, are aimed at ensuring that the operation of such facilities does not pose undue risks for people or for the environment, and that the applicable operating conditions – both general and specifically established for the facility - are fulfilled. For this purpose, both the CSN inspectors and the personnel of the MITYC, in their respective realms of competence, have been given the authority to access the facilities and documents and to witness the tests requested in exercising their tasks. Likewise, the results of each inspection are included in a report.

[19]*The functions of the CSN are specified in the Law by which it was created (Law 15/1980), partially modified by the law regulating the National Electricity Industry, Law 40/1997, of December 30th, and by Law 14/1999 on Public Prices and Tariffs for services rendered.*

Such activities are complemented with assessments and tracking through the checking of data, reports and documents submitted by the licensee, and are reinforced by the possibility of requesting more information, issuing warnings or requirements to the operators and even proposing to the MITYC that sanctions proceedings be initiated.

19.4. System of penalties applicable to nuclear facilities

The system of penalties applicable to nuclear facilities is contained in chapter XIV of the LEN[20] and establishes a series of fines that vary depending on the seriousness of the infringement in question. Within this system the CSN is responsible for initiating sanctions proceedings, which are completed by the Government through application of the penalty it considers to be appropriate.

Specifically, the functions performed by the MITYC are of instruction and resolution of sanctions proceedings, while the final application of the penalty is undertaken by the Cabinet in the case of very serious infringements, by the MITYC itself in the case of serious infringements and by the Director General for Energy in the case of minor infringements.

19.5. Assignment of responsibilities

Section B (sub-section two) of this report, Policies and Practices, describes the role of the different agents involved in radioactive waste management in Spain.

Royal Decree 1522/1984 authorised the constitution of ENRESA for management of the radioactive wastes generated in Spain and for the dismantling of nuclear and radioactive facilities. Currently regulating the functions of ENRESA are RD 1349/2003, of October 31st, on the ordering of ENRESA's activities and their financing, to which are added the provisions of RD 5/2005 on urgent improvements, as regards financing. Given that these are recently written provisions that modify previous ones, their contents have been underlined in sub-section 19.1. of this same section.

Art. 4.1. of RD 1349/2003 establishes ENRESA's functions:

a) To treat and condition radioactive waste

b) To select sites and design, construct and operate centres for the temporary storage and definitive disposal of radioactive waste.

c) To establish systems for the removal, transfer and transport of radioactive waste.

d) To adopt safety measures in radioactive waste transport in accordance with the specific regulations on the transport of hazardous goods and with the determinations of the competent authorities and organisations.

e) To manage operations relating to the dismantling and decommissioning of nuclear and radioactive facilities.

[20] *Wording of the Fifth Additional Provisión of the Electricity Industry Act, Law 54/1997, and by the Fifth Additional Provisión of Law 14/1999 on Public Prices and Tariffs.*

f) To act, in the event of nuclear or radiological emergencies, in support of the national civil defence system and the security services, in the manner and under the circumstances required by the competent organisations and authorities.

g) To definitively and safely condition tailings originating from the mining and milling of uranium concentrates, in the manner and under the circumstances required by the competent organisations and authorities, with consideration given where appropriate to the plans and forecasts of the operator.

h) To establish systems guaranteeing the safe long-term management of its radioactive waste disposal facilities.

i) To establish the research and development plans necessary for the performance of its missions.

j) To carry out the necessary technical and economic-financial studies, taking into account the deferred costs deriving from its functions, for establishment of the corresponding economic requirements.

k) To manage the Fund for the financing of activities included in the General Radioactive Waste Plan, in accordance with the provisions of the said RD.

l) Any other activity required for the performance of the missions described above.

The aforementioned RD likewise establishes that ENRESA shall be obliged to draw up and submit to the MITYC the following (art. 6):

a) A revision of the PGRR every four years, or whenever requested by the said Ministry, this to include the following:

   - The necessary activities and technical solutions to be undertaken during the timeframe of the plan, aimed at ensuring the adequate management of radioactive waste and dismantling and decommissioning of nuclear – and where appropriate radioactive – facilities.
   - The economic and financial measures required for performance of what is established in the previous paragraph.

b) During the first six months of each year:

   - A report including the technical and economic aspects of activities performed during the previous year, and a comparison with the corresponding budget.
   - An updated economic-financial study of the cost of the activities contemplated in the PGRR, including compensation for the management activities of the plan and the suitability of the financial mechanisms in force.

c) Prior to November 20th of each year, a technical-economic justification of the suitability of the annual budget corresponding to the next year, and of its projection for the three following years, with respect to the contents of the updated economic-financial study of the cost of activities contemplated in the PGRR. In the exceptional event of costs not contemplated in the aforementioned economic-financial study having to be faced, the corresponding justification of such costs should be provided.

The above makes up the legal framework regulating the assignment of responsibilities for the management of radioactive waste and spent fuel in Spain, in relation to realms of competence and financial issues.

19.6. Assessment of compliance

From the information included in the previous sections it may be deduced, as has been indicated, that Spain, although lacking a specific legislative framework aimed exclusively at regulating the management of the spent fuel and radioactive waste generated in its territory, possesses sufficient legislative elements to guarantee the correct practical treatment of its radioactive waste.

Article 20
Regulatory body

Article 20: Regulatory body

1. *Each Contracting Party shall establish or designate a regulatory body entrusted with the implementation of the legislative and regulatory framework referred to in Article 19, and provided with adequate authority, competence and financial and human resources to fulfil its assigned responsibilities.*
2. *Each Contracting Party, in accordance with its legislative and regulatory framework, shall take the appropriate steps to ensure the effective independence of the regulatory functions from other functions where organizations are involved in both spent fuel or radioactive waste management and in their regulation.*

20.1. Authorities responsible for application of the legislative framework

In Spain the regulatory function relating to nuclear safety and radiation protection is undertaken by various authorities.

- ✓ The *Government i*s in charge of energy policy and of dictating mandatory regulatory standards.
- ✓ The *Ministry of Industry, Tourism and Trade (MITYC)*[21] adopts agreement and binding decisions as regards the issuing, modification, suspension or cancellation of authorisations for nuclear facilities, and may impose penalties on those infringing the legal standards. Subject to the mandatory and, where appropriate, binding report by the CSN[22], it grants the different authorisations

[21] *The Ministry of Industry, Tourism and Trade was created by RD 553/2004, dedicated to the restructuring of ministerial bodies. As a result of Royal Decree 1554/2004, of June 25th, which develops the basic organic structure of the Ministry of Industry, Tourism and Trade, certain areas of competence previously corresponding to the Ministry of Economy became functions of the Ministry of Industry, Tourism and Trade.*

[22] *The CSN report is binding if negative or conditioned.*

and permits for nuclear facilities. Particularly significant among its functions is the capacity to adopt regulatory Provisions in enactment of the Parliamentary Laws and Government Regulations.

The structure of the MITYC was established by Royal Decree 562/2004, and is made up of the following governing and management bodies:

- The Secretariat General for Energy
- The Secretariat of State for Tourism and 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 basic organic structure of the MITYC is established by Royal Decree 1554/2004. This establishes that the Secretariat General for Energy reports to the Directorate General for Energy Policy and Mines, in which is integrated the Sub-Directorate General for Nuclear Energy, which carries out functions relating to radioactive waste and spent fuel, and therefore to the Convention.

Section L, Annex F of this report includes the organisational flowchart of the MITYC, highlighting those bodies that have attributed to them functions relating to the Convention.

✓ In accordance with the provisions of Royal Decree 1349/2003 on the ordering of *ENRESA's* activities and their financing, this enterprise shall draw up and submit to the MITYC every four years, or whenever required by the latter, a revision of the PGRR including the necessary actions and technical solutions for compliance with its purposes, along with the economic and financial forecasts for their performance. Likewise, during the first six months of each year it shall submit a report on the activities performed during the previous year and an updated economic-financial study of the cost of the activities contemplated in the PGRR. Also, prior to November 30th of each year it shall draw up a technical-economic justification of the budget for the following year and of its projection for the three subsequent years. Section L, Annex F includes the ENRESA organisational flowchart.

✓ The *Nuclear Safety Council (CSN)* is the sole competent authority for nuclear safety and Radiation Protection. It is independent from the Government and reports on its activities to Parliament.

The functions and responsibilities of the CSN have not been substantially modified in the last three years. For this reason, work continues in accordance with the legislative changes that took place in previous years, which significantly altered the functional and competence-related framework of the CSN.

- As regards the radiation protection of the environment, the CSN controls and monitors radiological quality throughout Spain, and not, therefore, only in the areas surrounding the facilities.

- In relation to radioactive waste, the CSN intervenes in controlling management and may even, in highly specific circumstances, propose the declassification of low and intermediate level wastes.

- In emergency situations, the CSN coordinates all the resources required for compliance with functions included within its realm of competence.

- Furthermore, the CSN approves technical standards and is empowered to issue favourable reports on new designs and methodologies, as well as to issue warnings to the licensees and propose corrective measures and, where appropriate, impose monetary sanctions.

- Finally, the CSN is responsible for regulating companies in the area of radiation protection.

The RINR unified the general contents of the authorisations and brought their provisions into harmony with those of other general standards. Functions are derived for the CSN from this Regulation, such as participation on the Information Committees, made up of representatives of the Government, the Autonomous Community, the municipal areas housing NPPs and the plant itself. These committees are responsible for informing different organisations of the performance of the regulated activities.

Other significant issues that have affected the missions and responsibilities of the CSN refer to the creation of a register of nuclear substances and radioactive materials transport companies and to regulation of the approval of new designs and methodologies. Furthermore, the CSN has been assigned missions relating to public information and the courses of action to be taken in the event of an emergency.

The reinforcing of certain CSN areas of activity and the need to address the new missions, especially in relation to environmental radiological surveillance and to coordination and response to situations of radiological emergency, have entailed the need to introduce certain changes in the Council's organic structure. The aim of these changes is to achieve a better adaptation of the existing resources to the new needs requiring specific attention, with organisational separation of matters relating to the safety of nuclear facilities from those concerning radiation protection.

The organic structure of the CSN has not been modified with respect to the previous Report and is shown in Annex F of this report.

20.2. Regulatory novelties at the CSN

During 2004 the CSN has completed the drawing up of the *Strategic Plan 2005 – 2010.* Taking into account the conditions currently existing in the environment and those expected to exist in the future, this Plan establishes the results to be obtained, the strategies and the objectives for the coming five years.

Another of the projects contemplated in the *Action Plan* for modernisation of the operation of the Organisation is re-engineering of the processes, which has been completed during 2004. The conclusions and recommendations were submitted to the Council in September of that year and are now in the phase of implementation.

A new planning model, supported by a new computer application, has been designed and implemented. The main objectives of the new model are to achieve greater integration between the strategy of the body and its day to day activities and simplify the planning documents (plans and tracking reports).

As a result of work relating to data protection, the resolution of the Council regulating automated files containing personal information has been updated.

Improvement of the regulatory process

During 2004 noteworthy progress has been made in improving the efficiency of the regulatory process through performance of the activities approved within the framework of the improvement tasks identified. The draft improvement tasks are currently undergoing the process of comments and approval. Mention may be made of tasks such as *CSN Policies, Standards pyramid and licensing bases, Adaptation of the Reactor oversight process (ROP) in the integrated plant supervision system (IPSS), Assessment process, quality of documents and Exemptions guideline,* as well as other specific tasks such as the *Programme for the identification and resolution of problems* and the *Corrective actions programme.*

Planning and tracking

A new planning model has been designed and implemented in 2004. The model considers planning to be a continuous process in which, starting from a set of strategic objectives, operational objectives are mapped out and compliance with and the validity of both are continuously assessed.

Strategic planning is designed for long-term compliance with the general goals of the Body (*Mission and Vision*), their different elements being looked upon as a whole. Operational planning applies and develops the strategic plans in daily activity, formulating short-term plans. The cycle is closed through measuring and assessment, allowing possible deviations to be identified and measures to be taken to correct them.

The drawing up of the strategy and the definition of strategic objectives are carried out for five-year periods. The strategies and associated objectives are included in the Strategic Plan, which is approved by the CSN. Every year the CSN establishes action policies (although these may be updated in the interim if required by changes in circumstances), these being set out in a resolution of the Secretary General that includes instructions for the preparation of the *Annual Work Plan (AWP).*

Finally, it is necessary to establish parameters and standards providing the data required to check whether the results obtained coincide with those mapped out, if the time periods established are being met and if activities are being performed to the necessary levels of quality. The tool used for measurement and assessment is the integral

command panel, which is to be implemented at the CSN and which is based on and extends the current command structure.

Internal Quality Plan

During 2004, 6,515 hours have been dedicated to internal quality and 10,259 to planning, these figures representing 1.74% and 2.75%, respectively, of the available hours.

As of December 31st there were 89 procedures approved, 27 relating to management, 13 administrative and 49 technical. Four procedures were approved during 2004.

The technical directorate for nuclear safety (DSN) has submitted 11 procedures pertaining to the *Integrated Plant Supervision System (IPSS)* to the internal quality department (CALI) for them to be adapted to the CSN documentary system.

The audit performed to verify compliance with the *Regulation on security measures* in relation to personal data has been satisfactorily completed, and the *Process re-engineering* project has also concluded.

Information systems plan

A new activities planning and management system has been developed and implemented as part of the implementation of the new planning model. The system is based on the Microsoft EPM tool.

An *Electronic administration* system has been developed that allows radioactive facility fees to be paid telematically, along with another system that allows nuclear facility documentation to be submitted via telematic means (telematic registration).

As part of the work relating to the training plan, a new application operating on the CSN Intranet has been developed and implemented. The application allows course requests and evaluations to be performed on line, using Web formats.

In order to allow the CSN offices to be extended, it has been necessary to install and configure the local network for the new facility and connect it to the CSN headquarters building. An optical link based on laser technology has been installed for this connection.

Training plan

The activities foreseen in the CSN Training Plan have been performed throughout 2004, and at the beginning of this year the Council approved the setting up of a Training Commission with the following objectives: drawing up of the training plan tracking criteria and methodology, monitoring and evaluation of the results of training activities performed in the current year and development of criteria for the design of the Training Plan for 2005 and subsequent years.

The Commission has performed the activities required to achieve these objectives, with special emphasis – given its relevance - on designing of the Training Plan for 2005.

The design of this plan has been carried out for the first time in accordance with the strategic objectives, as defined in the CSN Strategic Plan, thus facilitating and empowering compliance with the CSN Mission and Vision.

The training efforts made by the Council have been oriented, on the one hand, towards providing and updating knowledge in the areas of nuclear safety and radiation protection and the development of management and administrative skills and, on the other, towards specific English, French and German language teaching programmes and training processes on the use of computer tools and resources by the CSN personnel.

20.3. Assessment of compliance

From what has been set out in the previous sections, it may be deduced that the Spanish State fulfils the obligations contained in Article 20 of the Convention.

Section F

Other safety-related provisions

Article 21
Responsibility of the licence holder

Article 21. Responsibility of the licence holder

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

Section 1 of this article is generally applied in Spain since, as has been explained in previous chapters, all activities relating to radioactive waste or spent fuel require the corresponding authorisation. This authorisation or licence is awarded to the so-called licensee, who is assigned the responsibilities described below. In the case of historic wastes or other non-regulated materials (e.g., scrap), specific measures are applied (see section J, art. 28, Disused sealed sources).

21.1. Responsibility of the licence holder in relation to safety

The Spanish regulations establish as a basic principle that the prime responsibility for the safety of waste management facilities is to the licence holder.

The legal precepts assigning responsibility to the licensee of the facilities are included in the LEN and the RINR. As regards coverage of the risk of nuclear damage, the said licensee is likewise established as being responsible for the safety of the facility.

The LEN defines the operator of a nuclear facility as being the natural or legal person holding the authorisation required for its start-up.

The RINR in force establishes that, in order to obtain the different authorisations, the applying party should identify the organisation foreseen for supervision of the project and to guarantee quality during subsequent phases of the facility. It also requires that a detailed description of each of the posts in the operator's organisation be provided, along with the responsibilities assigned to each in relation to nuclear safety and radiation protection, and that the organisation foreseen for the future operation of the facility be described and a preliminary operating personnel training plan be submitted.

Article twenty-five of Royal Decree Law 5/2005, of March 11th, on Urgent Reforms for the Promotion of Productivity and the Improvement of Public Contracting, "Fund for the financing of activities included in the General Radioactive Waste Plan", modifies the Electricity Industry Act, Law 54/1997, of November 27th, establishing that the State shall assume the ownership of the radioactive wastes once they have been definitively disposed of. The State shall likewise be responsible for whatever surveillance might be required following the decommissioning of a nuclear or radioactive facility, after the period of time established in the corresponding statement of closure.

21.2. Liability for nuclear damage

Important novelties have arisen in this field: on February 12th 2004 Spain, Signatory to the Convention on civil liability for nuclear damage of 1960 (Paris Convention) and of the 1963 Convention complementary to it (Brussels Convention), signed an important modification to both. These modifications are currently in the process of ratification.

The modification implies an important reform of the system of civil liability for nuclear facilities, since among other modifications:

- ✓ It significantly increases the sums established as the minimum coverage to be provided by the responsible party, from 150 to 700 million euros in the case of nuclear facilities and from 6 to 70 million euros in the case of low risk nuclear facilities such as El Cabril;
- ✓ It includes within its scope of application other States that are not Signatories to the Convention (although in this respect various countries, among them Germany and Spain, have presented a reservation regarding the sum in application of the reciprocal arrangement with the signatories of the Vienna Convention, in force in most of Eastern Europe and Russia);
- ✓ It considerably increases the period for the submittal of claims for personal damage, from 10 to 30 years;
- ✓ The definition of nuclear damage extends also to environmental damage, in keeping with the "polluter pays" principle.

21.3. Regulatory control activities

Regulatory control is carried out fundamentally through the assessment and inspection activities performed by the CSN. Article 19 (Legislative and regulatory framework) of Section E of this report includes information on these activities.

In this context, and with a further-reaching objective than that referring to responsibilities in waste management, the CSN has issued its safety guide GSG-1.13, "Content of nuclear power plant operating regulations". The objective of this guide is to define criteria standardising the contents of the operating regulations of the installations in operation, since firstly there were previously significant differences between the contents of the regulations of the different facilities and, secondly, the effects of the liberalisation of the electricity industry underline the importance of the tracking and control of organisational changes at nuclear facilities.

The requirement established by the CSN obliging the plant licensees to analyse, justify and document all reductions in the personnel performing safety-related functions at the facilities remains in force, even though such reductions might not require previous authorisation due to their not implying changes to the Operating Regulation in force at the facility in question.

21.4. Assessment of compliance

In Spain there is a regulatory framework that clearly assigns to the licensee the responsibility for activities relating to the safety of nuclear and radioactive facilities, including those concerning spent fuel and radioactive waste management. Also established are the corresponding measures to cover liabilities for nuclear damage. The regulatory body carries out surveillance and control activities to ensure the maintenance of the licence conditions. Consequently, Spain is considered to suitable meet the obligations of this article.

Article 22
Human and financial resources

Article 22. Human and financial resources

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

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

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

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

22.1. Availability and qualification of human resources

The availability of adequate human and financial resources is a key issue for the maintenance of safety conditions at nuclear facilities. The RINR, which regulates the system of administrative authorisations for both nuclear and radioactive facilities and for other specific activities relating to the application ionising radiations, establishes requirements regarding the organisations to be submitted by the licensee in the different authorisations and personnel licences and accreditations. (Preliminary, construction and operating permits).

✓ Internal personnel organisation

In the application for operation, the Operating Regulation of the facility sets out the licensee's organisation, including the functions and responsibilities of

all job posts relating to nuclear safety and radiation protection. Any modification 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.

This section on organisation is also required to define the basic initial and on-going training programmes for licensed and non-licensed personnel, establishing the technical competence for each specific mission and the on-going training programmes considered adequate. Likewise, the Site Emergency Plan establishes the responsibilities and the human resources required to address emergency situations.

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

✓ Personnel qualification

The RINR establishes that occupying the posts of Head of Radiation Protection Service, Supervisor and Operator of nuclear or radioactive facilities requires the job incumbent to hold a specific licence. Each such licence is personal, empowers the holder to carry out work at a given facility and is awarded by the CSN following an examination designed to establish the competence of the candidates and set by a pannel appointed by the CSN[23], to undertake responsibility for the corresponding technical unit or service or occupy the post of Head of a Radiation Protection Service.

Once the facility is in operation, the CSN performs periodic inspections aimed mainly at checking the academic background, experience and training required for each job post, the basic training on radiation protection of all the workers and the scope of the on-going training programmes and whether these cover changes to the standards, design modifications and relevant operating experience. The licensees are required to submit to the CSN an annual report summarising the main initial and on-going training activities carried out with respect to their personnel related to nuclear safety or radiation protection.

Currently, a two-year programme of inspection of these training programmes for in-house and external licensed and non-licensed personnel allows a high degree of confidence to be maintained as regards the licensees' training activities.

✓ Qualification of ENRESA personnel

The specific responsibility for the management of radioactive waste and the decommissioning and dismantling of nuclear facilities in Spain was assigned to ENRESA in 1984, by the Royal Decree by which the company was set up. ENRESA possesses an organisation and a workforce that allows it to undertake the management programmes established in the General Radioactive Waste Plan (PGRR) approved by the Government. As of December 31st 2004, ENRESA had a workforce of 264 persons, of which 146 work at the Madrid headquarters, 116 at the El Cabril low and intermediate level radioactive waste

[23]Documentary basis: CSN Safety Guide 1.1. Qualifications for the acquisition and use of NPP operating personnel licences; and 7.2. Qualifications to obtain recognition as an expert in protection against ionising radiations.

centralised disposal facility and 2 at the site of the Vandellós I NPP dismantling and decommissioning project.

As the operator responsible for these installations, ENRESA is also subject to the system of authorisations and controls deriving from the aforementioned regulations.

22.2. Availability of financial resources

The national scheme for the management of radioactive waste and spent fuel includes not only a clear assignment of responsibilities but also a financing system allowing compliance with these responsibilities to be addressed.

As has been indicated in Section A of this report, and as is also explained in Section E, article 19 (legislative and regulatory framework), the regulation on funds for the financing of the activities contemplated in the PGRR has recently undergone important changes. These come about specifically through RD 1349/2003, on the Ordering of ENRESA's Financial Activities, and RD-Law 5/2005, on Urgent Measures for the Promotion of Productivity and Improvement in Public Contracting.

As a result of these reforms, the financing scheme in force establishes the creation of a Fund for the financing of the activities contemplated by the PGRR, the income for which will come from the channels indicated below, including the financial yield generated by them:

a) As from April 1st 2005, billing to the licensees of nuclear power plants of the amounts resulting from multiplying the gross kilowatt-hours (kWh) generated by each by a unit value specific to each plant, these values being established by the MITYC and possibly revised each year by Royal Decree on the basis of an updated technical-economic report on the corresponding costs.

b) The amounts collected by way of tariffs on supply to end clients and access tariffs, resulting from the application of percentages on electricity sales.

c) The amounts collected for the management of radioactive wastes arising from the manufacturing of fuel assemblies and from the dismantling of fuel assembly manufacturing facilities. In this respect, the mechanism established is one of annual contributions throughout the service lifetime of the facilities, such that these payments plus their corresponding financial yield cover the costs foreseen for these activities according to the estimates of the PGRR.

d) The result of billing, through tariffs approved by the Ministry of Industry, Tourism and Trade, for rendering of the radioactive waste management service to the operators of radioactive facilities generating radioactive waste in the fields of medicine, industry, agriculture and research.

e) Any other channel for revenues not contemplated in the previous paragraphs.

In general, transfers to the Fund may only be invested in expenses, work, projects and fixed assets arising from activities contemplated by the PGRR. In exceptional circumstances, however, management of the radioactive waste generated may be charged to the financial yield integrated in the Fund when the cost of such management cannot be

applied in accordance with the standards in force and when so determined by the MITYC.

On conclusion of the period for the management of radioactive waste and the dismantling of facilities contemplated in the PGRR, the total amounts transferred to the Fund via the different financing channels should cover the costs incurred, such that the final resulting balance be zero.

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

As part of its obligations arising from R.D. 1349/2003, on the ordering of its activities, ENRESA is obliged to submit to the MITYC each year an updated economic-financial report on the cost of the activities contemplated in the PGRR, which shall also consider the suitability to such cost of the financial mechanisms in force.

In addition to this annual presentation, this aspect is subject to the PGRR revisions or reports performed every four years.

22.3. Assessment of compliance

The Spanish regulatory framework provides for the availability of qualified personnel for activities relating to safety throughout the operating lifetime of nuclear and radioactive facilities, including the management of radioactive waste and spent fuel. Furthermore, there is a clear financing scheme in place that provides for the performance of the activities required for the construction, operation, decommissioning, dismantling and institutional surveillance of radioactive waste and spent fuel management facilities. As from April 1st 2005, a system of direct financing by the NPP operators has been introduced. Consequently, Spain is considered to meet the requirements of art. 22 of the Convention.

Article 23
Quality assurance

Article 23: Quality assurance

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

23.1. Quality assurance programme in the management of spent fuel and radioactive waste

Installations used for the storage of nuclear substances, except those for incidental storage during transport, are considered nuclear facilities. Consequently, the centralised disposal facilities for low and intermediate level radioactive waste are treated as

nuclear facilities, as a result of which a quality assurance programme is required to be applied to the different phases of their life cycles.

Activities relating to the management of spent fuel and radioactive waste at the nuclear facilities themselves are included within the scope of the quality assurance programmes applicable to the operation of these facilities.

Other activities that lead to the generation of radioactive waste are those associated with the decommissioning of nuclear and radioactive facilities involved in the nuclear fuel cycle, which also require a quality assurance programme approved by the administration.

Spain does not currently have a centralised spent fuel storage facility, as a result of which the fuel is stored at the nuclear power plants themselves and, as has been pointed out above, its management is included within the scope of the quality assurance programmes applicable to their operation. The same occurs in relation to the management of the solid, liquid and gaseous radioactive wastes generated during operation.

Spain has the centralised disposal facility at El Cabril for solid low and intermediate level radioactive waste. This installation is classified as a nuclear facility and as such is subject to quality assurance programmes.

The Vandellós I nuclear power plant, the Elefante plant for the treatment of natural uranium concentrates and the installations of the CIEMAT research centre, which are in different phases of decommissioning, have quality assurance programmes subject to approval by the CSN. Quality assurance programmes and quality plans have also been developed for the design and manufacturing of spent fuel casks. Given that they are located within the perimeter fence of the nuclear power plants, the quality assurance programme applied to the storage facilities for these casks is that of the plants in question.

The philosophy and requirements of the quality assurance programme are included in the Quality Assurance Manual, which in the corresponding authorisations is considered to be an official document whose compliance is obligatory. This document requires approval by the regulatory authority.

The licensee of the facility may introduce modifications in the Quality Assurance Manual, under his own responsibility, as long as such changes do not reduce the commitments contained in the quality assurance programme in force. Any changes reducing such commitments must be approved by the CSN prior to their entry into force.

Commitments are understood as being those included in the Quality Assurance Manual in force in the form of applicable standards and guidelines, along with the description of the programme itself reflected in the contents of the Manual, as specified in the complementary technical instructions issued by the CSN.

Revisions of the Quality Assurance Manual should be submitted to the CSN within one month of their entry into force.

The licensee of the facility is responsible for ensuring that a quality assurance programme is established and implemented for the safe operation of the installation. The establishment and implementation of this programme may be delegated to other organisations or specialists, but responsibility for the overall effectiveness of the programme remains with the licensee.

The organisation in charge of assessing the efficiency of the quality assurance programme and of verifying that activities are carried out in compliance with the established requirements should have the authority, freedom and independence, within the overall organisation of the licensee, required to identify quality-related problems and verify the effectiveness of the solutions adopted.

In addition to the independent assessment, the licensees are introducing self-assessment activities in order to improve the efficiency of the programmes.

All safety-related activities performed by and for the Spanish nuclear facilities are required to fulfil the quality assurance programme applicable to them. As a result, not only the activities performed at the nuclear facilities themselves, during the different phases of siting, design, construction, start-up, operation and dismantling and decommissioning are included, but also those performed by external organisations, such as the engineering, manufacturing and inspection of structures, systems or components destined for such facilities. This also includes the transport of radioactive substances, which must be carried out in accordance with the quality assurance programmes of the companies involved.

23.2. System for the inspection and assessment of quality assurance programmes

In accordance with point 19.3 of this report (Nuclear and radioactive facility inspection and assessment system), and in order to check for correct compliance with the conditions and requirements of the authorisations and assess the way in which the latter are operating, the assessments and inspections of the different quality assurance programmes are performed as follows:

1. Assessments

   A check is made to ensure that the quality assurance manuals develop the recommended nuclear standards, that the persons responsible for quality assurance have sufficient authority and freedom to identify conditions adverse to quality, recommend or facilitate solutions and verify their implementation, and that mechanisms are established for such persons to have access to a level of management guaranteeing the authority, freedom and independence required for the performance of their functions. Likewise, the specific quality plans applicable to the design and manufacturing of new and spent fuel transport and storage casks are assessed.

2. Inspections

   Every two years a revision is performed on the quality assurance programmes for the El Cabril low and intermediate level radioactive waste centralised disposal facility and the dismantling activities carried out at the Vandellós I NPP.

Additionally, inspections are habitually carried out with respect to the quality assurance programmes of other installations and activities, such as: dismantling of the Elefante plant for the treatment of natural uranium concentrates, dismantling of the CIEMAT facilities, radioactive material transport companies and the design or manufacturing of irradiated fuel casks.

23.3 Assessment of compliance

From what has been said in the previous sections it may be deduced that Spain possesses a suitable regulatory framework and that adequate quality assurance programmes are applied in relation to the management of spent fuel and radioactive waste.

Article 24
Operational radiation protection

Article 24. Operational Radiation Protection

1. *Each Contracting Party shall take the appropriate steps to ensure that during the operating lifetime of a spent fuel or radioactive waste management facility:*
   - *i) the radiation exposure of the workers and the public caused by the facility shall be kept as low as reasonably achievable, economic and social factors being taken into account;*
   - *ii) no individual shall be exposed, in normal situations, to radiation doses which exceed national prescriptions for dose limitation which have due regard to internationally endorsed standards on radiation protection; and*
   - *iii) measures are taken to prevent unplanned and uncontrolled releases of radioactive materials into the environment.*
2. *Each Contracting Party shall take appropriate steps to ensure that discharges shall be limited:*
   - *i) to keep exposure to radiation as low as reasonably achievable, economic and social factors being taken into account; and*
   - *ii) so that no individual shall be exposed, in normal situations, to radiation doses which exceed national prescriptions for dose limitation which have due regard to internationally endorsed standards on radiation protection.*
3. *Each Contracting Party shall take appropriate steps to ensure that during the operating lifetime of a regulated nuclear facility, in the event that an unplanned or uncontrolled release of radioactive materials into the environment occurs, appropriate corrective measures are implemented to control the release and mitigate its effects.*

The Regulation on Protection against Ionising Radiations (Span. *Reglamento de Protección Sanitaria contra Radiaciones Ionizantes*, RPSRI) currently in force was published in July 2001 and constitutes the transposition to the Spanish regulations of EU Directive 96/29 EURATOM as regards the protection of the workers and the members of the public against the risks deriving from ionising radiations.

Consequently, these standards are applicable to facilities at which spent fuel or radioactive waste are stored.

The Regulation establishes justification, optimisation and limitation as the basic principles of protection, and goes on to set out the general standards and requirements applicable to the different groups and situations.

In Spain spent fuel is stored temporarily at the nuclear power plants, as a result of which the protection requirements are encompassed in the general requirements applicable to such facilities. Low and intermediate level radioactive waste is disposed of at ENRESA's El Cabril facility in Sierra Albarrana (Córdoba).

Described below are the measures implemented in Spain to protect the workers and the members of the public during the operating lifetime of spent fuel and radioactive waste installations.

24.1. Protection of the workers

24.1.1. Measures adopted to ensure that exposure to radiations is maintained at the lowest level reasonably achievable

The concept of optimisation of protection, commonly known as the ALARA criterion, was first introduced by the International Commission on Radiological Protection (ICRP) in its publication number 26, and subsequently maintained and reinforced in publication 60.

The ALARA criterion is included in the aforementioned regulation; thus article 4 establishes that Individual doses, the number of persons exposed and the probability of occurrence of potential exposures shall be kept at the lowest values reasonably possible, taking into account economic and social factors.

The methods used to analyse and achieve an optimum level for protection range from common sense to the most complex cost/benefit and multiple attribute analysis techniques. The process of optimisation is related essentially to the radiation source and should first be applied during the design phase. It is in this phase that reducing dose through quantitative analysis is most efficient. During the operating phase, on the other hand, informal analyses based on experience, good practice and engineering judgement prevail.

As regards compliance with the regulatory requirement that the doses received by professionally exposed workers be kept as low as reasonably possible, the following may be underlined:

- ✓ The rational application of this principle at the facilities translates into achieving a level of exposure to radiations that is sufficiently low to ensure adequate protection of the workers (within a dose range far below the established limits), but without challenging the economic feasibility of the facilities.
- ✓ One of the indices most widely used internationally to assess the degree of application of the ALARA criterion is the value of annual collective dose.
- ✓ The CSN regularly performs a comparative analysis of the values obtained for this index at the Spanish plants and at those in the USA and the OECD member countries.

The results obtained for this index point to the fact that in overall terms the situation at the Spanish facilities as regards application of the ALARA criterion is in keeping with that exis-

ting in other countries. With a view to ensuring that this situation is maintained, the CSN is currently promoting a higher degree of development in implementation of the ALARA principle. In this respect two courses of action are being applied:

✓ The use of more complete and adequate indices for effective assessment of the degree of implementation of the ALARA principle.

In this area the CSN has published its Safety Guide GSG-01.05 Documentation on refuelling activities at light water reactor nuclear power plants, which since 1991 has made it possible to acquire complete information on the collective dose associated with each of the tasks performed during refuelling outages, using for such tasks a coding system compatible with that applied in the EU.

Similarly, the CSN participates actively in the Information System on Occupational Exposure (ISOE), promoted by the NEA-OECD. This participation allows the CSN to have access to international information and data on collective dose by tasks and on the dose reduction techniques applied the different countries.

✓ In-depth review of the content, structure and scope of the dose reduction programmes implemented at the Spanish plants, based on three lines of action:

➪ Extend responsibility for application of the ALARA principle (currently delegated to the Radiation Protection Services) to other organisational units, in particular to higher levels of management.

➪ Reinforce the efficiency of application of the ALARA criterion through a structure set up specifically and permanently for its management.

➪ Homogenise dose reduction programmes.

In 1999 the CSN published its Safety Guide 1.12 "Practical application of radiation protection optimisation in the operation of nuclear power plants", which contains the general criteria to be considered by the organisation of companies participating in activities relating to nuclear power plant operation for management of the optimisation of exposures to ionising radiations.

24.1.2. Measures adopted to ensure that no worker is exposed in normal situations to radiation doses exceeding the national prescriptions on dose limitation, taking into due account the internationally approved radiation protection standards

The dose limits for professionally exposed workers established in the new RPSRI are based on the recommendations of ICRP- 60 and are as follows:

1. Effective dose limit (5 official consecutive years): 100 mSv, subject to a maximum effective dose of 50 mSv in any official year.
2. Annual equivalent dose limits (official year)

Skin (averaged over 1 cm^2)	Lens	Hands, forearms, feet and ankles
500 mSv	150 mSv	500 mSv

In order to prevent the workers from being exposed, they are classified depending on their working conditions; places of work are also classified in different zones depending on the annual doses that it is possible to receive in them, and the standards and measures for control to be applied in the different zones and to the different categories of workers are established. Likewise, requirements are established for the determination and registering of doses and for the medical surveillance of the workers.

As regards compliance with the dose limits established for professionally exposed workers, the standards in force in Spain in relation to radiation protection include the following requirements relating to the dosimetry of those people that, as a result of their professional activity, are exposed to the action of ionising radiations:

- ✓ Adequate surveillance systems should be available to determine the doses received by exposed workers.
- ✓ Individual dosimetry should be undertaken by entities expressly authorised by the CSN.
- ✓ Work performed in the presence of ionising radiations should be carried out in such a way as to ensure that the doses received by the exposed workers are lower than the established dose limits.

The situation of the dosimetry of professionally exposed workers at the Spanish nuclear facilities may be analysed on the basis of assessment of the degree to which these regulatory requirements are satisfied in practice.

The practice adhered to by the Spanish facilities as regards the radiological surveillance systems used to determine the doses received by their personnel is in keeping with the directives emanating in this respect from the International Commission on Radiological Protection (ICRP); indeed:

- ✓ Professionally exposed workers classified as belonging to Category A are provided with individual physical dosimeters (official dosimetry), the monthly processing of which allows insight to be gained into the doses received by them during the performance of the activities carried out during this time.
- ✓ In addition, for the performance of tasks inside the controlled zone, individual direct reading dosimeters are used (operational dosimetry), allowing immediate insight to be gained into the doses received in performing such tasks. This allows for adequate planning of the tasks from the radiological point of view.
- ✓ Apart from these individual radiological surveillance systems, there are fixed and portable systems for the surveillance of zones, distributed throughout previously selected areas and allowing the doses received by the workers in these areas to be assessed.
- ✓ The individual doses received by professionally exposed workers belonging to Category B may be assessed from the results of the surveillance performed in the working environment, as long as it is possible to demonstrate that the workers in question are correctly classified in this category.
- ✓ The control of the internal dosimetry of workers running the risk of incorporating radioactive material is carried out at least annually in the case of workers belonging to the facility's workforce. In the case of contractor workers, the controls are applied prior to and following the operations to be performed.

The suitability of the surveillance systems used is assessed by the CSN during the design phase of the facilities. Also subject to assessment are aspects relating to the maintenance and operation of such systems, these being additionally verified during the periodic inspections carried out by the CSN.

The situation of the Spanish nuclear facilities as regards compliance with the regulatory dose limits may be considered satisfactory, since:

- ✓ As regards external dosimetry, there has not been any case of the regulatory dose limits having been exceeded. Furthermore, the results obtained systematically show that a high percentage (more than 90%) of the workers exposed present doses lower than one tenth of the said limits.
- ✓ As regards internal dosimetry, the experience acquired to date is satisfactory, since cases of internal contamination occur only very sporadically. Indeed, despite the fact that the recording level established by the CSN (1% of the regulatory Annual Incorporation Limit), which was in force until the end of 2000, is far lower than the value recommended in this respect by the International Commission on Radiological Protection (10% of the Annual Incorporation Limit), only in very few cases has this recording level been exceeded. As from January 2001 the value of 1 mSv was established as the annual recording level.

The dose values obtained using the official dosimetry systems are submitted periodically to the CSN, which is in charge of managing and maintaining a national dosimetry bank. Such submittals allow the CSN to assess the dosimetry data and implement the appropriate corrective actions in the event of any anomaly being detected. The licensees of the facilities are also obliged to notify the CSN of any incident involving a potential over-exposure to radiations, assessing the suitability of the actions performed by the radiological protection services and requiring, where necessary, the adoption of additional measures and the actions required to prevent analogous incidents from being repeated.

Presented below are specific data on the dosimetry of professionally exposed workers, shown as they were included in the CSN report to the lower house of the Spanish Parliament for 2004.

a) El Cabril radioactive waste disposal facility

   The professionally exposed workers carrying out activities at the El Cabril radioactive waste disposal facility in 2004 numbered 231. The dosimeter readings gave a collective dose of 25 mSv/person. If only those workers who received significant doses are considered, the individual average dose for this group amounted to 0.72 mSv/year, this implying a percentage of 1.44% with respect to the annual limit.

b) Nuclear Power Plants

   As regards the dosimetry results for 2004 for the nuclear power plants overall, 6,077 professionally exposed workers carried out their activities in this area and were dosimetrically controlled. These dosimetry readings gave a collective dose of 3,068 mSv/person, the individual average mean dose for this group amounting to 1.31 mSv/year, with consideration given in calculating this parameter only to workers receiving significant doses. This individual average dose amounted to 2.61% of the annual dose limit (50 mSv/year).

The main contribution to the collective dose in this sector (2,610 mSv. person) corresponded to the contracted personnel, with a total 4,131 workers and an individual average dose of 1.43mSv/year. In the case of the site personnel, the collective dose was 458 mSv/person, with a total 1,971 workers and an individual average dose of 0.88 mSv/year.

As regards internal dosimetry, controls were performed through the direct measurement of body radioactivity in all workers running a significant risk of incorporating radionuclides, and in no case were values in excess of the recording level established (1% of the annual incorporation limit) detected.

24.2. Protection of the public

Within the Spanish legislative framework, the Regulation on the Protection of Health against Ionising Radiations (RPSRI) expressly requires that the exposure resulting for the members of the public from a justified practice be kept as low as is reasonably possible, taking into account economic and social factors (ALARA). This philosophy is in general applicable during the licensing phase as well as during the operation, dismantling and decommissioning of Spanish nuclear facilities, and in particular of those used for the storage of spent fuel and the management of radioactive waste; and so it is reflected in the official operating documentation of each such facility.

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

- ✓ An effective dose limit of 1 mSv per official year. Notwithstanding the above, higher effective doses may be authorised in a single official year, as long as the average over five consecutive official years does not exceed the aforementioned value.
- ✓ Notwithstanding the above, an equivalent dose limit per official year of 15 mSv for the lens and 50 mSv for the skin is established.

Likewise, in order to guarantee compliance with these limits and ensure that the exposure of the population is kept as low as reasonably possible, the following is required:

- ✓ Practices are appropriately designed such that the environmental releases of radioactive effluents are avoided or reasonably minimised.
- ✓ The levels of activity for the emission to the environment of radioactive effluents shall be such that both the concentrations of activity of the radionuclides present therein and the doses that might be received by the population are as low as reasonably possible, taking into account economic and social factors, and in all cases lower than the limits specified for the members of the public.
- ✓ Facilities at which effluents and solid wastes implying a significant radiological risk may be generated shall be provided with independent and specific systems for their storage, treatment and, where appropriate, disposal, the operation of which shall be subject to adequate revisions to prevent uncontrolled releases.

24.2.1. Limitation of releases at nuclear facilities

Releases of radioactive effluents require express authorisation from the MITYC, following a report by the Nuclear Safety Council (CSN). The operating permits of all the Spanish nuclear facilities establish the system for the limitation, surveillance and control of radioactive effluents, as part of the Operating Technical Specifications (OTS's), this including the following:

- ✓ release limits,
- ✓ the sampling and analysis programme required to verify compliance with the limits,
- ✓ the obligation to perform monthly dose calculations and estimate the dose over the last twelve consecutive months,
- ✓ the minimum instrumentation required for the surveillance and control of effluents, as well as the operability requirements, surveillance tests and determination of monitor setpoints, and
- ✓ the operability requirements of the effluent treatment systems, establishing the obligation to perform a dose forecast with a view to planning treatment of the effluents prior to their off-site release.

At the nuclear power plants, the detailed development of these Technical Specifications is included in the Dose Calculation Manual (EDCM), this not being the case at the El Cabril waste disposal facility, where they are developed in the Specifications document itself. The EDCM is an official operating document of the nuclear facilities and includes the methodology and parameters used to estimate the dose to the critical individual and in calculating the setpoints of effluent monitors.

An effective dose limit of 0.1 mSv/year is currently applied to the nuclear power plants, both during operation and dismantling, considered for periods of twelve consecutive months. This value, which corresponds to the overall effluents emitted by each of the groups at a site, is distributed between liquids and gases depending on the specific characteristics of the site, although it is normally 0.08 mSv/year for gaseous effluents and 0.02 mSv/year for liquid effluents.

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

At the El Cabril Disposal Facility the criterion of zero releases is applied to liquid radioactive effluents; the potentially contaminated waters generated are incorporated in the mortar used to backfill the containers. Consequently, only gaseous radioactive effluents are emitted at this facility, for which the discharge limit is an effective dose of 0.01 mSv over twelve consecutive months.

24.2.2. Verification of compliance with release limits

Given that the release limits are established in terms of dose, the licensees of the Spanish nuclear facilities have to estimate monthly the doses accumulated over twelve consecutive months. These calculations are performed considering as the source term the

results obtained from the sampling and analysis programmes, applying the procedures specified in the EDCM.

The objective of the estimate of doses due to radioactive effluents is to verify compliance with the release limits even under the most unfavourable conditions, as a result of which they are highly conservative. A critical group is defined for each facility, as described in ICRP-60. The critical groups are assumed to be located in the area in which the concentration in the air and the deposition of aerosols are estimated to be maximum. As regards the parameters involved in the calculations, for local characteristics, the habits of the population and the use made of the land and water are considered to be values specific to each site. However, certain generic values are also used, such as the time during which animals graze and the time elapsing between foodstuff production and its consumption, etc. The methodology used, which is described in the EDCM, is the same for all the Spanish nuclear facilities and considers the following assumptions:

- ✓ the calculations are performed for the maximum individuals, understood as being those whose habits represent a reasonable deviation from the mean of the population,
- ✓ all the foodstuffs consumed are produced in the area housing the critical group, and
- ✓ the critical group for gaseous effluents also consumes water, crops irrigated with and animal products contaminated by the water affected by the liquid effluents released.

The values obtained from these calculations, along with other relevant data on the effluents, are submitted monthly to the CSN, which verifies compliance with the authorised limits and performs an analysis and assessment of release trends.

The OTS's also establish that the licensees are required to undertake environmental radiological surveillance programmes (ERSP's) in the areas of influence of nuclear facilities. These programmes, which are previously evaluated and approved by the CSN, imply the collection and analysis of a large number of samples of air, water, soils and sediments, indicator organisms and foodstuffs. From the results of the ERSP's, which are submitted annually to the CSN, insight may be gained into the real impact of releases on the environment.

Additionally, the CSN performs periodic dose estimates based on actual release data and environmental measurements.

24.2.3. Control of releases

In keeping with the regulatory requirements, the Spanish nuclear facilities are equipped with liquid and gaseous effluent treatment systems, the design of which takes into account the principle of optimisation, which incorporate the instrumentation required for adequate surveillance and control of the effluents prior to their discharge off site. These systems allow the different types of liquid and gaseous radioactive wastes generated both during the normal operation of the facilities and during the foreseen operational incidents to be collected, stored and processed.

The operating permits of nuclear facilities require the licensee to perform a detailed study of releases and a radiological assessment of their consequences and to describe the compliance with the national and international requirements by the measures adopted for their treatment and control.

During operation, the licensees have to demonstrate that all reasonable efforts are made to reduce releases and to keep their radiological impact as low as is technically and economically possible, from waste generation up to the operating procedures of the treatment systems. They are required to implement an on-going improvement programme in keeping with the evolution of the applicable standards, technological progress and operating experience. Likewise, they are required to consider the applicability of the new standards emerging in the countries of origin of their designs.

For some years now the NPP licensees have also been required to carry out periodic safety reviews ensuring the following on the basis of ten-year periods:

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

Furthermore, the CSN carries out systematic analyses of the trends observed in the release of effluents from all the nuclear facilities, requiring the licensees to justify any increasing trend and return to the original values if feasible, even when the values are far below the release limits established. In this respect, "Reference levels" are used for the liquid and gaseous effluents of the Spanish nuclear power plants, 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 the adequate framework for the efficient application of a clearly established policy that requires the implementation of the applicable technological advances, meets the requirements and recommendations of the competent international organisations and incorporates the measures necessary to ensure that releases are limited and that the impact on the public and the environment is minimised.

The releases in 2003 and 2004 from the Spanish nuclear power plants and from the El Cabril disposal facility are summarised in Tables 10 and 11, respectively.

These releases represent a minimal risk for the members of the public and for the population overall, as may be appreciated from the doses due to the releases of both years. Despite the very conservative approaches used for their estimation, the values obtained for the effluents (liquid and gaseous) of the Spanish nuclear power plants have in no case exceeded 3.5 % of the release limit, or 0.1% in the case of the effluents (gaseous) of the El Cabril facility.

24.2.4. Non-scheduled or uncontrolled releases

In order to prevent the non-scheduled and uncontrolled release of radioactive materials to the environment, the Spanish nuclear facilities are equipped with the following:

- ✓ Surveillance instrumentation allowing such releases to be detected

Table 10
Activity of radioactive effluents from the Spanish NPP's (Bq).

	PWR Plants						BWR Plants	
	José Cabrera	Almaraz I y II	Ascó I	Ascó II	Vandellós II	Trillo	Sta Mª Garoña	Cofrentes
Liquid efluents								
2003								
Total exc. Tritium & Gases	4,72 x10^{7}	4,17 x 10^{9}	5,78 x 10^{9}	2,43 x 10^{9}	2,55 x 10^{10}	7,67 x 10^{8}	8,36 x 10^{8}	1,80 x 10^{8}
Tritium	9,53 x 10^{12}	4,51 x 10^{13}	9,38 x 10^{12}	3,72 x 10^{13}	3,23 x 10^{13}	1,76 x 10^{13}	3,81 x 10^{11}	1,02 x 10^{12}
Disolved gases	LID	LID	1,08 x 10^{9}	2,13 x 10^{8}	5,31 x 10^{8}	(*)	LID	4,90 x 10^{8}
2004								
Total exc. Tritium & Gases	3,61 x 10^{7}	2,17 x 10^{9}	6,38 x 10^{9}	7,37 x 10^{9}	6,30 x 10^{9}	3,56 x 10^{8}	3,41 x 10^{8}	1,82 x 10^{7}
Tritium	2,96 x 10^{12}	4,42 x 10^{13}	3,91 x 10^{13}	1,65 x 10^{13}	2,86 x 10^{13}	2,85 x 10^{13}	2,54 x 10^{11}	7,09 x 10^{10}
Disolved gases	LID	LID	4,28 x 10^{9}	1,35 x 10^{8}	7,79 x 10^{8}	(*)	LID	LID
Gaseous efluents								
2003								
Noble Gases	9,35 x 10^{12}	3,04 x 10^{11}	8,21 x 10^{12}	2,91 x 10^{11}	1,78 x 10^{12}	3,45 x 10^{11}	LID	1,41 x 10^{13}
Halogens	1,55 x 10^{5}	2,31 x 10^{4}	2,73 x 10^{6}	LID	4,81 x 10^{8}	1,63 x 10^{6}	6,26 x 10^{7}	6,72 x 10^{9}
Particles	2,15 x 10^{4}	3,40 x 10^{6}	5,15 x 10^{6}	1,94 x 10^{6}	6,85 x 10^{7}	1,82 x 10^{5}	1,55 x 10^{7}	5,09 x 10^{7}
Tritium	4,25 x 10^{10}	3,32 x 10^{12}	6,16 x 10^{11}	1,40 x 10^{12}	1,98 x 10^{11}	6,75 x 10^{11}	4,00 x 10^{11}	2,00 x 10^{12}
2004								
Noble Gases	8,17 x 10^{12}	3,28 x 10^{11}	1,26 x 10^{13}	1,27 x 10^{10}	1,71 x 10^{11}	1,20 x 10^{11}	LID	4,93 x 10^{13}
Halogens	LID	LID	3,65 x 10^{8}	8,29 x 10^{4}	4, 12 x 10^{6}	LID	1,41 x 10^{8}	2,16 x 10^{10}
Particles	3,04 x 10^{5}	2,27 x 10^{5}	2,38 x 10^{6}	3,48 x 10^{6}	7,39 x 10^{4}	1,02 x 10^{5}	7,04 x 10^{8}	2,22 x 10^{8}
Tritium	7,56 x 10^{10}	4,43 x 10^{12}	5,73 x 10^{11}	1,11 x 10^{12}	1,46 x 10^{11}	1,18 x 10^{12}	4,52 x 10^{11}	2,89 x 10^{12}

(*) The liquid releases do not entrain dissolved gases since they are eliminated during the treatment process.

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

Gaseous efluents	Total Alpha activity (Bq)	Total Beta activity (Bq)	Gamma activity (Bq)	Tritium activity (Bq)
2003	5,24 x 10^{3}	9,79 x 10^{4}	1,35 x 10^{3}	6,38 x 10^{8}
2004	6,41 x 10^{3}	1,01 x 10^{5}	LID	1,69 x 10^{9}

- ✓ Devices isolating the releases in the event of previously established values being exceeded
- ✓ Activation of alarms in the event of abnormal conditions being detected
- ✓ Administrative controls.

However, if despite these measures an uncontrolled or non-scheduled release occurs, the NPP licensees are required to adopt the measures necessary to detain or control such releases – if possible – and minimise their impact off site. Likewise, they must identify the underlying cause or causes and define the actions to be adopted to prevent recurrence. All these aspects must be reported to the CSN for analysis and approval. If considered necessary, the measures adopted are incorporated at the other facilities of the same type.

The ERSP's carried out by the licensees of the nuclear facilities allow for the identification of increases in activity in the environment as a result of such releases and for verification of the efficiency of the measures adopted to mitigate their effects.

During the period of time covered by this report there has been no non-scheduled release from any of the Spanish nuclear facilities.

24.3. Assessment of compliance

The responsibility assigned by the Spanish standards to the licensees of nuclear facilities includes aspects relating to the control of liquid and gaseous radioactive releases. The Spanish facilities are considered to correctly fulfil the requirements of art. 24 of the Convention, due both to their applying the ALARA criterion and to their implementing workers protection measures, surveillance programmes, the limitation and control of effluents and environmental surveillance programmes.

Article 25
Emergency preparedness

Art. 25. Emergency preparedness.

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

25.1. Assignment of responsibilities in emergency situations

The Basic Nuclear Emergency Plan (PLABEN) deals with planning and preparedness for emergency situations and establishes the different competent authorities and public bodies of the State, Autonomous Community and Local Administrations that intervene in the event of an emergency and in relation to radioactive waste management.

The main competent authorities and public bodies intervening in such cases are as follows:

1. The Ministry of the Interior is assigned the responsibilities corresponding to the State in all issues relating to civil defence.
2. The CSN is assigned the responsibilities corresponding to it as the body solely responsible for nuclear safety and radiation protection.
3. The regional and local administrations (Autonomous Communities, Town Councils and County Councils affected 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, supplies and shelter and others.
4. ENRESA is responsible for acting in support of the civil defence services, in the manner and under the circumstances required of it in each case.

The international organisations with which contacts are maintained in the event of an emergency are identified below, in sub-section 25.5 of the present report.

25.2. Legislative and regulatory framework for emergency situations

The planning and preparedness for emergency situations are governed in Spain by the Basic Nuclear Emergency Plan (PLABEN) and by the RINR. General provisions on the emergencies that might occur at nuclear or radioactive facilities or in the transport of radioactive materials are also included in the following:

✓ The Civil Defence Standard

This standard, approved by Royal Decree on April 24th 1992, determines the way in which responsibilities for the planning and preparedness for emergencies of different types are distributed among the entities that make up the Spanish State: the Government of the Nation (competence of the central State), the Autonomous Communities and the local bodies.

✓ 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. The Plan was published by way of a Royal Decree emanating from the Ministry of the Interior on July 14th 2004.

The PLABEN serves as a guideline containing the standards and criteria essential for the preparation, effective implementation and continued efficiency of the civil defence plans for nuclear emergencies, responsibility for which is to the central State Administration with participation by the other regional Administrations. Its objectives are to reduce the risk of accidents or mitigate their consequences at the point of origin, preventing, or at least reducing to the extent possible, the adverse effects of ionising radiations on the population and on property, in which respect it defines the actions foreseen by the Public Authorities for their appropriate and adequate protection. The PLABEN contains

fundamentally the radiological criteria defined by the CSN for planning of the response to emergencies at nuclear facilities.

For the practical purposes of application the PLABEN is developed in the following:

- The Nuclear Facilities' Site Emergency Plans (PEI)
- Off-site Nuclear Emergency Plans (PEN)
- Municipal Action Plans for Nuclear Emergencies (PAMEN),
- And the Nuclear Emergency Plan at the Central Level of Response and Support (PENCRA), which defines the organisation, structure and functions at National level in response to emergencies.

✓ Law creating the CSN

Law 15/1980, of April 22nd, by which the CSN was created, remains in force and is complemented by Law 14/1999, of May 4th, on Public Prices and Tariffs for services rendered by the Nuclear Safety Council, which modifies the articles of the aforementioned CSN creation Law, extending the coverage of the functions performed by the Council and more specifically those relating to the its functions and realms of competence in emergency situations.

✓ Regulation on Nuclear and Radioactive Facilities (RNRF)

The RINR in force, which was published by way of Royal Decree 1836/1999 emanating from the Ministry of Industry and Energy, requires that in order to obtain the obligatory authorisations for the exploitation or operation of a nuclear facility the applicants draw up and submit an Emergency Plan, which will be approved on the awarding of such authorisations.

No facility exists in Spain having the management of spent fuel as its main purpose; there is, however, a facility whose main purpose is the management of radioactive waste and which, according to the Spanish regulations is classified as a nuclear facility. Like the nuclear power plants, this facility is required to have a Site Emergency Plan, which is currently approved by the MITYC following the necessary report by the CSN, which evaluates the Plan against specific national and international standards.

✓ Royal Decree creating ENRESA

Royal Decree 1522/84, of July 4th 1984[24] authorised the constitution of the ENRESA and assigns to it the function of supporting the civil defence services in the event of nuclear or radiological emergencies, in the manner and under the circumstances required of it.

✓ Basic Guidelines on Civil Defence Planning to cover the Risk of Accidents in the Road and Rail Transport of Hazardous Goods.

These Guidelines, which were approved by Royal Decree 387/1996, of July 1st 1996, establish the basic elements of emergency planning at State Adminis-

[24]As has been pointed out repeatedly throughout this report, RD 1522/84 was superseded by RD 1349/2003, of October 31st, on the Ordering of ENRESA's activities, this latter consisting basically of the rewording in a single text of the various standards that had previously made up the legal regulations applicable to ENRESA. Nevertheless, references to the 1984 RD are maintained since it was originally the standard attributing functions to ENRESA.

tration and Autonomous Community level, the situations for emergency management and the coordinating bodies applicable in the case of accidents during the road and rail transport of hazardous good, among which are included radioactive materials (Class VII hazardous materials).

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

✓ Site Response Level

The actions for preparedness and response to emergency situations at this level are contained in the nuclear facility Site Emergency Plans.

The objective of these Plans is to cover the actions foreseen by the licensee of the nuclear facility to reduce the risk of a radiological emergency and, were one to occur, to reduce the release of radioactive material to the environment.

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

In the NPP Site Emergency Plans the possible accidents that might occur during the operation of these facilities are classified in 4 emergency categories that are established depending on the plant conditions, taking into account the maximum amount of radioactive material that might be released off site in the event of a pessimistic evolution of the emergency initiating event.

Analogously, at the radioactive waste management facility existing in Spain emergency situations are classified in three categories, in order of increasing seriousness and decreasing probability: Category I (Emergency Pre-Alert), Category II (Emergency Alert) and Category III (Site Emergency). This classification is based on the accident and risk assessments carried out with respect to the facility, from which it has been deduced that there would be no off-site release of radioactive materials in a quantity such that an emergency plan would need to be adopted outside the installation.

The Site Emergency Plans are obligatory documents for the request and awarding of an operating permit for any nuclear facility. The process via which they are approved has been described in the previous section dealing with the RINR in force.

✓ Off-site Response Level

The actions for preparedness and response to emergency situations at this level are established in the following:

- The NPP off-site Nuclear Emergency Plans, which in turn include the plans for actions at municipal level in the event of a nuclear emergency (PAMEN).
- The Central Level of Response and Support. This constitutes a response mode at a national level that foresees the mobilization of all necessary resources and capacities of the Spanish State.

The management of national resources to support the off-site Nuclear Emergency Plans is carried out via the Directorate General for Civil Defence and Emergencies (DGCD&E), part of the structure of the Ministry of the Interior, which is the body coordinating all the necessary support provided by the different Organisations of the Central and other Administrations and the CSN in all areas relating to nuclear safety and radiological protection, coordinating also the various public or private companies and organisations whose participation is required to cover the specific functions attributed to it.

✓ CSN Preparedness and Response to emergency situations

The actions of the CSN during a real emergency situation, implemented through its Emergency Response Organisation (ERO) take priority over all other CSN activities. Consequently, whenever considered necessary by the Emergency Division, all of the CSN resources will be made available to the ERO and whatever other activities might be on-going will be immediately suspended.

The ERO acts independently of the regulatory and control function assigned to the CSN and has the following exclusive functions:

- Collaborating in taking the emergency situation to safe conditions.
- Contributing to the mitigation of the radiological consequences for people, property and the environment of the accident giving rise to 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.
- Complying with international commitments regarding prompt notification and mutual assistance insofar as the CSN is affected thereby.

With a view to fulfilling all these functions, the CSN has developed an Emergency Action Plan, the 4th revision of which has recently been approved (April 27th 2005). This includes a special Organisation of the CSN's human resources and the availability of specific resources and tools supporting the processes to be performed by this organisation. The Emergency Room (SALEM) is the place at which the CSN Emergency Response Organisation performs its functions and where the tools required for this are located. In addition, the CSN

Emergency Response Organisation has stand-by personnel assigned, working weekly shifts, who are required to be available permanently to move to both the SALEM and the locations affected by an emergency situation.

Annex E of this report includes a summary description of the Action Plan of the CSN and of its ERO to respond to emergencies.

25.4. Preparation and training: Drills and exercises

The general aspects of the preparation and training of those people that might intervene in an emergency are included in the PLABEN, which establishes the requirement for development of the Guidelines on previous Information for the public, Preparation and Training, Exercises and Drills, in the Off-site Nuclear Emergency Plans and in the Cabinet Agreement of 1999 that transposes the Directive of the Council of the European Union 89/618/EURATOM on information for the population.

The activities of preparing and training emergency response personnel are subject to a planning that materialises specifically in annual programmes for both the personnel of the nuclear facilities and for those people from the public administrations who are required to intervene in addressing radiological emergencies. These programmes include theoretical and practical courses, training exercises and partial and general drills designed to verify the degree of preparedness of the personnel and the support systems and equipment.

An annual site emergency drill is performed at the radioactive waste management facility. The objective of this emergency drill is to verify the suitability of the facility's Site Emergency Plan through the performance of a set of activities that include most of the radiological emergency response actions established in the said Plan.

The CSN monitors the development of the annual emergency drills at the aforementioned facility and at the rest of the nuclear facilities through the activation and intervention of its emergency response organisation in the SALEM. The participation of the CSN emergency response organisation in these drills takes place under conditions of maximum realism, applying the procedures in place for the activation and intervention of its different operating groups. Furthermore, the drills include coordination between the CSN and the corresponding Provincial and National Authorities, the aim being to verify the general efficiency of the procedures in place for coordination with the entities involved.

Additionally, the CSN sends inspectors to the facilities to perform checks on the implementation of the Site Emergency Plan and in-situ tracking of the development of the drills, the objective being to control their performance and require that the facility implement whatever corrective actions might be determined from the observations made.

25.5. Arrangements at international level, including with neighbouring countries, as required

Spain has subscribed the Convention on Early Notification of a Nuclear Accident and the Convention on Assistance in the case of a Nuclear Accident or Radiological Emergency. To these effects, the contacts established are the CSN, with the SALEM as its operating centre, and the DGCD&E and its Operations Coordination Room (SACOP).

Furthermore, as a member of the European Union, the Spanish State must establish within its territory and with respect to other States and the Commission what is provided for in the Decision of the Council 87/600/EURATOM regarding Community arrangements for the rapid exchange of information in the event of a nuclear accident or radiological emergency, known as the ECURIE agreements or arrangements. The CSN is the Competent National Authority for ECURIE and the SALEM is its National Point of Contact.

In addition, the Spanish and Portuguese States have subscribed and maintain a Bilateral Agreement on the Nuclear Safety of Frontier Nuclear Facilities, which covers specific actions for notification and the exchange of information in the event of a nuclear accident or radiological emergency occurring in, 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 this Bilateral Agreement and the SALEM is its National Point of Contact.

Spain participates actively in the programmes of exercises and drills established at international level: the exercises of the European Union's ECURIE system, the OECD's INEX.2 and CONVEX exercises programme and bilateral exercises with Portugal. The CSN participates in these activities, its emergency response organisation being activated in certain cases in coordination with the emergency resources of Civil Defence and the central Government. In addition to verifying the international procedures for the notification of nuclear emergencies and the exchange of information, these exercises also put into practice the national procedures for coordination between the different institutions involved, especially those relating to tracking of the situation, decision-making and information for the media and for the population overall.

25.6. Assessment of compliance

From what has been said above, it may be deduced that in Spain the planning for and response to situations of radiological emergency meet the requirements of Articles 25.1 and 25.2 of the Convention.

The Spanish Integrated Emergency Plan, made up of the Site Emergency Plans of the nuclear facilities, the Off-site Response Level Plans, the CSN Emergency Action Plan and the instruments adequate for coordination and interfacing between them, implies compliance with the provisions of article 25.1 of the Convention, since, as has been pointed out above, these are regularly tested through the periodic performance of partial and integrated exercises and drills.

Along with the International and Bilateral Agreements subscribed by Spain in relation to emergencies, these instruments for planning and response guarantee compliance with Article 25.2 of the Convention.

In Spain there are currently certain on-going and scheduled actions aimed at improving the general capacity of the State to respond to nuclear emergencies. Certain of these have recently been specified and refer to the following:

- ✓ The Basic Nuclear Emergency Plan has been revised in order to incorporate, among other aspects, the new radiological criteria defined at international level, one of which is the philosophy of levels of intervention based on avoided doses. Furthermore, the new structuring of the national Administration has

been incorporated, as defined in Law 6/1997 on the Organisation and Functioning of the General State Administration.

- ✓ The CSN has developed a computer application, known as GEMINIS, for the operational and maintenance management of the equipment required to detect and measure radiations in emergency situations, included in the Level of Off-site Response.

- ✓ The CSN has approved its new Emergency Action Plan, which is currently in the process of implementation. This restructures the emergency response organisation, increasing its operability in emergency situations.

Likewise, the Off-site Nuclear Emergency Plans are currently undergoing a process of revision for adaptation to the requirements of the PLABEN, the CSN's SALEM is being architecturally remodelled and a new Communications Network is being implemented between the SALEM and the key facilities, institutions and organisations that would be involved in an emergency situation, in order to increase the quality and reliability of such communications.

Article 26
Decommissioning

Art. 26. Decommissioning

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

i) Qualified staff and adequate financial resources are available;

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

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

iv) records of information important to decommissioning are kept.

According to the RINR, dismantling is the process by which the licensee of a facility, having obtained the corresponding authorisation, carries out the activities of decontamination, the disassembly of equipment, the demolition of structures and the removal of materials with the ultimate aim of allowing for the complete or restricted release of the site. The process of dismantling concludes with a declaration of decommissioning that frees the licensee of the facility from his responsibility as its operator and that, in the case of restricted release of the site, defines the applicable limitations on use and the party responsible for their maintenance and for ensuring their compliance.

Annex B of this report includes information on the process of licensing for dismantling.

26.1. Dismantling organisation and responsibilities

Section c) of article 2 of the Royal Decree creating ENRESA[25] attributes to the company the responsibility for management of the operations arising as a result of the decommissioning of nuclear facilities.

The operating permit of a nuclear facility having expired, the responsibility for decommissioning is initially to the licensee himself who, prior to granting of the corresponding authorisation, undertakes the so-called pre-dismantling activities.

The licensee of the facility is responsible for conditioning whatever radioactive operating wastes have been generated during the operation of the installation (art. 28 of the RD creating ENRESA). These radioactive wastes are to be conditioned in such a manner that the acceptance criteria of the disposal facility to which they are to be transferred are met.

The licensee of the facility is also responsible for unloading the fuel from the reactor and from the irradiated fuel storage pools or, otherwise, for having available a spent fuel management plan approved by the MITYC, following a report from the CSN (art. 28 thereof).

The type contract between ENRESA and the nuclear power plants, approved by the MITYC, established in greater detail the responsibilities of the licensee and the scope of the work to be performed by him in order to plan the plant dismantling to be performed by ENRESA.

For its part, ENRESA is in charge of submitting the NPP dismantling and decommissioning plan to the MITYC. On completion of the activities previous to dismantling, which are the responsibility of the operations licensee, and following awarding of the corresponding authorisation for dismantling, ENRESA undertakes the responsibility for performance of the dismantling and decommissioning activities scheduled in the authorised plan, as the owner of the facility.

Likewise, on completion of performance by ENRESA of the dismantling and decommissioning plan, ENRESA shall submit to the MITYC a request for the declaration of decommissioning of the facility.

The acceptance by ENRESA of the responsibility for the dismantling of a NPP requires that trusteeship thereof should be transferred to ENRESA by the licensee responsible for the facility during its operation. Following such transfer, ENRESA becomes the licensee of the plant during the performance of the dismantling activities, until such time as the declaration of decommissioning of the facility is awarded, at which moment the freed site is returned to its previous owner, the former licensee of the facility.

The transfer of trusteeship is authorised by the MITYC simultaneously with the authorisation for dismantling, on completion of the activities performed prior to dismantling under the responsibility of the licensee of the facility during the operating phase.

The procedures and mechanisms adhered to in carrying out this transfer of trusteeship of the facility are established contractually between the licensee and ENRESA, its terms being formalised in the so-called *transfer of ownership document*.

---

[25]As has been indicated above, ENRESA was created by RD 1522/84, which has since been annulled. The legal provision currently in force is RD 1349/2003, of October 31st, on the Ordering of ENRESA Activities.

26.2. Financing of dismantling

The dismantling of nuclear power plants and other facilities involved in the manufacturing of uranium concentrates and nuclear fuels is financed through part of the funds that the licensee companies transfer to ENRESA throughout the operating lifetime of their facilities, as payment for the services rendered by the latter pursuant to the Royal Decree by which it was set up.

In this respect, Royal Decree 1899/1984 on the Ordering of fuel cycle activities requires and regulates the contracts that are drawn up between ENRESA and the companies owning this type of nuclear facilities.

In its article 25, "Fund for the financing of activities contemplated in the General Radioactive Waste Plan", Royal Decree Law 5/2005, of March 11th, on Urgent Reforms for the Promotion of Productivity and Improvement of Public Contracting, modifies the electricity industry act, Law 54/1997, of November 27th, in relation to the financing of dismantling activities.

The amounts to be applied to financing of the costs of NPP dismantling and decommissioning attributable to the operation of these facilities as from March 31st 2005 will be provided by the licensees during the operating lifetime of their installations. In this respect, the part considered to be attributable to operation as from March 31st 2005 shall be the proportional part of the dismantling and decommissioning costs corresponding to the operating lifetime of the plant remaining as of that date.

In the case of non-commercial nuclear facilities, such as those involved in research, the payment for the services provided by ENRESA shall be by way of billing.

Section F, article 22 (Human and Financial Resources) of this report includes additional information on the financing system.

26.3. Radiation protection and emergencies during dismantling

Nuclear facilities in the dismantling phase continue to be considered nuclear facilities until the corresponding statement of closure is issued. Consequently, they continue to be subject to a system of inspection and control similar to that applied to the rest of the nuclear facilities throughout the period in which activities for their dismantling are carried out. This control and inspection is the responsibility of the CSN and of the other competent authorities.

What is established in this section on compliance with articles 24 (Operational radiation protection, discharges and non-scheduled and uncontrolled releases) and 25 (Emergency preparedness) of this Convention is fully applicable during the dismantling phase of nuclear facilities.

The site emergency plan applicable during dismantling details the measures foreseen by the licensee and the assignment of responsibilities to respond to accident conditions, in order to mitigate their consequences, protect the personnel of the facility and immediately notify the competent bodies of their occurrence. Like the rest of the official documents, among them the Radiation Protection Manual, the Technical Specifications and the Safety Analysis, this plan is based on assessment of the risk posed by the facility in its new situation of definitive shutdown, and of its evolution on the basis of the activities scheduled for the period prior to transfer of ownership.

26.4. Documentary archive for dismantling and decommissioning

The document by which ownership of the facility to be decommissioned is transferred from the licensee to ENRESA contractually establishes the mechanisms and procedures by which ENRESA has access to all the operating history documents of the facility. As a result, ENRESA is able to access all the available information considered to be of relevance for the design and performance of the dismantling and decommissioning plan for the facility.

The RINR in force includes the obligation that the licensees of nuclear facilities compile and adequately conserve information of relevance to decommissioning throughout the operating phase of their installations. This Regulation requires that the official operating documentation of all nuclear facilities include a document specifically incorporating the measures foreseen for the dismantling and decommissioning of the installation (art. 20 j RINR).

Information on the custody of documents following the decommissioning of the facility is included in Section H of this report, article 17 (Post-closure institutional measures).

In addition, on February 5th 2003 the CSN issued its Instruction IS-04, regulating the transfer, filing and custody of documents covering the radiation protection of the workers, the public and the environment prior to the transfer of ownership of NPP practices performed for their dismantling and decommissioning. This instruction determines what type of documentation should be filed, kept in custody and handed over on stoppage of the practices, prior to the transfer of ownership, with a view to facilitating the dismantling process and ensuring that the documentation in question receives adequate and homogeneous treatment in accordance with the requirements of the Regulation on protection against ionising radiations.

26.5 Assessment of compliance

From what has been said above it may be concluded that Spain meets the requirements of this article of the Convention.

Section G

Safety in the management of spent nuclear fuel

Article 4
General safety requirements

Article 4. General safety requirements

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

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

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

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

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

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

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

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

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

The measures established for compliance with these and other requirements of this Section are, in certain cases, presented differently depending on the stage of management or the current and foreseen situation for the temporary storage of the spent fuel in the short or medium term.

As may be deduced from Section D, sub-section D1 (SF management facilities), the spent fuel generated at the Spanish nuclear power plants is currently stored tempo-

rarily in the pools associated with the nine operating reactors. In addition, in the case of Trillo NPP, whose storage pool would have become saturated in 2003, there is an additional dry storage facility at the plant site, known as the *Trillo individual storage facility* (Trillo ISF), which has been in operation since the year 2002.

Furthermore, as may be gathered from Section B, sub-section B.4.1 (Temporary storage), a new temporary dry storage facility will be built in the near future at the site of José Cabrera NPP, the definitive shutdown of which is scheduled for April 2006 (José Cabrera ISF).

Both the Trillo and the José Cabrera ISF's are based on the use of dual-purpose (storage and transport) casks of American technology, these being metallic in the first case and mixed (concrete and metal) in the second.

Finally, in accordance with the strategies contemplated in the PGRR in force, and in keeping with the resolution of the panel of the Commission for Industry of the Spanish Parliament, ENRESA has initiated the development of a CTS facility, the generic vault-type design of which has been submitted to the CSN for its perusal pursuant to article 81 of the RINR.

Described below are the measures adopted in relation to compliance with the general safety requirements specified in sections i) to vii) of this article.

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

The maintenance of subcritical conditions and adequate heat removal at spent fuel storage facilities are safety requirements that form part of the design basis and criteria. These requirements are incorporated through the application of administrative and technical systems subject to analysis, assessment and surveillance by the CSN.

The description of the measures adopted for compliance with these requirements is contained in the mandatory documentation relating to the process of authorising nuclear facilities in their different phases, specifically in the corresponding safety studies and in the Operating Technical Specifications (OTS's), as indicated in Section E of this report.

The design criteria used for the existing spent fuel *storage pools* take as a reference the standards in force in the country of origin of the design of the nuclear power plants, specifically US 10CFR50 (Appendix B). This is the case for all the plants except Trillo NPP, which is of Siemens/ KWU technology, which is governed by the design criteria issued by the BMI.

The criteria used in the design of the *dry storage facilities* for casks at the Trillo and José Cabrera nuclear power plants, and in the design of the casks themselves, which in both cases are of American technology, are those contained in 10 CFR 72 and in the specific IAEA standards (Safety Series 116 "Design of spent fuel storage facilities").

4.1.1. Measures to guarantee the maintenance of subcritical conditions

The design criterion adopted for the *maintenance of subcritical conditions*, both for the storage of spent fuel in the pools and for its storage in casks, is that the neutron multiplication factor (Keff) be lower than 0.95 under normal operating accident conditions, in the event of uncertainties and in the most reactive situation.

The methods used to maintain subcriticality in the storage pools under normal, abnormal and accident conditions are as follows:

1. Maintenance of a safe geometric configuration,
2. Use of neutron poisons (dissolved in the water or integrated in the structures of the storage racks),
3. Limitation of initial enrichment and credit for the degree of burnup. The application of these methods varies from one facility to the next, as specified below:
    a) As regards the credit given to the degree of burnup of the fuel stored:
        i. At the PWR plants, this was incorporated with the design modification performed to increase the capacity of the pools by replacing the storage racks with other more compact units. As a result of this, the pools were divided into two regions, one (known as region II) designed to give credit to the degree of burnup and housing fuel exceeding a given degree of burnup depending on initial enrichment, and another (known as region I) where both fresh fuel and fuel removed from the reactor core and not reaching the conditions for storage in region II may be stored.
        ii. At the BWR plants, the 5% subcriticality margin is maintained by limiting the initial degree of enrichment of the fuel, by a safe geometric configuration and by incorporating poison into the stainless steel of the storage racks.
    b) The methods used to prevent criticality in the storage casks currently in use at the Trillo NPP storage facility are the incorporation of neutron poison material in the structure of the fuel rack, control of the geometry of the relative positions of the fuel assemblies and limitation of the design basis fuel enrichment to 4% by weight of U235.
    c) The methods used to prevent criticality in the casks proposed for José Cabrera NPP, currently under assessment, are based on the inherent geometry of the rack housing the fuel in the capsule, the incorporation of neutron absorbing panels permanently fixed to the rack, administrative limits on maximum fuel enrichment and a minimum concentration of boron dissolved in the water for loading and unloading of the fuel in the capsule.

4.1.2. Measures to guarantee adequate heat removal

The spent fuel pool cooling systems fulfil the safety functions of removing the decay heat generated by the spent fuel assemblies without exceeding the temperature limits

established and of maintaining a minimum level of water above the spent fuel assemblies in any situation, thus guaranteeing adequate shielding. They are designed to meet the applicable criteria of 10 CFR 50 (2, 4, 5, 44, 45 46, 61 and 63 of Appendix B of 10CFR 50).

The design modification performed in the pools of all the plants between 1992 and 1998, to increase their capacity by replacing the racks with other more compact units, implied analysis and calculation of residual heat and the re-evaluation of the cooling systems. As a result of these re-evaluations, the cooling systems were modified where necessary.

As regards the storage casks, these are designed to give off the heat generated by the fuel assemblies to the atmosphere by means of passive convection, conduction and radiation mechanisms.

In the case of the storage and transport casks currently in use at the Trillo NPP storage facility, known as ENSA-DPT casks and designed to house 21 fuel assemblies, they have a capacity to remove 27.3 kW of heat, although the maximum heat power generated by the fuel does not exceed 24.36 kW. Heat removal is facilitated by the aluminium disks on the rack and by the 36 bimetal stainless steel and copper fins arranged radially on the neutron shielding shroud.

The casks proposed for storage of the fuel from José Cabrera NPP (also known as Zorita) are of the HI_STORM type, equipped with a ventilated metal and concrete structure that allows for cooling of the capsule located inside, which houses 32 fuel assemblies. The original design of these casks has been adapted to the physical characteristics of the fuel of this plant and is currently under assessment by the CSN.

In the case of the CTS facility, the fuel and high level waste storage vaults will be ventilated by a cooling system based on natural air convection, designed such that the structures fulfilling safety functions remain below the temperature limits in order to guarantee compliance with these functions, in accordance with the requirements of the standards considered to be applicable (NUREG-1567 and US. NRC ISG-11, Rev. 2)

4.2. Measures to ensure that the generation of radioactive waste due to spent fuel management is kept at the lowest possible levels

In keeping with the Spanish policy described in Section B of this report, compliance with this requirement is considered to affect both the generation of spent fuel itself and obviously the secondary wastes arising from purification of the water in the NPP spent fuel storage pools, as well as the filters of the pool building ventilation system. The measures in place to reduce the volumes of these materials are as follows:

1. Stretching of the reactor operating cycles to eighteen months, with the corresponding reduction in the amount of spent fuel generated.
2. The habitual practice of providing feedback to the fuel suppliers on the results of analysis of the causes of the findings of irradiated fuel assembly inspection during refuelling activities, with the subsequent improvement of the design and behaviour of the fuel in the reactor, this leading to a lower degree of deterioration of the spent fuel and to a lower level of contamination of the pool water.

3. The additional actions contemplated in the Radioactive Waste Management Plans (RWMP's), a mandatory document for the operation of a nuclear power plant, as indicated in Section E of this report, which include measures to minimise the corrosion of fuel assembly cladding and of the materials stored therein, this also contributing to reducing the contamination of the water in the pool and the secondary wastes resulting from its treatment.

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

The legal and regulatory framework currently existing in Spain does not contain any explicit provisions regarding this safety requirement and its implications for the plans and stages of fuel management, although it does establish the responsibilities and bases for the development of interfaces between the different responsible parties involved which, as may be deduced from Sections A and B of this report, are developed within the framework of the contracts subscribed between the licensees of the nuclear power plants and ENRESA. These contracts contemplate the obligations of both parties and the information on spent fuel to be submitted to ENRESA by the plant owners.

The technical and administrative measures for application of the requirement of interdependence, in order to guarantee the transfer of the spent fuel from one stage of management to the next under optimum safety conditions, have been embedded in the RWMP's on request by the CSN. In accordance with the requirements of the RINR (art. 20 h), these documents, which are obligatory for NPP operation, incorporate the contracts established with ENRESA.

As regards spent fuel, the development and application of these plans are based on the current operational situation of each facility and take into account the foreseen storage period and the specific standards of the IAEA, along with others considered to be of reference. These plans are living documents and as such may be revised in order to incorporate whatever standards and measures might be required in view of in-house experience and international developments in this field. The measures contemplated in these plans include procedures for the following:

1. A clear view of the situation of the detailed inventory of fuel assemblies and activated materials stored, as well as the scope and status of their characterisation.
2. Optimisation of the performance of the spent fuel and of the facility itself.
3. Definition of the objectives and scope of the inspection programme and of the programme for surveillance of the behaviour of irradiated fuels.
4. Definition of additional measures for the characterisation of spent fuels and of the different types of high level wastes, necessary for compliance with the requirements of subsequent stages or modes of management.
5. Compilation and analysis of in-house experience of storage, identifying those safety-related aspects that need to be revised, especially those relating to the above and to the corresponding recording and filing systems, taking into account future documentary needs.

6. Monitoring of developments in the country of origin of the technology, identifying applicable R&D activities and projects and determining needs to address in-house projects or participate in international projects in order to ensure adequate understanding of fuel behaviour.

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

As has been pointed out in Section E of this report, the legal framework existing in Spain in the nuclear field includes a set of provisions for the protection of persons and the environment against the risks posed by nuclear and radioactive facilities. These are applicable to spent fuel management facilities, both those associated with the nuclear power plants and other independent installations, since the latter are treated as nuclear facilities with a limited operating period.

The measures adopted to ensure that the exposure of workers to radiations is kept at the lowest level reasonably achievable have been described in Section F of this report, article 24 (Operational Radiation Protection).

Particularly significant among the measures adopted by the CSN for application of the ALARA criterion, and impacting the operation of spent fuel storage pools, is CSN Safety Guide 01.05 "Documentation on refuelling activities at light water reactor nuclear power plants". This has allowed insight to be gained into the collective dose associated with each refuelling activity since it was published, including doses arising as a result of irradiated fuel inspections. These measures became obligatory with the issuing of CSN instruction No IS-02 of April 10th 2002, revised in 2004, which regulates refuelling activities at nuclear power plants.

CSN Guide 1.12 on the Optimisation of Radiation Protection at Nuclear Power Plants may also be considered to be applicable.

As regards measures for the control and surveillance of effluents, like the previous measures these are integrated in general NPP measures covering this area, which are governed by CSN Safety Guide 1.4 on the "Radiological control and surveillance of liquid and gaseous radioactive effluents emitted by nuclear power plants".

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

The prevention of risks other than radiological risks associated with the operation of spent fuel management facilities is regulated by the standards common to other industrial activities implying such risks. As has been pointed out in Section E, these consist basically of the legislation on the assessment of environmental impact, which transposes Community Directives.

Furthermore, the prevention of non-radiological risk to the operations personnel of these facilities is regulated by Law 31/1995 on the Prevention of Occupational Risk.

Finally, in relation to the above, it is provided that those events that, in the opinion of the licensee, may 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 permissible for the generations of the present

This principle does not have a direct impact on the spent fuel management facilities currently existing in Spain, since these are temporary storage installations.

As regards the additional temporary storage facilities considered in the General Radioactive Waste Plan (PGRR) currently in force, although their operating period and service lifetime are not defined they may be considered to be limited, like other nuclear facilities, for which reason the principles of radiation protection currently in force for the public would in principle be applicable.

The current legal framework covering the nuclear field guarantees the protection of the public throughout the normal operating periods of the existing spent fuel management facilities, and that of others foreseen; however, it does not contain provisions for the protection of future generations if the lifetime of such facilities were to be extended or prolonged beyond the said periods.

As regards the strategy of disposing directly of spent fuel in geological formations, as waste, the current legislative framework does not contemplate measures to limit long-term repercussions. The only provision in this respect is the dose and risk criterion defined by the CSN in 1987 in its decision on the First PGRR, as specified in sub-section 11.6 of Section H of this report (art. 11, general safety requirements).

4.7. Measures to prevent undue burdens on future generations

As has been indicated in the previous section, this requirement does not in principle have a direct impact on the spent fuel management facilities currently existing in Spain, since these are temporary storage facilities associated with the nuclear power plants or constructed on their site, as a result of which they have a limited lifetime and are subject to the system of periodic revision of the operating permits of the plants themselves.

As regards the solutions for the medium and long-term management of spent fuel contemplated in the 5th PGRR currently in force, the burdens for future generations inherent to the time periods involved in developing these solutions would relate fundamentally to the assignment of responsibilities, the provision of funds for financing of the activities involved and forecasts regarding institutional surveillance and control requirements.

In relation to these aspects, the current legal framework assigns ENRESA the responsibility for ensuring the long-term management of all facilities serving for the storage of waste and spent fuel and contemplates the constitution, application and management of the economic fund for its financing.

4.8. Assessment of compliance

From what has been said in each of the previous sections it may be stated that Spain meets the requirements relating to the maintenance of conditions of subcriticality and heat removal and that it possesses a legal framework appropriate for the safe operation of the currently existing spent fuel management facilities as regards protection for the workers, the public and the environment.

Likewise, the legal framework establishes the bases for consideration of the interdependencies between the different stages of management and minimisation of the wastes resulting from the management of spent fuel, although the application of these principles may require additional actions, which are currently under study. In any case, work is on-going for a more detailed definition of policies and strategies dealing with solutions for the long-term management of fuel.

Article 5
Existing facilities

Article 5. Existing facilities

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

5.1. Changes to existing facilities

The storage facilities currently existing are those referred to at the beginning of this Section and detailed in Section D of this report (Inventories and lists). Between 1991 and 1999 the capacity of the fuel storage pools was increased by replacing the original racks with other high density units made from borated aluminium, allowing for a more compact storage arrangement. The replacement was performed completely in all the pools, with the exception of region I at José Cabrera and Trillo, the Eastern region of the spent fuel pool at Cofrentes and boraflex region II at the Vandellós II nuclear power plant, in which the original racks have been maintained.

In each case, this operation, planned and performed as a plant design modification, was subject to the corresponding modification request and authorisation, in accordance with the RINR.

The CSN assessed the structural aspects and those relating to criticality and the generation and removal of residual heat, along with the capacity of the pool cooling systems and the forecasts for handling of the fuel and the radiological consequences of the process during normal operation of the plant and operational radiation protection measures during the reracking operations (ALARA) for the new conditions.

As a result of the assessments performed, certain modifications were required to the pool cooling systems, with the incorporation of additional heat exchangers and other minor modifications to the pool cooling circuits at several plants. In all these cases the new

configuration of the pool is within the safety limits, both structural and subcriticality-related, and the cooling system is in all cases capable of removing the maximum thermal load following the performance of the necessary modifications.

As regards the dry storage facility at Trillo NPP, in operation since 2002 and with a capacity for 80 metallic casks, the licensee has recently submitted a revision of the Safety Analysis with a view to being able to store casks containing fuel with a higher degree of burnup that that initially considered.

This modification is based on the approval, issued in 2004, that extends the use of the ENSA- DPT cask to include fuel having a higher degree of burnup and a longer cooling period than those initially specified (40,000 MWd/tU and 5 years cooling), these now being open to use for fuel of up to 45,000Mwd/tU and 6 years cooling.

The assessment performed by the CSN has included an exhaustive review of the thermal and criticality analyses of the casks. The incorporation of this extension to the operation of the storage facility implies checking of the modifications made to the mandatory documents, specifically in the Safety Analysis and the Operating Technical Specifications.

5.2. Measures adopted for revision of the safety of the existing facilities

The examination of the safety of the pools is included in the on-going safety review programmes of the nuclear power plants, aimed at maintaining the level of safety required by the authorisations and at improving it in accordance with the progress in technology and new legislative requirements. Specifically, the analysis of operating experience is undertaken through the Periodic Safety Review performed for each facility every ten years.

In addition, specific review programmes have been carried out with respect to the pools themselves, with specific objectives regarding certain aspects or generic objectives regarding their operating situation.

General inspection programmes have also been carried out on all the pools, these serving as a basis for the preparation of the directives on the content of the Management Plans (RWMP's) required as part of the mandatory documentation for the operation of nuclear facilities.

The RWMP's are based on analysis of the operating situation of the pools and the surveillance and control status of the fuel and the facilities and, taking into consideration their expected lifetime, apply the requirements of the Convention, the specific standards of the IAEA and others of recent development, taken as a reference to optimise the performance of the facilities and reinforce all aspects relating to the subsequent transfer of the spent fuel to other stages of management under the best conditions of safety.

These plans, approved at the end of 2003, are being implemented under the supervision of the CSN, which has initiated an inspection programme to verify their degree of implementation. Likewise, the CSN has initiated developments for the drawing up of a guideline on the application of such plans.

5.3. Assessment of compliance

From what has been said above it may be deduced that the existing spent fuel storage facilities present the characteristics necessary for their safe operation and that measures have been applied to meet the general safety requirements arising as a result of ratification of the Convention applicable to the existing facilities.

Article 6
Siting of proposed facilities

Article 6: Siting of proposed facilities

1. *Each Contracting Party shall take the appropriate steps to ensure that procedures are established and implemented for a proposed spent fuel management facility:*
   i. *to evaluate all relevant site-related factors likely to affect the safety of such a facility during its operating lifetime;*
   ii. *to evaluate the likely safety impact of such a facility on individuals, society and the environment;*
   iii. *to make information on the safety of such a facility available to members of the public;*
   iv. *to consult Contracting Parties in the vicinity of such a facility, insofar as they are likely to be affected by that facility, and provide them, upon their request, with general data relating to the facility to enable them to evaluate the likely safety impact of the facility upon their territory.*
2. *In so doing, each Contracting Party shall take the appropriate steps to ensure that such facilities shall not have unacceptable effects on other Contracting Parties by being sited in accordance with the general safety requirements of Article 4.*

The aspects relating to the siting of new installations shall be analysed differently in the case of the CTS facility, foreseen for the year 2010 – where the selection of a completely new site is foreseen – or that of an ITS facility associated with an NPP. In this latter case the approaches will also be different depending on whether the facility is constructed during the operation of the plant, as is the case for the Trillo ITS facility and the future facility of this kind at José Cabrera, or once the plant has definitively shut down.

6.1. Measures to assess all factors relating to the site and having an influence on safety

Aspects relating to the site are taken into account throughout the entire process of authorisation (i.e., on issuing the preliminary authorisation, the construction and operating permits, authorisation for modifications and the authorisation for decommissioning). A detailed description of the license issuing procedure is included in Annex B of this report. Bearing in mind the type of spent fuel management facilities existing in

Spain and those foreseen, the most relevant steps are the preliminary and modification authorisations.

During the phase of preliminary authorisation, these aspects are of major importance since this authorisation constitutes official recognition of the project and formal acceptance of the site proposed; in other words, this authorisation is in practice a real *authorisation of the site.*

As regards authorisation for modifications to the facility, the aspects relating to the site are relevant when the modifications proposed have an impact on any factor relating to the use of the land or the site conditions initially foreseen.

In the process of licensing nuclear facilities, the CSN may subordinate its approval to the fulfilment of certain conditions by the licensee. In this way, the CSN adapts to each specific case the general criteria established in the standards of the country of origin of the project, which in a sense constitutes the development of specific standards for each facility. When the licensee of an authorisation performs the actions established, the CSN once again assesses their acceptability and may impose new conditions upon the licensee or even suspend the authorisation granted.

The assessment activities are complemented by others involving inspection, since at any time the CSN may, through inspections and audits, verify the compliance status of a requirement imposed or the truthfulness of the information included in the documents submitted by the licensee for review.

The Spanish NPP's have implemented Surveillance Programmes covering basic site parameters that allow their performance to be continuously monitored. These programmes are dynamic and are specifically adapted to each site and facility, their results being documented and submitted for CSN assessment in periodic reports.

Their implementation by the plant licensees and the performance of studies and analyses relating to site safety are in keeping with the forecasts and have allowed progress to be made in reasonably improving the safety of the nuclear power plants.

As a result of the review by the CSN of the studies included in the Periodic Safety Review activities, the seismic surveillance systems have been updated at all the nuclear power plants and the hydrogeological surveillance programmes have been improved.

The periodic results of the surveillance programmes have been revised and continuous supervision has been maintained through appropriate inspections. A specific periodic inspections plan has been implemented for each NPP (Basic Inspection Plan) and, within this plan, a procedure has been established for the detailed review of information on the site and extreme meteorological conditions.

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

The only spent fuel management facility constructed subsequent to the corresponding NPP is the Trillo NPP temporary cask storage facility. This facility has been constructed on the site of the plant and arrangements for its authorisation have been dealt with as a modification to the installation.

At the Trillo facility an analysis has been performed of events representative of altered and abnormal conditions that might occur during its service lifetime and that would im-

ply the risk of release to the atmosphere of the activity contained in the fuel assemblies. Likewise, a study has been made of the radiological consequences of conceivable events implying very low levels of activity with very low or non-quantifiable probabilities of occurrence. From these analyses it has been concluded that there is no need to adopt additional preventive and/or protective measures for the facility, since the NPP radioactive effluents discharge limits are not altered by the new installation.

6.3. Public information on the safety of the facilities

The results of the inspection and assessment activities performed by the CSN must be made available to the public pursuant to three sets of provisions:

1. The legal provisions regulating the process of awarding licences,
2. The Environmental Impact standards,
3. Law 38/1995, of December 12th, on the right to access to environmental information.

Within the framework of the licensing process it is obligatory that an announcement be published in the Official State Gazette and in the corresponding Autonomous Community Gazette informing of the objective and the main characteristics of the facility. This announcement shall establish that those persons and entities that consider themselves to be affected by the project may submit whatever written allegations they deem to be appropriate to the corresponding Delegation of the Government within thirty days. The arrangements relating to public information are dealt with jointly with those foreseen for the Environmental Impact Study in its specific regulation. Once the thirty-day public information period has expired, the Government Delegation carries out the appropriate checks on both the documentation submitted and the written allegations and issues a report, sending the file to the MITYC with a copy to the CSN.

Furthermore, the standards require that during the construction, operation and dismantling of the NPP's there be an "information committee", a body whose functions are to inform the different entities represented of the development of the activities regulated in the different authorisations and jointly deal with matters of interest to these entities. This committee is made up of personnel of the central, regional and local Administrations.

Annex B of this report describes the process of licensing nuclear and radioactive facilities, and its last section includes more specific information on public participation in this process.

6.4. International agreements

Article 37 of the Euratom Treaty imposes the requirement that general data on all radioactive waste disposal projects, regardless of type, be provided to the European Commission, thus making it possible to determine whether the performance of such projects might give rise to the radioactive contamination of the waters, soil or air space of another member State. In development of this article, it has been recommended[26] that

[26] *Reference to the Recommendation of the European Commission of December 6th 1999 on application of Article 37 of the Euratom Treaty (1999/829/EURATOM).*

such data be submitted one year, and in no case less than six months, before granting of the operating permit by the national authorities. As a result, the supply of such data has become one more of the licensing requirements described.

6.5. Assessment of Compliance

The information on site parameters drawn up during the different stages of licensing in accordance with the standards in force provides a reasonable guarantee of the safety of spent fuel management facilities.

Likewise, the licensing process and the regulations in force contemplate both the issue of public information and the mechanism of assessment by the European Commission of the possible impact on other member States of the disposal of radioactive waste from a nuclear facility.

Consequently, it may be deduced that Spain has adopted the measures necessary to comply with the requirements of article 6 of the Convention.

Article 7
Design and construction of facilities

Article 7. Design and construction of facilities.

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

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

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

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

The only spent fuel management facilities in existence are the storage pools at the operating nuclear power plants and the cask dry storage facility at Trillo NPP.

The pools at all the NPP's have been assessed and authorised within the licensing process of the plants themselves, as a result of which the design requirements and limits and operating conditions are part of the authorisations granted to the licensees. Furthermore, the extension of the spent fuel storage capacity at the NPP's, either through re-racking of the pools or through the use of metallic casks in the Trillo NPP storage facility, has been proposed, evaluated and authorised as a modification to the facility within the framework of the plant operating permits in force.

7.1. Measures for the granting of authorisations

The process of granting authorisations is described in Annex B of this report. Especially relevant for this article are the construction permit and the authorisation for the performance of modifications.

As regards the construction permit, the RINR specifies all the documentation that should accompany the corresponding request, particularly significant among which is the Preliminary Safety Analysis. This should include the criteria, codes, standards and provisions used in designing the facility. The format and content of this document are based on the three following fundamental principles:

- ✓ Consideration of the criteria and specifications contained in the Ministerial Order by which the preliminary authorisation is granted to the facility analysed.
- ✓ Attention to the applicable national standards and to the appropriate recommendations of the international institutions, fundamentally the IAEA, of which Spain is a member and, in the absence of the latter, to the set of standards in force in the country of origin of the design.
- ✓ Where appropriate, accurate monitoring of the details of the reference facility.

The documentation that is required to accompany requests for construction permits should include the following:

1. Technological, economic and financing forecasts for dismantling and decommissioning.
2. Periodic reports to the CSN with details of the progress of the project in relation to issues affecting nuclear safety, as well as of whatever incidents and variations might have taken place. In addition, the CSN inspectorate performs generic and specific visits.
3. A pre-nuclear test study, including the general tests referred to in the RINR and those specific to each case, which are described in the Ministerial Order by which the construction permit is granted. The satisfactory performance of the pre-nuclear verification and its formal acceptance by the CSN mark the completion of the construction authorisation process.

This study, along with the rest of the documentation submitted, is evaluated by the CSN, which then draws up a report along with a proposal for resolution governing the activities of the licensee during the construction process.

Requests for modification authorisations are to be accompanied by the following documentation:

1. Technical description of the modification, identifying the underlying reasons for it.
2. Safety analysis.
3. Identification of the documents that would be affected by the modification, including the texts proposed for the SA and the OTS's, where applicable.
4. Identification of tests to be performed prior to re-initiating operation.

The following documentation should be provided along with the request for authorisation for the performance and assembly of the modification when required by the na-

tional authorities as a result of the scope of the modification or of the necessary construction and assembly works:

1. General description of the modification.
2. Standards to be applied in the design, construction, assembly and testing of the modification.
3. Basic design of the modification.
4. Organisation foreseen and quality assurance programme for project performance.
5. Identification of the scope and content of the analyses required to demonstrate the compatibility of the modification with the rest of the facility and guarantee that its levels of safety will continue to be maintained.
6. Destination of the equipment to be replaced.
7. Acquisition plan and budget in the case of major modifications.

7.2. Technologies used for Spent Fuel Storage

More than 50 years of experience of storage in pools has been accumulated. In the case of light water reactors having spent fuel with Zircaloy and zirlo cladding, there would appear to be no time limit applicable to this method of storage, unless adverse water chemistry conditions occur potentially contributing to deterioration by corrosion of the cladding, which constitutes the first barrier for the radioactive material as regards its confinement.

Dry storage takes place typically in casks having an additional shroud of metal, concrete or some other material providing shielding and structural support against external demands. Some of these casks are used both for storage (outdoors or in a building) and for transport of spent fuel.

The technology selected in Spain for the case of Trillo NPP is based on the use of metallic dual-purpose (storage and transport) casks. Their design is based on multiple walls (stainless steel – lead – stainless steel – neutron shielding – stainless steel) and guarantees the confinement of the system by controlling maintenance of the pressure in the space between the two main cask covers or closure heads. These casks are temporarily stored at the plant itself in a facility constructed for this purpose.

The technology selected for José Cabrera NPP is based on the use of welded metallic capsules that are placed inside metal-concrete or totally metallic modules for storage and transport, respectively. These casks will be temporarily stored at the plant itself in an outdoor facility constructed for this purpose.

7.3. Assessment of compliance

From what has been said above, it may be deduced that Spain has adopted the measures necessary to comply with the requirements of this article of the Convention, since the Spanish legislation includes a formal procedure for authorising the construction and modification of nuclear facilities, this covering review of the design, the surveillance of construction and verification of the suitability of the works performed through a programme of pre-nuclear tests.

Article 8
Assessment of the safety of the facilities

Article 8. Assessment of the safety of the facilities

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

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

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

8.1. Legal and regulatory requirements

The construction and operation of spent fuel storage facilities are subject to the system of licensing of nuclear facilities described in Section E of this report. Licensee requests for such authorisations must necessarily be accompanied by the corresponding safety analyses, with the content specified in each case depending on the type of authorisation in question (construction, operation or modification).

Furthermore, article 80 of the RINR of 1999 establishes that the manufacturing of casks for the storage of spent fuel will require approval of their design, following a mandatory report by the CSN. Although the legislation does not specify the documentation to be submitted in this case, the precedent of the safety analysis has been established in practice, with approval of the design of the ENSA-DPT cask, authorised for the spent fuel storage facility at Trillo NPP, as detailed in the following section.

Finally, given its relationship with the request submitted by ENRESA for the CSN report on the generic design of the CTS facility, mention is made of the fact that article 81 of the RINR contemplates the issuing of a favourable declaration by the CSN for new generic designs or methodologies relating to the safety or radiation protection of the facilities or activities referred to in the RINR, for which reason requests are required to be accompanied by the necessary documentation. This declaration may be subsequently referred to in the licensing process foreseen in the RINR as long as the limits and conditions imposed by it have been fulfilled.

Each of the safety analysis referred to generally contains the analyses required to demonstrate compliance with the safety functions and design criteria of the facilities under normal and accident conditions, accompanied by a study of the consequences or radiological impact.

As regards the environmental assessment referred to in this article of the Convention, it is pointed out that in accordance with the Spanish legislation in this area the assessment of non-radiological environmental impact is associated with the preliminary or site authorisation, as has been explained in Section E and may be deduced from Annex B of this report.

As may be deduced from the functions attributed to the CSN by the law by which it was created, the documentation submitted by the licensee, and specifically the safety analyses presented for the construction and operating permits, are in all cases systematically assessed by the CSN for issuing of its mandatory report prior to the granting of such authorisations.

8.2. Process of licensing of existing facilities

The licensing of the pools associated with the design of the nuclear power plants is integrated into the process of licensing the plants themselves and is currently subject to the Periodic Safety Review Process.

The modifications to the design or operating conditions carried out in the pools have been performed in accordance with the provisions of the applicable legal framework and have been subject to a specific process of authorisation when this has been required. Particularly significant among the affected design modifications subject to authorisation has been the replacement of the original storage racks with other more compact units in order to increase storage capacity, performed generally in the pools of all the operating plants between 1991 and 1998. The requests for these modifications were accompanied by the corresponding safety analyses and a list of the affected documents.

The licensing of the Trillo cask storage facility, initiated in February 1996, was undertaken as a plant design modification, in accordance with the procedures established in this respect in article 25 of the RINR, following submittal of the SA. The authorisation for start-up of the facility, awarded in May 2002 following a favourable report by the CSN, was preceded by approval of the revision of the plant OTS's and the SA to include the modifications deriving from implementation of the previously approved storage casks and the storage facility, as well as other mandatory documents affected.

The same process is being adhered to for the storage facility that will be constructed on the site of José Cabrera NPP. In both cases the design of the cask storage facility and the corresponding SA are based on the characteristics of the cask proposed, previously approved in accordance with the provisions of article 80 of the RINR.

As regards the ENSA-DPT casks currently in use at the Trillo storage facility, these have been designed for the storage and transport of spent fuel. Consequently, and in view of the fact that the licensing requirements for storage and transport are clearly separate and differentiated, the licensing process has been carried out in two different areas for each of the necessary approvals:

1. Approval of the design for storage, in accordance with the requirements of the RINR.
2. Approval of the B(U) type package for transport, in accordance with the applicable Spanish transport regulation.

The evaluation of the corresponding safety analyses and technical specifications has been carried out in accordance with the standards of the country of origin of the technology, specifically NUREG 1536[27] and NUREG 1745[28] respectively, in addition to the specific IAEA standard.

[27] *Standard Review Plan for Dry Casks Storage System.*

[28] *Standard format and Content for the Technical Specifications for 10CFR 72 Cask Certificate of Compliance.*

This same procedure is currently being applied to assessment of the design and use of the cask proposed for the ITS facility of José Cabrera NPP. In both cases the process is similar overall to that used in the country of origin of the technology and adheres to the procedures, requirements and format of 10 CFR 72 for the so-called Certificate of Compliance.

Additionally, it may be pointed out that the manufacturing of the cask is subject to a quality assurance programme and tracked by the CSN through inspections performed to verify compliance with the design specifications and quality procedures, as well as the verification tests carried out on the first two casks manufactured.

8.3. General framework of safety assessments and analyses

The Final Safety Analyses submitted by the licensees of the nuclear power plants contain several sections dedicated to the spent fuel storage facilities. Section 9.1.2, "Spent Fuel Storage", of NUREG-0800, "Standard Review Plan", has been used for their analysis and assessment, along with other applicable sections. In the case of the Trillo nuclear power plant, the technology of which is German in origin (*Kraftwerk Union Aktiengesellschaft*), information on storage is included in the Final Safety Analysis and the criteria of the standards of that country have been used, contrasted for assessment with the aforementioned requirements.

As regards the storage casks, the final safety analysis adheres to the format of NUREG-1536 and includes a general description of the cask, the main design criteria, a structural assessment, thermal assessment, assessment of the shielding and a criticality analysis, as well as the operating procedures, acceptance criteria and maintenance procedures, protection against radiations, a chapter on accident analysis, another on quality assurance and one corresponding to the operating limits and conditions drawn up in accordance with the aforementioned NUREG document.

In the case of the dry storage facilities for spent fuel based on the use of casks, the procedure and requirements implemented have been those of 10 CFR 72[29] article 212, applicable to nuclear power plants licensed in accordance with 10 CFR 50, due to the similarity of the two cases.

Finally, in assessing the safety analysis submitted along with the request for approval of the generic CTS facility design, consideration is being given to the requirements of the Joint Convention, NUREG- 1567[30] and the specific IAEA standard, especially to those contained in Safety Series 116, 117 and 118, in keeping with the phases of development of the installation.

The documentation is in all cases evaluated by the CSN in order to verify compliance with the acceptance criteria of the reference standard applicable in each case, prior to the issuing of its decision for the corresponding approvals.

---

[29] *Licensing requirements for the independent storage of spent nuclear fuel, high level radioactive waste, and reactor-related greater than class c waste.*

[30] *Standard Review Plan for Spent Fuel Dry Storage Facilities.*

8.4. Assessment of compliance

The legal framework existing in Spain for the licensing of facilities requires the performance of safety assessments during the phases of construction and operation referred to in this article of the Joint Convention, these having been carried out systematically for the existing facilities, thus creating the basis for application to other future installations. As a result, Spain may be said to reasonably meet the requirements of this article.

Article 9
Operation of facilities

Art. 9 Operation of facilities

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

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

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

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

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

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

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

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

9.1. Operating permit: limits and conditions. Operating experience

The spent fuel storage pools of all the nuclear power plants currently in operation have been evaluated and authorised as part of the process of licensing the plants themselves; consequently, the design requirements and operating limits and conditions included in the safety and environmental assessments are part of the Operating Permits granted to the licensees on completion of the start-up programme (pre-nuclear and nuclear testing programme) demonstrating that the facility, as built, meets the design and safety requirements.

Furthermore, and as has been pointed out above, the dual-purpose metallic cask storage facility at Trillo NPP has been proposed, evaluated and authorised as a design modification within the framework of the Operating Permit in force for the plant itself, adhering to the same licensing process as used for the original authorisation.

The Operating Permit in force allows the licensee to own and store slightly enriched fuel assemblies, in accordance with the technical limits and conditions contained in the Refuelling SA for each cycle and with the limits and conditions associated with the Specific Authorisations for the storage of fresh and irradiated fuel.

The NPP procedures contemplate the analysis of in-house and industry operating experience possibly leading to actions for improvement in design aspects and operating procedures. Among the reports analysed are those generated by INPO/WANO, the US-NRC and vendors.

Operations with spent fuel at the nuclear power plants are carried out in accordance with the OTS's and the RWMP, both of which are mandatory documents.

The OTS's establish the Limiting Conditions for Operation, the applicability, the necessary actions and the surveillance requirements necessary for compliance with the limiting conditions. They also contain the limit values for variables affecting safety, the actuation limits for automatic protection systems, the minimum operating conditions, the programme of revisions, calibration and periodic inspections or testing of various systems and components and their operational control.

In order to develop and detail the OTS surveillance requirements, surveillance procedures are drawn up and implemented by the different departments involved in plant operation.

9.2. Operating, maintenance, radiological surveillance, inspection and testing procedures

The nuclear power plants have in place various procedures that regulate the performance of the different activities relating to the operation, maintenance, radiological surveillance and inspections of the structures, systems and equipment that form part of the spent fuel storage facilities.

The facilities possess detailed inventories of the fuel assemblies arranged in the spent fuel pools, with the following information on each of the assemblies stored therein:

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

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

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

9.3. Engineering and technical support services

The nuclear power plants possess engineering and technical support services facilitating compliance with and verification of the safety criteria in spent fuel storage areas, within the scope described in their Operating Regulations.

The contracts subscribed with the manufacturers and/or suppliers of nuclear fuel contemplate technical support in relation to the fuel assemblies supplied, this including transfer of the characteristics and design of the assemblies, the operating limits for the guarantee of the fuel and the drawings and data required by the NPP as a result of the contracts established between the plant and the companies providing irradiated fuel services (ENRESA, irradiated fuel transport, storage, etc.).

9.4. Reporting of events

The nuclear power plant OTS's establish the conditions under which special reports have to be submitted whenever incidents of significance for the safety of the spent fuel storage facilities occur.

The CSN and the competent state authorities are to be notified of Reportable Events by way of the format included in Appendix II, III or IV of the CSN Safety Guide GSG-1.6. Special reports are to be submitted to the CSN as established in the OTS's.

In addition, the CSN is responsible for the inspection and control of the operation of the NPP's and in this respect is empowered to perform inspections in relation to nuclear safety and radiation protection. During 2003, the CSN performed 283 inspections of all types, in addition to which each plant has two resident inspectors.

9.5. Decommissioning

As established in the RINR (Section E), the NPP licensees draw up, and update when necessary, the decommissioning plans for spent fuel management facilities, using the information acquired throughout their operating lifetime. These plans are examined by the regulatory authority.

9.6. Assessment of compliance

From what has been said above it may be deduced that the operations performed at spent fuel management facilities in Spain fulfil the characteristics required to ensure compliance with the different measures required by this article of the Convention.

Article 10
Disposal of spent fuel

Art. 10. Disposal of spent fuel

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

As has been indicated in Section B of this report, the different PGRR's have contemplated deep geological disposal as constituting the definitive solution for the spent fuel from the operating light water reactors. However, the 5th PGRR currently in force postpones any decision regarding a final solution until the year 2010. The studies currently on-going combine deep geological disposal with analysis of the impact that the techniques of separation and transmutation might have in the future on such disposal, in terms of the volume and radiotoxicity of the source term to be disposed of.

Section H

Safety in the management of radioactive waste

Article 11
General safety requirements

Article 11. General safety requirements

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

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

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

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

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

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

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

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

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

11.1. Measures to ensure the maintenance of conditions of subcriticality and heat removal

The measures in place to guarantee the maintenance of conditions of subcriticality at the currently existing spent fuel temporary storage facilities, located on the NPP sites, have been described in Section G of this report. By their very nature, the other types of

waste are not susceptible to reaching criticality, with the exception of the fissionable materials recovered from the reprocessing abroad of Spanish fuel, these not currently being located in Spain.

As regards measures to guarantee heat removal, the situation is similar to that described above: the measures adopted at the existing spent fuel temporary storage facilities are as described in Section G of this report. Of the wastes mentioned, only the vitrified HLW currently in France generates significant amounts of heat, a fact that will have to be taken into account when its is returned to Spain.

11.2. Measures adopted to ensure that the generation of radioactive waste is kept at the lowest possible level

Although there are no specific requirements in the Spanish law obliging the producers of low and intermediate level waste (LILW) to minimise the amounts produced, the principle of minimisation in production has in practice been promoted by the CSN through requirements for action applied to ENRESA in relation to optimum use of the capacity of the El Cabril definitive disposal facility.

These requirements have led the nuclear power plants and ENRESA to make joint efforts in recent years to reduce the volume of LILW generated at the Spanish plants. These efforts are governed by an Agreement reached within the framework of the UNESA-ENRESA Parity Commission and signed in June 1994, which has translated into joint analysis tasks and investments in specific projects.

The implementation of these volume reduction projects has allowed annual production figures to be reduced from the 6,500 waste packages (1,430 m^3) generated in 1990 to the approximately 2,700 packages (600 m^3) currently generated by the seven operating nuclear power plants.

Significant joint efforts have been made also between ENRESA and the radioactive facilities to reduce the amounts of radioactive waste generated. During the period 1992 to 2003 the annual volume of waste removed from these producers was reduced to half, decreasing 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 an appreciable reduction in waste generation, to the current values of around 35 m^3 per year. Furthermore, during the period 1992 to 2004 the contracts between ENRESA and the RF's have increased from 400 to the 700 currently in force, while the number of RF's authorised in the country has remained practically identical. This group of producers has been joined by those arising as a result of application of the Protocol on collaboration in the radiological surveillance of metallic materials.

Figure 5 shows the reduction in the production of LILW arising from the operation of Spain's nuclear power plants. Mention should be made of the fact that in order to achieve this reduction, ENRESA has invested more than 9 million euros in volume reduction projects at the NPP's, within the framework agreement established for this purpose between ENRESA and UNESA.

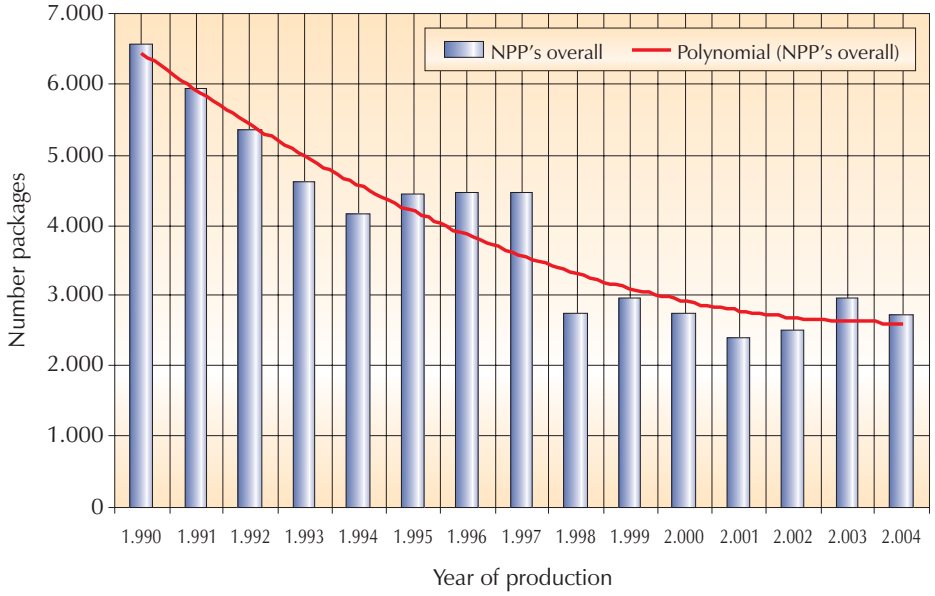


Figure 5. Annual generation of LILW packages at the NPP's.

11.3. Measures adopted to take into account the interdependencies between the different stages of radioactive waste management

Regarding the management of LILW, the main objective of all the technical-administrative operations associated with the management of radioactive waste is to limit exposures to radiation affecting the operating personnel and the public and to minimise the possible long-term effects on the environment and for future generations.

With this aim in mind, the requirements made of an overall radioactive waste management system, and of its components and the final products, are defined in terms deriving from the conditions of safety and radiation protection established by the Spanish regulatory authority.

The stages of LILW management carried out at the Spanish nuclear power plants are subject, among other things, to the process of regulatory licensing performed prior to their operation. During this process, the licensee is specifically required to draw up and apply the so-called Process Control Programme (PCP) in the operation of the systems for conditioning of the wastes for their final disposal.

Prior to initiating the operation of disposal facilities, ENRESA is required to establish specifications for the acceptance of waste packages at such installations.

The waste acceptance criteria are designed to guarantee the safety of the facility in the short, medium and long term, constituting the reference to be taken into account by the waste producers in the definition of new 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 per-

mit for the El Cabril Disposal Facility currently in force, granted by Ministerial Order on October 5th 2001, determines that the waste acceptance criteria of this facility are part of the official operating documents.

The CSN required ENRESA to draw up a methodology for the acceptance of waste packages at the El Cabril Disposal Facility, along with a set of technical and administrative procedures for its practical implementation, affecting both the relationship between ENRESA and the waste producers and activities of exclusive ENRESA responsibility in the acceptance of different types of waste packages.

ENRESA has established an acceptance methodology for the El Cabril LILW disposal facility that implies the performance of a process of characterisation and acceptance, following the appropriate tests, of the different types of waste packages from the different producers, with surveillance based on inspections on reception, documentary and in-the-field controls on waste production and the performance of scheduled verification tests on the actual packages received.

An appropriate acceptance process will be implemented with the same objective at the projected VLLW waste disposal facility.

Ministerial Order ECO/1449/2003 (Official State Gazette No 134 of 05/06/2003) specifies the different aspects to be taken into account in the management of radioactive waste from 2nd and 3rd category radioactive facilities involved in medicine, industry or research.

11.4. Measures to ensure efficient protection of persons, society and the environment

The provisions of the Spanish regulations that refer to the protection of persons and the environment are included in Section E of this report.

The Spanish nuclear legislation and regulations establish mechanisms for the direct protection of persons and the environment. However, the different stages of radioactive waste management, and especially their definitive disposal, are to be analysed from the point of view of deferred safety, since the radiological risk remaining for persons and the environment will require control over long periods of time.

The non-existence of Spanish legal precepts in relation to safety and radiation protection in the long term has been made up for – especially as regards the low and intermediate level waste disposal facility – with the direct application of the safety principles and criteria emanating from the international organisations, on the one hand, and, on the other, with the specific application of the safety requirements established in the standards of other countries for the regulation of facilities having similar technological concepts, which have served as a reference for the safety assessment of the Spanish installations.

The safety principles and criteria relating to radioactive waste management recommended by international organisations such as the International Commission on Radiological Protection and the International Atomic Energy Agency have occasionally been incorporated specifically as conditions for the construction and operation of waste management facilities.

As regards the incorporation of safety requirements established in the standards of other countries, the regulatory authorities have imposed certain operating conditions on the LILW surface disposal facility, using as a reference the safety requirements applied at installations of similar technology existing in other countries (France, United Kingdom, United States).

11.5. Measures for consideration of biological, chemical and other risks potentially associated with radioactive waste management

The presence in LILW of substances whose toxicity and potentially hazardous nature are associated with causes other than ionising radiations is an unarguable fact. However, the Waste Act, Law 10/1998, of April 21st, excludes from its field of application (Art. 2) radioactive wastes regulated by the LEN.

From this legislative point of view, measures to protect the workers, the public and the environment against biological, chemical or other risks are specifically applied in the management of radioactive wastes potentially implying such risks, but with consideration given in the first instance to the radiological risk associated with the wastes. Section E of this report refers to the process of the environmental impact statement to which nuclear facilities are subject prior to their operation.

Additionally, as a preventive measure, limitations are established on the content of chemical or biological substances that might be present in the LILW disposed of at the El Cabril facility.

Among others, the waste acceptance criteria applied at the aforementioned disposal facility include restrictions relating to the minimisation of substances whose main potential risk arises from origins other than radioactivity and those able to produce exothermal chemical reactions.

The responsibility for declaring the presence of toxic, chemical or biological substances in radioactive waste is to the producers, who are required to minimise the production of such substances and identify them in order for ENRESA to be able to draw up an inventory of the amounts of certain components at the facility. This issue is dealt with by working groups made up of technical personnel from ENRESA and the NPP's.

11.6. Measures to avoid repercussions on future generations greater than those permitted for the present generation

As has already been pointed out, the Spanish nuclear legislation currently lacks any specific provision on the control of radiological risk in the long term, and the standards relating to the safety principles and criteria to be met by waste management facilities over timescales different from the normal operating periods have yet to be developed.

This legislative shortcoming has obliged the competent authorities to issue specific statements in those cases in which it has been considered necessary to establish measures to protect the generations of the future with a view to preventing impacts greater than those considered acceptable for the present generation.

The criteria issued by the CSN in its Six-Monthly Report to the Spanish Parliament on December 31st 1985 are in line with the above. According to these criteria:

> *The basic objective of radioactive waste disposal facilities, from the point of view of nuclear safety and radiation protection, is to guarantee that radioactive waste is isolated from mankind and the environment in such a manner as to prevent potential releases of nuclides from giving rise to unacceptable exposure to radiation for people.*

In addition, the criterion defined by the CSN for situations of long-term waste disposal facility exposure, in its Decision on the Proposal for the 1st General Radioactive Waste Plan (PGRR), in 1987, establishes as follows:

> *The level of individual risk used shall be lower than 10-6 /year, or the risk associated with an annual equivalent dose to individuals in the critical group lower than 0.1 mSv.*

Avoiding the occurrence of actions that might have unacceptable repercussions for the generations of the future implies the planning and implementation of preventive measures in an uncertain context, as a result of which the analysis of the uncertainties involved in the long-term behaviour of radioactive waste disposal systems and in evaluating their consequences is an aspect habitually considered.

11.7. Measures adopted in an attempt to prevent undue burdens for future generations

The measures adopted relate fundamentally to the assignment of responsibilities, the setting up of funds for financing of the activities involved and provisions regarding the needs for institutional controls. In this respect, the current legal framework establishes the responsibilities of ENRESA, assigning to it the specific function of ensuring the long-term management of all facilities serving for the disposal of waste and spent fuel, and provides mechanisms for the constitution, application and management of the economic fund for its financing.

The specific measures adopted in the case of the El Cabril LILW disposal facility are related to the concept of passive safety adopted during the stage of the lifetime of the installation that will follow its closure. Passive safety consists of the facility's not depending on continuous and large-scale active measures following closure, but rather of its being subject to active and passive institutional controls reinforcing safety and ensuring compliance with the safety criteria specified by the regulatory authorities.

Additionally, Royal Decree Law 5/2005, of March 11th, on Urgent Reforms for the promotion of Productivity and the improvement of Public Contracting establishes that the State shall assume the ownership of radioactive wastes once they have been definitively disposed of and responsibility for whatever surveillance might be required following the decommissioning of nuclear or radioactive facilities, following the time period established in the corresponding authorisation for such decommissioning.

11.8. Assessment of compliance

In view of what has been pointed out in each of the sections, Spain is considered to meet the general safety requirements established in article 11 of the Convention.

Article 12
Existing facilities and past practices

Article 12. Existing facilities and past practices

Each Contracting Party shall in due course take the appropriate steps to review:

i) the safety of any radioactive waste management facility existing at the time the Convention enters into force for that Contracting Party and to ensure that, if necessary, all reasonably practicable improvements are made to upgrade the safety of such a facility;

ii) the results of past practices in order to determine whether any intervention is needed for reasons of radiation protection bearing in mind that the reduction in detriment resulting from the reduction in dose should be sufficient to justify the harm and the costs, including the social costs, of the intervention.

12.1. Measures adopted to examine the safety of the El Cabril facility

The El Cabril LILW disposal facility is the only one of its kind existing in Spain as of the date of entry into force of the Convention.

The underlying concept of the El Cabril facility is that of a surface waste disposal installation with engineered barriers.

At present, the El Cabril nuclear facility has an operating permit that will remain valid until such time as the volume available for LILW disposal in the existing cells has been completed, this having been granted by the Ministerial Order of October 5th 2001.

12.1.1. Periodic safety reviews

The operating permit for El Cabril establishes a system of Periodic Safety Reviews (PSR's), with a performance frequency of ten years.

The PSR's do not replace the analysis, control and surveillance activities that are carried out continuously at the El Cabril Disposal Facility, but are aimed at providing an overall assessment of the safety and radiation protection of the facility, at analysing the experience acquired and at establishing the licensee's commitments to implementing possible improvements, taking into account the current situation and whatever new technological or regulatory circumstances might arise.

ENRESA submitted the first El Cabril PSR to the competent authorities in December 2003, analysing the period that had elapsed between the operational start-up of the installation (1992) and the authorisation in force.

12.1.2. Regulatory activities for the control of safety and radiation protection at the El Cabril disposal facility

One of the functions of the CSN is to undertake assessment, inspection and control of the El Cabril disposal facility, in order to ensure compliance with the standards and conditions established in the installation's operating permit.

The documentation submitted by ENRESA during the aforementioned authorisation processes, and that corresponding to the PSR's, is assessed and analysed by the CSN, which may require whatever clarifications, justifications and details it deems to be appropriate. For the detailed review of the calculations performed by the operator, the CSN may carry out alternative calculations or verification inspections at the offices of the engineering forms responsible for their performance.

ENRESA submitted a revision of the El Cabril disposal facility's SA with a view to incorporating the updated results and conclusions of the long-term safety analysis, in accordance with the Complementary Instructions issued by the CSN in this respect in 2001.

In 2003, ENRESA requested a modification of the El Cabril facility for the construction and operation of a very low level waste disposal installation. The safety criteria applicable to the design and construction of the new installation were previously approved by the CSN, in June 2003. The design of the barriers is based on the technical requirements established by the European Union for the disposal of wastes classified as hazardous. This installation is currently in the licensing phase.

12.1.3. Surveillance and control programmes

The operating permit for the El Cabril disposal facility establishes that the licensee shall be obliged to measure the efficiency of the surveillance, control and inspection practices in place at the facility against previously established objectives, such that there be assurance that the structures, systems and components having an impact on safety and radiation protection during the operation of the facility and in the long term are capable of fulfilling their design function and that their performance is as specified in the design bases, in accordance with the complementary instructions issued by the CSN.

A process has now been implemented at the El Cabril disposal facility covering the surveillance, control and inspection actions undertaken at the installation.

12.2. Measures adopted to examine the safety of low and intermediate level waste management at the Spanish nuclear facilities

12.2.1. Treatment, conditioning and temporary storage of LILW

The LILW treatment and conditioning installations existing at the nuclear power plants are based on the processes of cementation of moist solids and of compacting dry compressible solids to reduce their volume. Recently, desiccation plants have been in-

stalled at some nuclear power plants for concentrates and sludges, these having allowed important reductions to be achieved with respect to the original waste volumes.

The examination of the safety of the LILW management installations 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 keeping with technological progress and the new standards requirements.

Also in place at the Spanish nuclear facilities is a ten-year Periodic Safety Review (PSR) programme that includes analysis of the operating experience of waste management systems and the improvement processes foreseen.

Furthermore, the mandatory Radioactive Waste Management Plan (RWMP) has as an objective the inclusion of criteria and instructions ensuring that the management of the radioactive wastes generated at these facilities be safe and optimised, with consideration given to standards developments and taking into account the following:

- ✓ The current situation regarding the production, management and, where appropriate, disposal of the wastes.
- ✓ Identification of the origins of the wastes.
- ✓ Study of management system and process alternatives and of improvements to such systems and processes.
- ✓ Justification of the suitability of current management practices or of the need for improvements to be implemented.
- ✓ Planning of studies for the implementation of the improvements identified.

The new developments promoted by the CSN for the RWMP have consisted of the drawing up of methodology guidelines to facilitate the preparation of documents at each facility, as well as the development of a pilot RWMP for the José Cabrera NPP.

The process initiated in relation to the RWMP's is currently in the phase of final conclusions, on the basis of the experience acquired and the possible improvements analysed for their potential implementation. The CSN inspects, watches over and controls the storage facilities in order to verify compliance with the safety requirements established.

12.2.2. Safety in the management of very low level waste open to conventional management through clearance

In accordance with the legal framework and taking into account the fundamental courses of action for the management of very low level waste via conventional routes (declassification) adopted by the countries of the European Union, the CSN has considered the basic principles on which the Spanish declassification system should be based to be as follows:

- ✓ Responsibility of the producer.
- ✓ Traceability of the process of managing declassifiable materials.
- ✓ Intrinsic safety of all processes carried out on the materials once declassified.

The declassification system adopted in the case of the nuclear facilities is based on the drawing up of Common Projects for the management of the different waste materials

and serving to determine appropriate declassification levels, taking into account the peculiarities of and the standards applicable to the management of conventional wastes in Spain.

The system is completed with the authorisation for declassification specific to each nuclear facility and to each stream of waste materials.

As a result, the declassification of waste materials having radioactive contents is configured as an administrative authorisation preceded by a process of decision-making in relation to subsequent management, such that the latter may be undertaken without any type of radiological restriction.

In general, each stream of very low level waste materials selected should be covered by a project common to all the Spanish NPP's, which shall be submitted to the CSN for approval. Following such approval, each licensee interested in declassifying a stream of waste materials shall request a specific authorisation, demonstrating compliance with the technical conditions established in the common project.

To date the CSN has approved declassification and determined the conditions under which it should be performed in the cases of used oils (by combustion and regeneration), metallic materials, used activated carbon (except its regeneration) and spent ion exchange resins.

Furthermore, the former Ministry of Economy specifically authorised the declassification of used oils with very low levels of activity generated at the Trillo, Cofrentes, Almaraz and Santa Mª de Garoña nuclear power plants, of activated carbon at Trillo and Almaraz, of metallic scrap at José Cabrera NPP and of spent resins at Trillo NPP, following a report by the CSN.

Regulatory efforts focus on improving the processes of characterisation and on implementing methodologies in this area allowing for optimisation of the resources required for performance without reducing the quality demanded.

12.3. Measures adopted to examine the safety of low and intermediate level waste management at the Spanish radioactive facilities

The management strategies for solid radioactive wastes generated at the Spanish 2nd and 3rd category radioactive facilities are based on temporary storage for the radioactivity to decay to levels such that the wastes may be managed as conventional materials outside the radiological regulatory framework. Nevertheless, radioactive waste removal operations are also carried out by ENRESA for transfer to the El Cabril facility for conditioning and definitive disposal at this installation.

Ministerial Order ECO/1449/2003 (Official State Gazette No 134 of 05/06/2003) was published in June 2003. Referring specifically to 2nd and 3rd category radioactive facilities at which non-encapsulated radioactive isotopes are handled or stored, this Order determines the technical and administrative requirements for the management of solid waste materials with radioactive contents under suitable conditions of safety and radiation protection in all its phases, from their generation to their final destination.

12.4. Past practices relating to low and intermediate level waste management

As of the entry into force of the Convention, there are no low and intermediate level waste management facilities in Spain that have been decommissioned in the past and that might be the subject of decisions regarding intervention to reduce the existing radiological detriment.

12.5. Assessment of compliance

In view of what has been pointed out in each of the sections of this article, it is considered that Spain has adopted suitable measures to examine the safety of its existing waste management facilities.

As regards the El Cabril waste disposal facility and the waste management installations existing at the nuclear power plants, their operating permits establish the obligation to implement a system of periodic safety reviews (PSR's) in order to continually assess safety and radiation protection at the facilities, analyse the experience acquired and evaluate the potential improvements that might be implemented.

Furthermore, the Spanish standards establish a series of safety and radiation protection control activities, assigned to the CSN in order to ensure compliance, and in addition the operating permits of the El Cabril disposal facility and of other Spanish nuclear facilities oblige the licensees to continuously measure the efficiency of their surveillance, control and inspection practices against previously established safety objectives.

Article 13
Siting of proposed facilities

Article 13. Siting of proposed facilities

1. *Each Contracting Party shall take the appropriate steps to ensure that procedures are established and implemented for a proposed radioactive waste management facility:*
   - i. *to evaluate all relevant site-related factors likely to affect the safety of such a facility during its operating lifetime as well as that of a disposal facility after closure;*
   - ii. *to evaluate the likely safety impact of such a facility on individuals, society and the environment, taking into account possible evolution of the site conditions of disposal facilities after closure;*
   - iii. *to make information on the safety of such a facility available to members of the public;*
   - iv. *to consult Contracting Parties in the vicinity of such a facility, insofar as they are likely to be affected by that facility, and provide them, upon their request, with general data relating to the*

facility to enable them to evaluate the likely safety impact of the facility upon their territory.

2. *In so doing, each Contracting Party shall take the appropriate steps to ensure that such facilities shall not have unacceptable effects on other Contracting Parties by being sited in accordance with the general safety requirements of Article 11.*

Since the end of 1992, the *LILW ge*nerated by the NPP's and by other producers have been stored at the El Cabril installations, in accordance with the limits and conditions established in the operating permit of that facility.

Having realised that the management of very low level waste (VLLW) at the existing El Cabril facility implied a loss of the strategic value of the capacity of the installation, a process has been initiated to modify the facility in such a way as to make available an area set aside specifically for the management of this type of waste. As has been pointed out in Section B, the decision to undertake such construction dates back to resolutions by the Commission of Economy and Finances of the Spanish Parliament in 2001 and 2002.

The issue of VLLW management having been solved, the additional needs of storage capacity for the system are determined by two aspects:

1. The volume reduction programme currently under way at the NPP's,
2. The future dismantling of the NPP's.

As regards the management of *HLW* and *SF*, and as has been explained in Section B, a centralised storage facility is expected to be built by the year 2010. Definitive disposal is expected to take place in a deep geological facility, if the Government sees fit as from that year.

13.1. Criteria for assessment of site-related factors influencing safety

a) LILW

The criteria and factors taken into account for the El Cabril Disposal Facility, and presented during the process of licensing the installation prior to its start-up in 1992, are representative of the assessment methodology and systematic approach 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 the potential releases of radionuclides, which in turn depends on the physical and chemical form of the wastes stored and on the action of the natural and artificial barriers opposing their migration.
- ✓ The nature of the release, depending on the quantities and types of radionuclides contained in the waste.

These factors were taken into account in the SA for the El Cabril disposal facility. The assessment was performed in keeping with the specific standards applicable to the reference installation, which, due to its being French, was 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 operation and surveillance phases;
- ✓ During the phase of unrestricted use, it is based on limitation of the inventory and on the characteristics of the geological barrier.

Also taken into account were the two fundamental criteria that any site for this type of facilities should provide: isolation with respect to underground and surface waters and control of releases of activity in the event of assumed failures.

This Rule also established the design lifetime of the waste isolation devices (engineered barriers) at a maximum 300 years. Consequently, it is estimated that the surveillance and control phase at the El Cabril Disposal Facility should not exceed this period. Nevertheless, the duration of this phase will be re-evaluated in the light of the activity actually stored at the end of the operating phase, lower than the envelope considered in the radiological impact assessment.

The VLLW installation whose construction is currently being addressed at El Cabril constitutes a modification within the design plans of the Disposal Facility. Pursuant to the Spanish standards, an in particular the RINR, its construction requires an authorisation for modification of the previously existing installation.

Among the documentation supporting the request for authorisation, the SA foreseen for the new installation includes appropriate information on the criteria for assessment of factors influencing safety.

The following suitability criteria have been taken into account in weighing the characteristics of the site:

1. Suitable lithological characteristics,
2. Low seismic activity and tectonic stability
3. Known and controllable hydrogeology
4. Known hydrogeochemistry
5. Smooth or smoothable topography and absence of potential flooding
6. Suitable geotechnical properties
7. Conservation of potentially usable areas in extension of the installations
8. Availability of sufficient information on the site
9. Accessibility and communications
10. Proximity to current installations

b) HLW

As has been indicated in Section B of this report, any decision on the final situation regarding the management of HLW and spent fuel has been put off until the year 2010. As in other countries, the sensitivity of the public towards

this type of facilities becomes a critical condition when addressing the issue of choosing a site.

Until such time as definitive management methods are established, all activities aimed at focussing on or selecting specific sites have been suspended. In the meantime, work is limited to maintaining and developing the geological information available in the country, in order for it to be of use in the eventual selection process whenever a decision is taken.

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

a) LILW

When the El Cabril Disposal Facility safety analysis was performed, an important part of it was dedicated to assessment of the potential radiological impact of the site during the three operating phases of the facility:

- ✓ In the operating phase, activities relating to waste handling and treatment were studied.
- ✓ In the phases of surveillance and control and unrestricted use, consideration was given to situations relating to the behaviour of the facility itself.

Analyses were performed on scenarios of normal operating and accident situations, as well as of human intrusion during the phase of unrestricted use. In general, the selection of specific hypotheses for each of these situations was accomplished by maximising the doses to the critical individual, such that the situations may be considered as being the most penalising from the point of view of impact, establishing a maximum level for this variable.

As in the case of the previous facility, the VLLW installation seeks to comply with safety objectives oriented towards the protection of persons and the environment.

The SA for the VLLW installation has been performed in a manner coherent with that previously carried out for the El Cabril Disposal Facility, using the same criteria and methodology and the same total inventory of activity, since the activity in question is a modification to the existing facility and does not imply any variation to the maximum authorised radioactive inventory. The SA covers the operational and post-operational phases. As in the case of the previous SA, the situations analysed include present and future conditions, events associated with the normal evolution of the disposal facility and more unlikely events such as intrusion. The analysis has two objectives:

- ✓ The formulation of VLLW acceptance criteria for their definitive management.
- ✓ Demonstration of an acceptable level of protection for human health and for the environment in the present and the future.

The methodology for its performance is based on that established in international forums, such as the ISAM and ASAM projects promoted by the IAEA, and has the following main elements:

- ✓ The context of the study, identifying the timeframe, objectives, radiation protection and safety criteria, etc.
- ✓ The description of the system or of the characteristics of its components: waste, operating practices, design of the facilities, etc.
- ✓ The development and justification of scenarios and their evaluation. These scenarios serve the two aforementioned objectives.
- ✓ Results analysis.

b) HLW

As has already been pointed out, Spain has no facility for the definitive disposal of HLW.

Among other things the work performed to date has allowed for the development of generic designs of the disposal system for each geological medium studied (granites, salts and clays), as well as the development and preliminary application of tools and methodologies for assessment of performance and safety in the long term.

Both ENRESA and the CSN continue their programmes of R&D and of the evolution of the different aspects relating to deep geological disposal, through both international programmes and bilateral agreements with other countries.

13.3. Public Information of the Safety of the Facilities

In view of the fact that Section E and Annex B explain the process of public information contemplated in the Spanish regulations, this section will describe the experience acquired in applying the standards in the specific case of the El Cabril VLLW installation.

A large part of the public hearing procedures involved in the process of authorising facilities are articulated in Spain around the Environmental Impact Assessment. The El Cabril VLLW installation is subject to such assessment by virtue of Annex I of the Law regulating Environmental Impact Assessment (EIA)[31].

Arrangements for the licensing of the El Cabril VLLW installation began when ENRESA submitted the Preliminary Safety Analysis to the CSN and the MITYC in May 2003, and the following month the respective documentation to the Ministry of the Environment, in order for the EIA process to begin. The environmental impact assessment was submitted to the Ministry of the Environment in September 2004, thus initiating the process of public consultation foreseen by the standards.

13.4. International Arrangements

Spain's experience as regards compliance with art. 37 of the Euratom Treaty for radioactive waste disposal projects is limited to the arrangements made prior to the granting of the operating permit for the El Cabril facility in 1992.

[31] *Law 6/2001, of May 8th, modifying legislative Royal Decree 1302/1986, of June 28th, on Environmental Impact Assessment; Official State Gazette No 111, of May 9th 2001.*

13.5. Assessment of Compliance

It may be deduced from the above that Spain has adopted the measures necessary to meet the requirements of article 13 of the Convention.

As has been indicated, the regulatory framework does not currently contain provisions relating to the process of designating sites for the definitive management of spent fuel and HLW, for which different initiatives are being analysed.

Article 14
Design and construction of facilities

Article 14. Design and construction of facilities.

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

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

ii. at the design stage, conceptual plans and, as necessary, technical provisions for the decommissioning of a radioactive waste management facility other than a disposal facility are taken into account;

iii. at the design stage, technical provisions for the closure of a disposal facility are prepared;

iv. the technologies incorporated in the design and construction of a radioactive waste management facility are supported by experience, testing or analysis.

The LILW management facilities currently existing in Spain are located at the installations generating such waste or at the El Cabril facility, where their disposal is carried out. The first such facilities have been evaluated and authorised within the process of licensing of the said installations, as a result of which this article will focus mainly on the El Cabril disposal facility.

14.1. Limitation of possible radiological consequences for people, the environment and society

According to the RINR (art. 12), the construction permit is what allows the licensee to initiate the construction of a facility and request the operating permit. In the case of new facilities, this application is to be submitted to the competent authorities accompanied by a series of documents, outstanding among which is the Preliminary Safety Analysis (PSA).

The El Cabril facility obtained its construction permit by Ministerial Order on October 31st 1989. The corresponding request had been submitted in May 1988 pursuant to the RINR then in force[32] 1988, although subsequently, in April 1989, a Revision 1 of the Gen-

[32] *Decree 2869/1972, of July 21st; the RINR RINR currently in force was approved by RD 1836/1999, of December 3rd.*

eral Project and the PSA was issued, incorporating the criterion of retrievability of the wastes, agreed on following several meetings with the regulatory authorities.

The PSA performed for the El Cabril Disposal Facility included the design principles of the facility, with consideration given in its conceptual design to the experience acquired in other countries having such installations (especially at the French La Manche and L'Aube facilities) and on the basis of the fundamental safety-related objectives and technical options.

As established in the construction permit, the *general safety objectives* defined for the El Cabril facility were as follows:

- ✓ Immediate protection for people and the environment during the operating phase and deferred protection during the phases of surveillance and control and unrestricted use.
- ✓ Allowance of unrestricted use of the site in a reasonable time, that is to say, the possibility of using the land for any purpose without any restrictions being imposed by the installation.

One of the objectives imposed and included in the construction permit for the facility was that of zero releases, as a result of which the design is based on the reuse of liquid radioactive wastes in the different conditioning processes. This criterion extends to both the buildings area and to the disposal cells, for which the facility is equipped with the respective collection, treatment and conditioning systems.

Compliance with the objectives is accomplished through the application of certain *basic criteria,* which in the case of the El Cabril facility are as follows:

1. Isolation of the radioactivity stored from the surroundings (or biosphere) during the operating and surveillance and control phase, thanks to the suitability of the site and the different elements of the installation.
2. Limitation of the activity of the radionuclides present in the disposal units, such that the radiological impact be acceptable under any foreseeable circumstances and that the residual activity be compatible with unrestricted use of the site.
3. Straightforward retrievability of the wastes disposed of, due to the incorporation of disposal units allowing for handling of the wastes and their inclusion in cells without any type of structural union.

As has been pointed out in previous sections, the construction of the new VLLW disposal installation at El Cabril has been addressed as a modification to the previously existing facility, and has been planned on the basis of the same safety criteria as applied to it. Consequently, the basic safety criteria for this installation are the same as those described above for the Facility, although the technology used and the conditions have been adapted to the type of wastes considered and the associated risk.

Furthermore, the arrangements for the modification licence established the need to perform a series of tests, as defined in art. 25 of the RINR. These tests affect the VLLW disposal area and handling building.

14.2. Technical Provisions for the Decommissioning of Radioactive Waste Management Facilities

The nuclear power plants currently operating in Spain achieved their construction permits during the 1960's (first generation plants: José Cabrera and Sta. Mª. de Garoña. Vandellós I is in the dismantling phase), the 1970's (second generation plants: Almaraz I and II, Ascó I and II and Cofrentes) and the last groups at the end of the 1970's and beginning of the 1980's. All the operating plants are based on light water technology (PWR and BWR) of proven validity.

The RINR of 1972 did not contemplate any provision for the future decommissioning of the facilities during the design and construction stage. However, the RINR approved in 1999 introduced as a requirement for application for the construction permit the need for the documentation to be submitted to include technological, economic and financing forecasts regarding dismantling and decommissioning.

Even before this legislative gap was bridged through the reform of the RINR, the third generation plants incorporated in their construction permit a description of the "resources incorporated in the project to facilitate decommissioning of the facility" as one of the safety limits and conditions. In compliance with this condition, "the licensee is required to take into account the national standards in force, those recommended by the international organisations to which the Spanish State belongs and those appropriate standards that might have been developed in the country of origin of the design."

The other two nuclear facilities, the Juzbado manufacturing facility and CIEMAT, which have radioactive waste management plants or units, applied the standards in force at the time, i.e. the 1972 RINR, during their construction permit process.

14.3. Technical Provisions for Decommissioning of the Radioactive Waste Disposal Facility

The PSA for the El Cabril facility, submitted with a view to obtaining the construction permit, already included the systems designed for decommissioning of the installation and those that are required to remain operative throughout the phase of surveillance and control.

At the end of the operating phase of the facility, decommissioning activities will be carried out to prepare the installation for the next phase. It will be necessary to complete the disposal works and annexes (covering, seepage networks), remove and disassemble those operating installations (constructions and equipment) that will no longer be required and install all those elements required for the surveillance and control phase that are not already in place.

Following the operating phase, the waste conditioning installations will be decontaminated and dismantled. In order to facilitate this task, all areas susceptible to contamination are equipped with decontaminatable coverings. Likewise, the equipment is designed for easy decontamination (choice of materials, installation of motors outside sensitive areas, etc.). Furthermore, the conceptual design of the different areas allows for the disassembly of heavy equipment (tanks, etc.).

The design objectives of the surveillance devices and the relevant actions to achieve compliance with them may be summarised as follows:

1. Checking of disposal cell integrity

   For this purpose, ENRESA will retain ownership of the land, thus preventing any deterioration as a result of uncontrolled human intervention and ensuring the surveillance and maintenance of the covering, the seepage control network and the surveillance devices.

   On completion of the operating phase, and prior to initiating the phase of surveillance control, the disposal cells, now filled and closed, are protected against the effects of the weather through the installation of a long-term covering, designed and constructed such that the maintenance required under normal conditions is minimised and protection is afforded against erosion, water and temperature changes.

   The seepage control network, which will operate throughout the phases of operation and surveillance and control with minimum maintenance, is designed to easily identify and locate any possible anomaly in any of the disposal cells. For this purpose, the network piping has been installed in accessible underground galleries of reinforced concrete that run longitudinally beneath the cells and has been designed with sufficient inclination and dimensions to ensure drainage by gravity to the final control tank. Each cell is individually linked to the network via a transparent surveillance vat with a sampling point, to which it will be connected once the cell in question enters the operating phase, protected against rainwater (mobile roofing structure).

2. Environmental radiological surveillance in the area surrounding the facility.

   For this purpose an Environmental Radiological Surveillance Programme will be drawn up, which will be subject to approval by the authorities before decommissioning can begin. This Programme will be based on the experience acquired, the checks performed and the resources used during the operating period.

As regards the new VLLW installation integrated into the El Cabril facility, a surveillance phase is foreseen following decommissioning, followed by a post-surveillance phase during which records are assumed to be lost, and consequently the use for any application. During the first of these periods, the performance of the disposal system will be monitored for some 30 years, followed by a period of passive surveillance. The maximum duration adopted for the surveillance period is 60 years, although given that the installation in question is located at El Cabril, a longer period might be considered.

14.4. Technologies used for Radioactive Waste Management

Nuclear power plants

The radioactive waste management facilities existing at the Spanish NPP's were designed and constructed as part of the plants themselves in accordance with the standards applied at the reference plants in 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.

At certain of the plants modifications were subsequently introduced to improve the treatment or conditioning of the different streams of operating waste and to increase the capacity of the available temporary storage installations.

El Cabril disposal facility

As has been pointed out above, the conceptual development of the Disposal Facility was based on the experience acquired in countries possessing this type of installations and the establishment of basic safety objectives and technical options. Following consideration of the above, the option adopted was that of the surface disposal model with engineered barriers, the concept developed using the French disposal facilities as a reference.

Before the start-up of the El Cabril facility, and in accordance with the RINR of 1972, the installation was subjected to a pre-operational verification programme that included tests and checks aimed at guaranteeing the correct operation of the different installations and equipment, from the point of view both of nuclear safety and radiation protection and of the applicable industrial and technical regulations.

Likewise, for the new VLLW installation the regulations in force will be applied, that is to say the 1999 RINR.

14.5. Assessment of Compliance

The Spanish legislation includes a formal procedure for the awarding of construction permits for nuclear facilities that includes a review of the design, the surveillance of construction and verification of the suitability of its performance through a programme of pre-nuclear tests, the results of which are subject to approval by the CSN.

The design and the technologies used at the radioactive waste management facilities existing in the country have been developed in keeping with the national and international safety regulations and standards, as well as with widely recognised and used standards applicable in this area.

In view of the above, the contents of article 14 of the Convention are deemed to have been fulfilled.

Article 15
Assessment of safety of facilities

Article 15. Assessment of safety of facilities

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

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

ii) in addition, before construction of a disposal facility, a systematic safety assessment and an environmental assessment for the period following closure shall be carried out and the results evaluated against the criteria established by the regulatory body;

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

15.1. Measures adopted prior to the construction of low and intermediate level radioactive waste management facilities

The LILW management facilities existing in Spain are the treatment plants and temporary storage installations located at the NPP's, at the Juzbado fuel manufacturing facility and at the CIEMAT "Juan Vigón" Centre and, as a centralised installation including the disposal of this type of waste, the El Cabril facility.

In accordance with the RINR in force, all these facilities are classified as nuclear or radioactive. In view of their characteristics, the El Cabril centre is considered to be a nuclear facility while the rest are classified as radioactive facilities. Section E and Annex B of this report include detailed information on the process of authorising nuclear and radioactive facilities.

Before undertaking the construction of a waste management facility, and in the case of its category being that of a nuclear facility, the licensee must have obtained a preliminary authorisation. The licensee will also have to obtain a construction permit pursuant to the RINR prior to operation of the facility.

One of the documents that the licensee is required to submit in support of his request for a construction permit is the Preliminary Safety Analysis (Art.17 of the RINR).

15.2. Measures adopted prior to the construction of low and intermediate level radioactive waste disposal facilities

In Spain, the facilities for the definitive disposal of LILW are nuclear facilities, as a result of which the system of authorisations and safety assessments indicated in Section E will be applicable to them prior to their construction.

Although the RINR does not explicitly mention aspects relating to the safety of radioactive waste disposal facilities, in the practice of licensing the El Cabril facility (the only one of its kind in Spain), the interpretation has been that all the requirements relating to the safety of the installation should be taken into account, as regards both the operating phase and the phase that will begin following its closure.

As regards the project for the new very low level waste (VLLW) disposal installation, ENRESA requested authorisation for the modification of the current El Cabril facility.

The modification authorisation for this facility is governed by the provisions of article 25 of the RINR, it having been provided that prior to the operating permit for the VLLW dis-

posal installation, a specific authorisation should be sought for the construction and assembly of the new disposal systems. The said construction and assembly authorisation is currently in the environmental impact statement phase.

15.3. Measures adopted prior to the operation of low and intermediate level radioactive waste management facilities

As has been pointed out above, the authorisations required by nuclear and radioactive facilities to initiate their operations are included in Section E and Annex B of this report, a sequential authorisation process having been established in which each authorisation is regulated specifically.

Once the licensee of a nuclear facility has the construction permit and has carried out the pre-nuclear tests, he is in a position to request the operating permit for the facility from the competent authorities.

Article 20 of the RINR indicates that applications for an operating permit for nuclear facilities are to be accompanied by a series of documents that will, where appropriate, update the contents of those submitted when requesting the construction permit. One of these documents is the Safety Analysis (SA), which should contain the information required for analysis of the facility from the point of view of nuclear safety and radiation protection, along with analysis and assessment of the risks posed by operation of the facility under both normal operating and accident conditions.

15.4. Assessment of compliance

The Spanish legislation establishes a sequential authorisation process in which each authorisation is regulated specifically and that establishes the licensee's obligation to submit whatever safety analyses are specifically required of him. In accordance with the provisions of each of the sections of this article, and as regards LILW, it is considered that Spain has adopted adequate measures to assess the safety of the waste management and disposal facilities prior to their construction and previous to their operation.

Article 16
Operation of facilities

Art. 16 Operation of facilities

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

i) the licence to operate a radioactive waste management facility is based upon appropriate assessments as specified in Article 15 and is conditional on the completion of a commissioning programme demonstrating that the facility, as constructed, is consistent with design and safety requirements;

ii) operational limits and conditions, derived from tests, operational experience and the assessments as specified in Article 15 are defined and revised as necessary;

iii) operation, maintenance, monitoring, inspection and testing of a radioactive waste management facility are conducted in accordance with established procedures. For a disposal facility the results thus obtained shall be used to verify and to review the validity of assumptions made and to update the assessments as specified in Article 15 for the period after closure;

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

v) procedures for characterization and segregation of radioactive waste are applied;

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

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

viii) decommissioning plans for a radioactive waste management facility other than a disposal facility are prepared and updated, as necessary, using information obtained during the operating lifetime of that facility, and are reviewed by the regulatory body;

ix) plans for the closure of a disposal facility are prepared and updated, as necessary, using information obtained during the operating lifetime of that facility and are reviewed by the regulatory body.

16.1. Waste management at nuclear and radioactive facilities

16.1.1. Operating permit: limits and conditions. Operating experience

The RINR establishes that, having received the report from the CSN and following the other corresponding decisions and reports, the MITYC shall adopt the appropriate resolution on all types of authorisations for all nuclear and radioactive facilities.

The data and documentation to be included by the licensee in requesting the different authorisations have been specified in Section E and Annex B of this report. As is indicated in the said section, the RINR determines the operating permit application process to be adhered to by the licensees of radioactive and nuclear facilities and, in relation to the former, distinguishes between those involved in the nuclear fuel cycle and those others that have scientific, medical, agricultural, commercial or industrial ends.

1. The following may be underlined as regards the radioactive facilities:

    a) For radioactive facilities involved in the nuclear fuel cycle, the requesting of, arrangements for and granting of authorisations are regulated in the same way as established for nuclear facilities, with the corresponding documents being adapted to the special characteristics of these installations.

b) In the case of other radioactive facilities, the request is to be accompanied by a descriptive report on the facility, the safety analysis, a verification of the installation, the operating regulations, a list of the personnel foreseen, the organisation and definition of responsibilities, the site emergency plan and forecasts regarding decommissioning and the planned economic coverage.

The dismantling and decommissioning of each radioactive facility is specifically the responsibility of the licensee. The request for the declaration of decommissioning shall be accompanied by the following documentation: a decommissioning technical study indicating the inventory of radioactive materials and waste, and their destination, and the measures taken to dismantle, and where appropriate decontaminate, the facility, and an economic report including the cost of decommissioning and the corresponding financing arrangements.

Before being granted by the competent authority, the operating permits and performance of restoration plans for the restoration of uranium mines will require the mandatory and binding report by the CSN on radiation protection.

2. As regards nuclear facilities, the operating permit is granted provisionally for the period required to carry out the nuclear testing programme, in order to be able to assess the nuclear safety of the facility and analyse the results. Following this, and having received the report with the CSN's opinions regarding the results of the tests, the possible modifications to be made to the OTS's and the conditions for renewal of the authorisation, the MITYC will issue the new operating permit for the corresponding period. The annex to the operating permits contains the limits and conditions to be met by the NF's during their operation, some requiring immediate compliance and others requiring compliance within a fixed period.

   Furthermore, the RINR establishes that the request for the operating permit of a nuclear facility should include a radioactive waste management plan (RWMP), incorporating, where appropriate, the contracts subscribed with management companies and including, among other items, a system for possible declassification and a study of the dismantling and decommissioning forecasts. This study should explain the final arrangement foreseen for the wastes generated and include a study of the costs and the economic and financial arrangements to guarantee decommissioning.

   During 2002 and 2003, the CSN has evaluated and approved the RWMP's of all the Spanish nuclear facilities. During the first quarter of each calendar year the licensees are required to submit a report on the activities of the plan to the Directorate General for Energy Policy and Mines and to the CSN. The objective of the RWMP of each facility is to improve the management of the wastes produced. The licensee is required to update the waste inventory, minimise production, recycle and attach value to the wastes produced, to the extent that this is technically and economically possible, and condition the final waste materials for disposal.

   The set of conditions attached to the operating permit of each nuclear facility also requires the licensee to analyse his own in-house experience and the ap-

plicability to his facility of events reported by the other Spanish plants, along with the main experiences reported by the international nuclear industry, mainly by equipment vendors and safety services. The results of these analyses are included in an annual report submitted for evaluation to the CSN.

16.1.2. Operating, maintenance, radiological surveillance, inspection and testing procedures

As established in the RINR, the documentation to be submitted when requesting an operating permit for a nuclear facility includes the operational environmental radiological surveillance programme, the operating regulation, the operating technical specifications and the quality assurance manual.

The licensee is required to submit a series of reports and documents for the regulatory control of his activities, as established by the RINR and by the limits and conditions established in the annex to the operating permit. These reports are different for nuclear and radioactive facilities.

- ✓ For the first, the licensees are required to submit to the MITYC and the CSN, among others, a monthly report on their most significant activities and on the operation of their facility, and an annual report including the results of the environmental radiological surveillance programme and the personnel dosimetry controls.
- ✓ In the case of radioactive facilities, the licensee is required to present an annual report containing a summary of the operations log and the statistical results of the personnel dosimetry controls.
- ✓ In the case of radioactive facilities involved in the nuclear fuel cycle, this last report is quarterly and the licensees are also required to submit an annual report including the results of their environmental radiological surveillance programmes.

Furthermore, the CSN is empowered to perform all types of inspections at nuclear and radioactive facilities, in order to ensure compliance with the conditions set out in the authorisation and the official operating documents approved, this including the resident inspectors in the case of the nuclear power plants.

The CSN currently has two resident inspectors at each operating NPP, whose main mission is inspect and observe the operational activities performed at the plants and report to the CSN on such activities.

During 2003, the CSN performed 205 inspections at the operating plants, 15 at the Juzbado fuel assembly manufacturing facility and 25 at the CIEMAT installations (authorised as a single nuclear facility), along with 7 at the facilities shut down (4 nuclear facilities and 2 radioactive), 16 at the group of those in operation (20 radioactive facilities) and 2 on the activities performed within the framework of the integrated plan for the improvement of the CIEMAT installations (PIMIC).

16.1.3. Engineering and technical support services

As established in the RINR, the Operating Regulation, a document included in the request for the operating licence or its renewal, contains information on job posts imply-

ing nuclear responsibilities and on the organisation and functions of the personnel attached to the facility, and defines the basic initial and on-going training programmes. In addition, in 2000 the nuclear facilities were required to develop their own procedures to analyse organisational changes implying any reduction in human resources, this being extended in 2002 to include any type of change, and to inform of their minimum staffing and technical capacities.

The organisation of all the nuclear facilities is very similar, entailing an off-site back-up organisation that performs support functions and the operating personnel in charge of functions relating directly to activities at the plant. In many cases, the support organisation includes sections having responsibilities relating to the management of fuel and radioactive waste.

At the site, the operations manager or facility manager is responsible for the operation and maintenance of the installation within the conditions established in the operating permit, and has under his charge the organisational units necessary to perform the implicit activities, among them waste and effluents management and technical and engineering support for operations.

The framework of the periodic safety reviews associated with renewal of the operating permit for each NPP includes a programme for assessment and improvement of safety in relation to organisational and human factors. The NPP's have already published their programmes and the organisations of the licensees have been adapted for their development, although they cannot yet be considered to be fully effective. The objective of these programmes is to guarantee the adoption of suitable measures to evaluate the capacities and limitations of human actuation.

The CSN performs activities to verify that the processes used by the licensees to maintain the staffing levels, competence and motivation of in-house and contracted human resources guarantees the maintenance and improvement of the safety of the nuclear facilities at all times. These activities include the approval of complementary technical instructions, the establishment of conditions, the drawing up of proposals and the acceptance of commitments regarding the integrated safety management systems and the investment management systems to be implemented at the NPP's.

16.1.4. Waste characterisation and segregation

The management of LILW in Spain is based on the El Cabril facility. In accordance with the successive operating permits, ENRESA is authorised to dispose of conditioned wastes in the LILW platform cells as long as these meet the acceptance criteria established for definitive disposal. It is also authorised to carry out the necessary tests and checks on the LILW for their characterisation.

The contracts between ENRESA and the waste producers include the acceptance criteria to be fulfilled by the waste for its removal by ENRESA for management at the El Cabril installations. In other words, they establish the responsibilities of the producer, making a distinction between radioactive and nuclear facilities.

1. In the case of radioactive facilities, the minor producer must:
    a) Request removal of his waste on the basis of the existing agreement (type contract in force, approved by the Directorate General for Energy Policy and Mines),

b) Optimise waste volumes (segregation at the point of origin),

c) Estimate activity, and

d) Facilitate subsequent management by presenting the wastes in a form suitable for the treatment foreseen. These wastes will be conditioned at the El Cabril facility.

ENRESA supports these producers in their segregation task, organising educational and training courses and providing them with the packaging for each radioactive waste stream. Prior to removal, ENRESA carries out a specific check to verify compliance with the acceptance criteria.

A step previous to segregation is the characterisation of the wastes generated at the facility, such that the material to be considered radioactive waste is clearly identified.

2. In the case of the nuclear facilities, the operating and waste management procedures of each installation include segregation, conditioning and temporary storage activities, along with 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 acceptance documentation specific to each type of waste package and producer, with a description of the characteristics and activity of the package and its corresponding production processes. Compliance with the acceptance criteria will be specifically checked by ENRESA. For this purpose ENRESA has implemented a system of inspections, production controls and verification tests that guarantees that the waste packages admitted at the El Cabril facility comply with the acceptance criteria, in which respect it applies to the different type packages generated at the NPP's a methodology and quality criteria previously authorised by the regulatory authorities.

   In the case of packages produced following approval of the acceptance criteria for disposal at El Cabril, ENRESA implements a set 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 as regards mechanical resistance, the absence of free liquids, etc., checking the representativeness of these results with respect to those obtained previously by the producer, and compliance by both with the acceptance criteria in force, and determining the concentration of activity in the package. These tests are added to the production controls and subsequent technical verification tests performed at the laboratory of the El Cabril facility.

16.1.5. Notification of incidents

The RINR establishes that the licensees of both nuclear and radioactive facilities are obliged to report to the Directorate General for Energy Policy and Mines on any event that implies an alteration to the normal operation of their installations or that might affect nuclear safety or radiation protection.

Additionally, and in compliance with the RINR, the nuclear facilities have a Site Emergency Plan that sets out the measures foreseen by the licensee and the assignment of responsibilities for responding to accident conditions, the aim being to mitigate the consequences of such conditions, protect the personnel of the facility and immediately notify the competent organisations of occurrence, this including an initial assessment of the circumstances and the consequences of the situation.

Furthermore, the CSN has established Safety Guide GSG-01.06 "Reportable events at operating nuclear power plants", which distinguishes abnormal events (accident situation) from all others.

16.2. Radioactive waste management at El Cabril

16.2.1. Operating permit: limits and conditions. Operating experience

The El Cabril nuclear facility for the disposal of solid radioactive waste obtained its first provisional operating permit by Ministerial Order on October 9th 1992. The operating permit currently in force, approved by Ministerial Order on October 5th 2001, will continue to be valid until the volume available for disposal in the existing cells is depleted. It is provided that ENRESA shall carry out periodic safety reviews allowing the operating conditions to be updated if operating experience or new technological or regulatory conditions make this advisable, these reviews being performed with a frequency of 10 years. Likewise, reviews of the SA shall be performed due to updates and improvements in long-term safety assessment and design modifications.

The operating permit is granted in accordance with the updated mandatory documents contained in the RINR (Safety Analysis, Operating Specifications, etc.), to which are added the acceptance criteria for disposal units. The limits and conditions regarding nuclear safety and radiation protection establish that the facility shall be operated in accordance with the corresponding revision of these documents.

The SA should include all the information required for assessment of the facility from the point of view of nuclear safety and radiation protection, with a distinction made between the operating phase and the phases of control and unrestricted use, along with an analysis and assessment of the risks arising as a result of its operation under both normal operating and accident conditions, throughout the three phases of its lifetime.

The Operating Specifications describe the general operating conditions of the El Cabril disposal facility. These conditions include the limit values of certain parameters relating to the radiological capacity of the disposal facility, the characteristics of wastes acceptable at the facility and acceptable for incorporation in containers to form disposal units, the properties of these units and the conditions imposed upon effluent releases during the operating phase. Also indicated are the following:

- ✓ The actions to be taken in the event of non-compliance with any limit condition or value.
- ✓ The operating conditions and surveillance requirements (revisions, checks, calibrations, etc.) to which the systems, equipment and components of importance for safety and radiation protection are subjected.

Each of the individual treatment and conditioning activities is described in documents known as Operating Instructions (OPI), which set out all the activities included within the scope of the instruction, the initial conditions and those existing during system operation, the operating limits and requirements, responses to anomalies, alarms and actuation modes of each of the systems of the facility, both those relating to waste management and auxiliary systems.

These documents are periodically drawn up and revised to include the operating experience and the different modifications implemented in the different systems. These updates are performed jointly by the organisations responsible for design and operation.

Complementary to operations activities, the facility has a maintenance plan and an organisation responsible for its development. This plan is articulated through general procedures. All the work carried out within the framework of the plan is supported by an SGIM computer system that facilitates and orders the different tasks to be performed.

Equipment maintenance is classified in three different types: preventive, predictive and corrective, and divided into the three main maintenance specialities: mechanical, electrical and instrumentation and control.

On the basis of the data acquired from the operating and maintenance experience, the organisations involved in the design of the facility and in these activities hold periodic meetings at which improvement plans are drawn up. These activities 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 operating permit for the El Cabril disposal facility issued in October 2001 provides that the MITYC may require that appropriate corrective actions be adopted in the light of the operating experience of the facility, the results of other on-going assessments and analyses and the results of inspections and audits. In 2003 the CSN performed 18 inspections at El Cabril.

Furthermore, this authorisation establishes the obligation to submit reports to the CSN during the first quarter of each calendar years on the following, among other aspects: design modifications implemented or in the course of implementation, the results of the environmental radiological surveillance programme and of the personnel dosimetry controls and the measures taken to analyse the applicability of the new national nuclear safety and radiation protection requirements and of the standards generated in this area in countries having disposal facilities of similar design. In this last case, the tests and checks contributing to improving understanding of the long-term behaviour of radioactive waste are considered to be relevant.

The main activities involved in a design modification are as follows:

a) Definition of the modification requested and its justification and description.

b) Preliminary assessment of the possible solution to be implemented and its impact on the mandatory documents, for example, whether a safety assessment is required.

c) Preparation of the specifications, calculations, reports, etc. required for the definition and design of the modification, these making up the design change package (DCP) that allows the different structures, equipment or components required in the modification to be acquired.

d) The modification management process concludes with the documentation provided by the different suppliers and the as-built edition of the project documentation, along with the revision and updating of the documents of the facility.

The following may be singled out from among the design modifications undertaken during 2003 and 2004:

- ✓ Treatment and conditioning of wastes arising from incidents, consisting of the implementation of treatment and conditioning systems for the radioactive wastes generated as a result of the smelting of sources of Cs-137.
- ✓ Disposal Unit acceptance criteria, including generic acceptance criteria for the approval of new DU's or modification of the configuration of DU's already approved.
- ✓ Construction at the El Cabril disposal facility of a new auxiliary conditioning building for waste treatment and conditioning, waste decontamination processes, characterisation processes, acceptance and verification of waste and temporary waste storage. This building is located inside the controlled zone adjacent to the existing conditioning building, with which it shares the same criteria.
- ✓ Provisional use of the disposal cells for temporary storage. As a result of the incidents involving the smelting of radioactive sources at a number of steelyards, the need arose for an additional temporary storage capacity. Following the evaluation of different alternatives, the option considered to be the best was the provisional use of capacities authorised for the definitive disposal of LILW, these being provided with the necessary handling and protection resources.

16.2.3. Engineering and technical support services

As established in the RINR, the Operating Regulation contains information on job posts entailing nuclear responsibility and on the organisation and functions of the personnel attached to the facility, and defines the basic initial and on-going training programmes.

In the specific case of the El Cabril facility, and as is reflected in the organisational flowchart included in Annex F of this report, the operations organisation is based on different organisational units that report to the Management of the Facility, the Director reporting in turn to the ENRESA Director for Technical Division. General technical support is provided to the facility from ENRESA headquarters, via the Safety and LILW Engineering Departments. Furthermore, Project Engineering, contracted by the LILW Engineering Department, is generally responsible for the performance and revision of both the design and the technical validity of modifications, in accordance with the requirements established by the ENRESA Project Manager.

The operation of the facility is the responsibility of the supervisors and operators holding licenses issued by the CSN, and is regulated via a series of administrative procedures that establish the functions and responsibilities of each of the services into which the activities of the facility are divided, along with their relationships and communications. In addition, there is a medical service authorised to undertake the monitoring of personnel professionally exposed to ionising radiations.

An annual training programme is drawn up on the basis of the functions assigned to each job post, with collaboration by the Service heads. The objective of this training is to ensure the maintenance of basic knowledge in areas affecting radiation protection, emergencies and fire-fighting.

16.2.4. Waste characterisation and segregation

The first operating permit for El Cabril, issued in October 1992, established that the criteria applied for the acceptance of wastes at the facility should be approved by the regulatory authorities, due to their constituting an official operating document. These criteria were in force up to December 2004, with minor modifications introduced throughout this period, and were applied to primary waste packages.

In December 2001, and on completion of a characterisation campaign on container CE-2a, in accordance with the requirements of the French Fundamental Safety Rule RFS-III.2, ENRESA requested CSN authorisation for a modification with certain revised acceptance criteria. It was proposed that the criteria be applicable 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 a specification guaranteeing their quality and agreed on between ENRESA and the producers.

The regulatory authorities finally approved this modification in December 2004, thus allowing the characteristics of the 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 of the activity limit per primary waste package
- ✓ Increase of the acceptable dose rate limit per primary waste package
- ✓ Optimisation of certain lines of conditioning in packages with walls

ENRESA currently has 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.

Waste management at the El Cabril facility is designed to allow for the identification, tracking and control of all the waste packages at the installation and for updating of the inventory of activity stored in the cells, such that this may be contrasted at all times with the maximum radiological capacity (reference inventory).

ENRESA is authorised to perform the necessary tests and checks on the LILW destined for characterisation and acceptance. The controls applied to the acceptance process are mainly process audits, production controls and destructive and non-destructive technical verification tests, mainly performed at the El Cabril laboratory. The objectives of these tests are as follows:

- ✓ Checking of activity values against those declared by the producer and tracking of scaling factors in the case of difficult to measure radionuclides.
- ✓ Compliance with waste package properties associated with the generation methodology.
- ✓ Checking of chemical aspects of importance for the safety of disposal (compatibility with the container, corrosion, etc.).
- ✓ Compliance with the quality objectives of the conditioned wastes.

16.2.5. Notification of incidents

The El Cabril facility has its regulatory Site Emergency Plan. Emergency situations are classified in three categories, none of which contemplates the release of radioactive material in quantities such that it would be necessary to adopt protective measures off site. Consequently, no Emergency with a level of severity higher than that of the Site Emergency is defined.

In addition to the organisation for normal conditions, the Site Emergency Plan includes the activities and the organisation for operation of the facility in emergency situations requiring interventions other than the normal activities performed on site. The emergency organisation is based on the operating organisation itself, although mechanisms have also 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 foreseen in all cases.

16.3. Assessment of compliance

On the basis of what has been set out in the previous sections, it may be concluded that the Spanish legislation reasonably ensures the adoption of measures by the licensees of the radioactive waste management facilities existing in Spain to comply with the conditions of article 16 of the Convention.

The Spanish regulations require that the licensee draw up and submit a series of documents with requests for operating permits for nuclear facilities containing a complete safety assessment, as well as the performance of a programme of pre-nuclear tests, carried out under the supervision of the CSN and the MITYC. Furthermore, an annex to the permit includes the limits and conditions on nuclear safety and radiation protection established by the CSN and to be fulfilled by the licensee during the operating period.

As provided in the Spanish regulations, in order to obtain the operating permit the licensee of the nuclear facility is required to submit a study on forecasts for dismantling and decommissioning. It is likewise established that the licensee shall be obliged to assess the applicability of new technologies or new national requirements, as well as of the nuclear safety and radiation protection standards generated in countries having facilities of a similar design.

Article 17
Institutional measures after closure

Art. 17. Institutional measures after closure.

Each Contracting Party shall take the appropriate steps to ensure that after closure of a disposal facility:

i) records of the location, design and inventory of that facility required by the regulatory body are preserved;

ii) active or passive institutional controls such as monitoring or access restrictions are carried out, if required; and

iii) if, during any period of active institutional control, an unplanned release of radioactive materials into the environment is detected, intervention measures are implemented, if necessary.

17.1. Custody of documents

In accordance with the Royal Decree by which ENRESA was created[33], this public company is responsible for permanently maintaining an archive reflecting the inventory of wastes deposited at radioactive waste storage or disposal facilities. Such custody is the responsibility of ENRESA even following the decommissioning or closure of such facilities.

17.2. Period of compliance following decommissioning or closure

The RINR is the regulatory framework of reference for the dismantling and decommissioning of nuclear and radioactive facilities. From the point of view of regulation and control, it places first category radioactive facilities involved in the nuclear fuel cycle at the same level as nuclear facilities (art. 37 of the RINR).

In Spain all facilities, decommissioned or in the phase of dismantling for decommissioning, at which conditioned wastes are kept in storage or disposal belong to the front end of the nuclear fuel cycle (mining tailings and tailings from the processes of disused uranium concentrates facilities), with the exception of Vandellós I NPP. Some of these facilities (stores or deposits) are currently in the so-called compliance period, pending the declaration of decommissioning. Another is in the dismantling phase and, finally, one has obtained the aforementioned decommissioning declaration – for more information, refer to Section D of this report (Inventories and lists).

The aforementioned regulation establishes that the process of dismantling these facilities should finish with a declaration of decommissioning freeing the licensees from their responsibilities as operators (art. 12 f of the RINR).

The period of compliance is a period prior to the decommissioning declaration aimed at verifying in the short term the suitability of the waste conditioning operations carried

[33] *RD 1522/1984, now annulled by RD 1349/2003, of October 31st, on the Ordering of ENRESA Activities.*

out and of the different engineered barriers implemented. During this period the facility continues to be under the responsibility of the licensee and subject to habitual regulatory control.

17.3. Institutional controls and forecasts for the future

The institutional controls that will foreseeably be imposed in order to restrict use of the site following the decommissioning of facilities with radioactive waste stored or disposed of should be contemplated in the declaration of decommissioning granted, in accordance with the specifications of the RINR (art. 12 f of the RINR).

The statement of closure should include a definition of the limitations on use applicable at the site, along with identification of the entity or organisation responsible for maintaining such limitations and watching over compliance with them (art. 12 f of the RINR).

Section g) of article 2 of the Royal Decree by which ENRESA was created establishes as one of its functions the guaranteed long-term management of all facilities serving to house waste.

Article 2 of Law 15/1980 creating the CSN, in the wording established in the first additional provision of Law 14/99, in section g), attributes to this organisation the function of control and surveillance of the radiological quality of the environment throughout the national territory, in compliance with the international obligations of Spain in this respect, and without prejudice to the competences attributed to the different public administrations.

Article 25, "Fund for financing of activities contemplated in the general radioactive waste plan", of the recent Royal Decree 5/2005 on Urgent Reforms to Promote Productivity and Improve Public Contracting, modifies the Electricity Industry Act, Law 54/1997, establishing that the State shall assume the ownership of radioactive wastes once their definitive disposal has been addressed. The State shall also undertake whatever surveillance might be required following the decommissioning of a nuclear or radioactive facility, once the period of time established in the corresponding statement of closure has elapsed.

The institutional controls required in future statement of closure have not yet been defined from the point of view of the organisations responsible for long-term control. It is foreseeable that shared responsibilities might be assigned to fulfil the different institutional control objectives imposed (security, documentary records deposit, etc.). To date, the only decommissioned facility at which waste materials are stored is the Lobo-G Plant, the statement of closure of which defines the licensee as the party responsible for institutional surveillance.

In the case of the decommissioned fuel cycle facilities not having any radiological restrictions on use, and logically not having stored or deposited radioactive wastes, the only institutional requirement established in their declarations of decommissioning is maintenance by the licensee of 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.

This is the case of the Argonaut type experimental reactors Argos, in Barcelona, and Arbi, in Bilbao, decommissioned in 2003 and 2005, respectively.

17.4. Forecasts regarding possible remedial interventions

The possible remedial interventions at decommissioned facilities housing stored or deposited radioactive wastes should be foreseen in the declarations of decommissioning issued. For the reasons explained above, it would appear to be foreseeable that the practical implementation of such remedial measures or actions would be assigned in the said declarations to the entities or organisations assigned the responsibility for long-term control.

17.5. Assessment of compliance

To date only one facility has been decommissioned and continues to house stored or deposited radioactive waste. Measures have been taken to ensure compliance with the requirements of article 17 at this facility. Likewise, those facilities that are currently in the same circumstances and whose decommissioning is foreseen in the relatively near future are also expected to meet the requirements of the aforementioned article.

Section I

Transboundary movement

Article 27
Transboundary movement

Article 27. Transboundary movement

1. *Each Contracting Party involved in transboundary movement shall take the appropriate steps to ensure that such movement is undertaken in a manner consistent with the provisions of this Convention and relevant binding international instruments. In so doing:*

   i) *a Contracting Party which is a State of origin shall take the appropriate steps to ensure that transboundary movement is authorized and takes place only with the prior notification and consent of the State of destination;*

   ii) *transboundary movement through States of transit shall be subject to those international obligations which are relevant to the particular modes of transport utilized;*

   iii) *a Contracting Party which is a State of destination shall consent to a transboundary movement only if it has the administrative and technical capacity, as well as the regulatory structure, needed to manage the spent fuel or the radioactive waste in a manner consistent with this Convention;*

   iv) *a Contracting Party which is a State of origin shall authorize a transboundary movement only if it can satisfy itself in accordance with the consent of the State of destination that the requirements of subparagraph (iii) are met prior to transboundary movement;*

   v) *a Contracting Party which is a State of origin shall take the appropriate steps to permit re-entry into its territory, if a transboundary movement is not or cannot be completed in conformity with this Article, unless an alternative safe arrangement can be made.*

2. *A Contracting Party shall not licence the shipment of its spent fuel or radioactive waste to a destination south of latitude 60 degrees South for storage or disposal.*

3. *Nothing in this Convention prejudices or affects:*

   i) *the exercise, by ships and aircraft of all States, of maritime, river and air navigation rights and freedoms, as provided for in international law;*

   ii) *rights of a Contracting Party to which radioactive waste is exported for processing to return, or provide for the return of, the radioactive waste and other products after treatment to the State of origin;*

   iii) *the right of a Contracting Party to export its spent fuel for reprocessing;*

   iv) *rights of a Contracting Party to which spent fuel is exported for reprocessing to return, or provide for the return of, radioactive waste and other products resulting from reprocessing operations to the State of origin.*

27.1. Legislative development

The European Commission is currently drawing up a draft Directive relating to the surveillance and control of radioactive waste and spent fuel transfers, which will presumably replace 92/3/EURATOM, improving and simplifying it and extending its scope.

The process of revising Directive 92/3/EURATOM began in the context of the SLIM Initiative for simplification of the European Union legislation.

The proposal also takes into account the following:

- ✓ Coherence with the latest European Directives.
- ✓ Conformity with international agreements, particularly significant among which is the Joint Convention.

The following may be underlined among the aspects introduced in the draft Directive, with respect to 92/3/EURATOM:

- ✓ Inclusion within the scope of spent fuel.
- ✓ Modification of the transfer acceptance procedure, including among other things the non-optional introduction of the concept of positive silence for such acceptance.
- ✓ Obligatory prior consent by the country of destination in Community exports.

27.2. Spanish experience

The Spanish experience of transboundary movements during the period considered has consisted only of low and intermediate level radioactive waste transfers in which Spain has been the country of destination. Specifically, the following wastes have been received:

- ✓ Radioactive wastes from the decontamination of reactor coolant pumps at Spanish nuclear power plants.
- ✓ Radioactive wastes from the treatment of liquid wastes from disused Spanish nuclear facilities.
- ✓ Radioactive wastes from incineration for volume reduction.

27.3. Assessment of compliance

As regards transboundary movements of radioactive waste, both the Spanish standards covering international transfers and transport and the practices implemented meet the requirements of this article.

In relation to transboundary movements of spent fuel, an activity that has not been performed in Spain in recent years, the standards covering the transport of hazardous goods and the mandatory authorisation for the transport of spent fuel contemplated in the Spanish cask model allow for performance of the requirements imposed in the article. Furthermore, the European draft Directive, which following its foreseeable approval will be transposed into the Spanish law, will include more detailed procedures on the surveillance and control of spent fuel transfers.

Section J

Disused sealed sources

Article 28
Disused seales sources

Art. 28: Disused sealed sources

1. *Each Contracting Party shall, in the framework of its national law, take the appropriate steps to ensure that the possession, remanufacturing or disposal of disused sealed sources takes place in a safe manner.*
2. *A Contracting Party shall allow for re-entry into its territory of disused sealed sources if, in the framework of its national law, it has accepted that they be returned to a manufacturer qualified to receive and possess the disused sealed sources.*

28.1. Measures to ensure that the possession, remanufacturing or disposal takes place in a safe manner

Article 31 of the LEN 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 enacted in the RINR. The articles of this regulation establish the licensing system to be adhered to by the radioactive facilities, indicating the characteristics to be fulfilled for consideration as such, as has been indicated in Section E. They likewise establish a system for approval by the MITYC of types of radioactive apparatus, following a report by the CSN in which the conditions for their removal will be established.

These requirements are applicable regardless of whether the radioactive sources or materials are new, spent or out of use.

Consequently, in Spain the possession or remanufacturing of any source of radioactive material requires administrative authorisation. During the licensing process that the licensee has to adhere to in order to obtain such authorisation, it is necessary for the CSN to issue a report on safety and radiation protection, after having verified that the licensee will perform all the operations in compliance with the applicable safety and radiation protection standards and requirements. The corresponding authorisations issued

by the competent bodies are accompanied by the applicable limits and conditions regarding safety and radiation protection.

Among the documentation to be submitted by the licensees in order to obtain these authorisations is a document on arrangements for the decommissioning of the facility, in which the licensee is required to provide information on arrangements for the safe management of disused sources, including the economic coverage foreseen for this.

Whenever, in application of its functions of inspection and control of authorised facilities, the Spanish regulatory body encounters situations in which radioactive sources or equipment are no longer in use, it encourages the licensees to arrange for their removal following the routes contemplated in the regulations and supervises the performance of these activities.

As regards the disposal of disused radioactive sources, different provisions are adopted in Spain depending on the different situations that might arise.

In the case of radioactive sources for which the licensee has obtained authorisation as a radioactive facility, allowing him to possess and use such sources in accordance with the safety and radiation protection limits and conditions accompanying the said authorisation, the licensee is obliged to return such disused radioactive sources to the supplier or arrange for their management through ENRESA.

In Spain there are no facilities for the manufacturing or production of sealed radioactive sources; in other words, all the sources are imported from other countries. The importing of radioactive sources is also subject to a system of authorisation, in accordance with the provisions of article 74 of the RINR, except in the case of sources coming from European Union member States. In this case, the system applied contemplates the reporting of transfer of the sources to the authorities of the receiving country and acceptance by the latter, as established in Regulation 1493/1993/EURATOM.

When the entity that is to import the radioactive sources is authorised as a radioactive facility, such authorisation also empowers it to import radioactive sources (single authorisation). The limits and conditions accompanying such authorisations establish the obligation that all entities importing radioactive sources from other countries establish agreements with the overseas suppliers for the return of the 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 such sources to the supplier at the end of their service lifetime (for example, due to the supplier having disappeared). In such cases, the limits and conditions of the authorisations establish that the licensee should contact ENRESA for the latter to remove and manage the source as a radioactive waste. In this case, ENRESA, on the basis of the standards regulating its activities, is responsible for managing the radioactive sources and providing a final destination for them in accordance with the applicable regulations, disposing of them at the authorised LILW disposal facility that it has at El Cabril or adopting appropriate measures for their final management.

In the case of disused radioactive sources outside the regulatory control system (old or orphan sources), that is to say, when there is no licensee authorised to posses such sources, the two possibilities mentioned above are also contemplated. If it is possible to identify the supplier of the source, the person having 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 RINR, the removal by ENRESA of non-authorised disused sources requires a specific authorisation for transfer issued by the MITYC, following a report from the CSN.

A special case in relation to orphan sources is their detection at facilities for the processing or recovery of metallic scrap. The activities to be performed for the safe management of such sources are contemplated in a Protocol subscribed between the companies involved in the sector, the former 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 is obliged to set up technical and administrative systems for isolation of the source, identification of the radioactive isotope and its activity and maintenance of a safe situation until the source is removed. This protocol also establishes that when the radioactive source is of national origin, it shall be managed as a radioactive waste by ENRESA, which shall assume the corresponding costs. In other cases, the sources shall be returned to the supplier of the scrap and, if this were not to be feasible, shall be transferred to ENRESA for management as radioactive waste, in which case the costs derived shall be to the companies, without prejudice to the possibility of their applying such costs to the supplier or dispatcher of the scrap.

Another special case is that of the batches of Ra-226 needles for medical use that were used in Spain prior to development of the standards regulating authorisations for the possession and use of radioactive sources and materials. These sources have not been used for many years now, and they have been the subject of specific campaigns for their recovery, removal and management by ENRESA. The costs of this management have been covered by the ENRESA fund, without any cost to the owners. Very few batches of Ra-226 needles continue to appear at present, and when they do they are managed as indicated above.

The possession, use, transfer and disposal of radioactive sources under safe conditions are guaranteed in all the cases mentioned in the previous paragraphs, since the different entities participating in these processes are obliged to meet the requirements of the Regulation on Protection against Ionising Radiations. This Spanish standard includes safety and radiation protection requirements equivalent to those of the International Standards on Radiation Protection and on the Safety of Radiation Sources of the Internal Atomic Energy Agency (IAEA) and European Union Directive 96/29/EURATOM.

In December 2003, the Council of the European Union approved Directive 122/2003/EURATOM on the Control of High Activity Sealed Radioactive Sources and Orphan Sources. At present there is a project under way in Spain to incorporate the requirements of this Directive into the national regulations, which is expected to be approved before the end of 2005.

This new provision includes requirements relating to the creation and maintenance of a register of high activity sealed sources, the obligation of the possessors to return disused sources to the suppliers, the identification and marking of sources, personnel training and surveillance measures to detect the appearance of orphan sources and address their subsequent management, including the establishment of financial guarantees to cover the costs derived therefrom.

28.2. Re-entry into the Spanish territory of disused sealed sources

As has been mentioned above, there are currently 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 re-entry of radioactive sources exported by Spanish manufacturers.

The authorisation for Spanish licensees to import sealed radioactive sources from other countries requires that the said licensees meet the requirements of this article, accepting the return of disused sources to suppliers or manufacturers authorised in their respective national territories.

28.3. Assessment of compliance

In accordance with what has been said in the previous sections, the legal and regulatory provisions in Spain ensure adequate control of sealed sources, both in use during their service lifetime at the radioactive facilities and in disposal when they are no longer in use.

Likewise, although radioactive sources are not currently manufactured or produced in Spain, the legal and regulatory provisions do not prevent the re-entry of whatever radioactive sources might be exported by Spanish manufacturers.

Section K

Activities planned to improve safety

This Second National Report has set out the situation existing in Spain in relation to the management of spent fuel and radioactive waste in the context of the safety requirements established in the Joint Convention. In the light of the information provided in dealing with each article and assessing its compliance, it may generally be stated that the Spanish system continues to meet the requirements of the Convention.

Nevertheless, taking into account the very nature of the safe management of radioactive waste and spent fuel, in particular in the long term, work continues on improving the legal and regulatory framework, and also other areas relating to the different aspects of spent fuel and radioactive waste management.

Outlined below are the areas in which work is being performed and in which improvements are expected to be achieved in the short and medium term.

K.1. Legislative developments in relation to the safety of spent fuel and radioactive waste management

As has been explained in Section E, article 18 of this Second National Report, and initially introduced in Section K, sub-sections K.1 and K.2, of the First National Report, the working group set up in 2001 by the CSN and the MITYC, in collaboration with ENRESA, continues to work on the identification of shortcomings and the formulation of proposals regarding the specific concepts and aspects identified, as well as on determination of most adequate supporting legal instruments. In this respect, it may be pointed out that Royal Decree Law 5/2005, of March 11th, defines the framework for the assignment of ownership of waste and responsibilities for the phase following decommissioning of the facilities, an area in which there were shortcomings in the legal framework identified in the First Report.

As has been repeatedly established throughout this report, the aspects in which work will continue in order to complete the legal and regulatory framework and define the policy for the long-term management of spent fuel and radioactive waste are as follows:

- ✓ Process of designating candidate sites for spent fuel and HLW disposal facilities (Section H, sub-section 13.5)

- ✓ Specific regulatory framework regulating long-term radiological risk, and the safety principles and criteria applicable to disposal facilities for SF and/or radioactive waste (Section H, sub-section 11.6)
- ✓ Reports on management options contemplating the different alternatives considered at international level for SF and HLW, in order to be able to undertake the necessary initiatives supporting the decision-making process (Section G, sub-section 4.8)

K.2. Implementation of radioactive waste management plans at production facilities

The first national report on the Joint Convention indicated that the CSN was promoting new developments for the mandatory RWMP document, such that it contribute to an overall reflection on the management of all radioactive wastes. With a view to analysing the most appropriate content and scope of such documents, a working group was set up in 2001, including representatives of the CSN, UNESA, ENRESA and ENUSA.

The objective of this document is to improve the management of the wastes produced at each facility. In particular, the licensee of the facility is required to keep updated the inventory of his waste, minimise its production, recycle and attach value to the waste produced to the extent to which this is technically and economically possible and condition the final waste materials for their removal, serving also to guarantee that no radioactive wastes are disposed of along a conventional route.

According to current plans, the process of drawing up the new RWMP's will have been completed at all the Spanish nuclear facilities by the end of 2005.

A period of analysis of experience relating to the main novelty aspects included in the RWMP's is expected to begin during 2006. Particularly significant among these aspects are the classification of the facilities into radioactive waste production zones and conventional waste zones and the implementation of a second line of defence for the radiological control of all materials exiting the facilities.

K.3. Construction of a centralised temporary storage (cts) facility

The construction of a centralised temporary storage facility to house the spent fuel from the nuclear power plants, the long-lived radioactive waste that cannot be sent to the El Cabril LILW disposal facility and waste from reprocessing returned from abroad is one of the fundamental objectives of the national strategy for the management of these materials. In this respect it should be pointed out that in December 2004, the Spanish Parliament urged the MITYC to propose a revision of the PGRR to the Government, with a view to updating the strategies defined therein, and in particular those referring to the CTS facility.

For the purposes of establishing the decision-making process for the designation of the CTS facility, consideration will be given to the experience provided by the EU's Sixth Framework Programme COWAM project and its adaptation to the Spanish framework.

Sección L

Annexes

Annex A

Internal legal standards in the area of nuclear energy and radioactive waste

1. Standards of legal standing

1. Nuclear Energy Act (Span. *Ley de Energía Nuclear*, LEN; Law 25/1964 of April 29th; BOE 04.05.1964). This law has recently been modified by Law 62/2003, of December 31st, on fiscal, administrative and social measures.
2. Law Creating the Nuclear Safety Council (Span. *Consejo de Seguridad Nuclear*, CSN; Law 15/1980, of April 22nd; BOE 25.04.1980). This law has also recently been modified by Law 62/2003, of December 31st, on fiscal, administrative and social measures.
3. Law on Public Fees and Prices for services rendered by the Nuclear Safety Council (Law14/1999, of May 4th; BOE 05.05.1999)
4. Electricity Industry Act (Law 54/1997, of November 27th; BOE 28.11.1997 and 31.12.2001).
5. Law on Right to Access to Environmental Information (Law 38/1995, of December 12th; BOE 13.12.1995).
6. Royal Legislative Decree on the Environmental Impact Assessment (Approved by RDL 1302/1986, of June 29th), modified by Law 6/2001, of May 8th (BOE 09.5.2001)

2. Standards of regulatory standing

1. Royal Decree 1546/2004, of June 25th, approving the basic Nuclear Emergency Plan. (PLABEN; BOE 14.07.2004)
2. Royal Decree 208/2005, of February 25th, on Electrical and Electronic Apparatus and Waste Management (BOE 26.02.2005) and contemplating the obligatory and cost free removal of such waste, including radioactive sources.
3. Regulation on Nuclear and Radioactive Facilities. (Span. *Reglamento de Instalaciones Nucleares y Radiactivas, RINR*; Approved by Royal Decree 1836/1999, of December 3rd; BOE 31.12.1999)
4. Regulation on Protection against Ionising Radiations. (Span. Reglamento de Protección Sanitaria contra Radiaciones Ionizantes, RPSRI; Approved by Royal Decree 783/2001, of July 6th; BOE 26.06.2001).

5. Regulation on the Coverage of Nuclear Risk. (Decree 2177/1967, of July 22nd; BOE 18.09.1967).
6. Royal Decree 2967/1979, of December 7th, on the Ordering of Activities within the Nuclear Fuel Cycle (BOE 14.01.1980, modified by Royal Decree 1899/1984, of August 1st, BOE 27.10.1984).
7. Regulation on the Environmental Impact Assessment (Approved by Royal Decree 1131/1988, of September 30th, BOE 05.10.1998; also RD 9/2000 of October 6th, BOE 07.10.2000).
8. Royal Decree on the Radiation Protection of off-site workers with the risk of exposure to ionising radiations due to their intervention in the controlled zone (Royal Decree 413/1997, of March 21st; BOE 16.04.1997).
9. Royal Decree on the Physical Protection of Nuclear Materials (Royal Decree 158/1995, of February 3rd; BOE 4.03.1995).
10. Royal Decree on Radioactive Lightning Rods (Royal Decree 1428/1986, of June 13th, BOE 11.07.1986, modified by RD 903/1987, of July 10th, BOE 11.07.1987)
11. Royal Decree on the Supervision and Control of shipments of radioactive waste between member States and into and out the Community (Royal Decree 2088/1994, of October 20th, BOE 26.11.1994)

3. Technical instructions

The CSN technical instructions are binding provisions dictated by the CSN by virtue of the legal powers bestowed directly upon it and aimed at a group or an indeterminate number of individuals, such instructions having as their objective technical issues relating to the exercising of their respective areas of competence regarding nuclear safety and radiation protection. The legal basis for such instructions is to be found in art. 2.a) of Law 15/1980, in accordance with the wording given by Law 14/1999, of May 4th.

This concept covers the following:

1. The technical standards that the CSN may dictate on its own initiative, this implying an increase in the legislative capacities of the Organisation by legal determination;
2. The previously existing possibility of drawing up general technical standards in enactment of Government Regulations.

As regards the nature of these technical standards, they are true regulations, integrated permanently in the legal system, and may be subject to judicial review like any general standard. Non-compliance with these standards is legally typified as an administrative infringement.

The total number of technical instructions is six: one refers to acquisition of the radiological work permit, another to the nuclear power plants and the remaining four to various aspects of radiation protection.

1. CSN INSTRUCTION IS-01, (BOE 6.08.01) defining the format and content of the individual radiological monitoring document, of the radiological passbook regulated in Royal Decree 413/1997 (BOE, August 6th 2001).
2. CSN INSTRUCTION IS-02, revision 1, of July 21st 2004 (BOE 16.09.2004); correction of errors in BOE 11-10-2004), regulating the documentation on refuelling activities at Light Water Reactor Nuclear Power Plants.
3. CSN INSTRUCTION IS-03, of November 6th 2002 (BOE 12.12.02) on the qualifications required to obtain recognition as an expert in protection against ionising radiations
4. CSN INSTRUCTION IS-04, of February 5th 2003 (BOE 28.02.03), regulating transfers, filing and custody of documents corresponding to the radiation protection of the workers, public and environment prior to the transfer of ownership of nuclear power plant practices performed with a view to their dismantling and decommissioning.
5. CSN INSTRUCTION IS-05, of February 26th 2003 (BOE 10.04.03), defining the values of exemption for nuclides, as established in tables A and B of annex I of Royal Decree 1836/1999.
6. CSN INSTRUCTION IS-06, of April 9th 2003 (BOE 03.06.03), defining training programmes on basic and specific radiation protection regulated in Royal Decree 413/1997, of March 21st, in the area of nuclear and radioactive fuel cycle facilities.

4. Safety guides

The Safety Guides are not binding. They contain methods recommended by the CSN from the point of view of nuclear safety and radiation protection and their objective is to orient the users and facilitate for them the application of the Spanish nuclear regulations in force. Compliance with these guides is not obligatory and the user may apply methods and solutions different from those contained therein, as long as they are duly justified. Comments and suggestions that may serve to improve the contents of these guides will be considered in later revisions.

✓ The guides approved to date may be classified as follows:

✓ Power reactors and nuclear power plants: guides GSG- 1.1 to GSG - 1.15.

✓ Radiological environmental monitoring: GSG -4.1

✓ Radioactive facilities and apparatus: GSG -5.1 to GSG -5.16

✓ Transport of radioactive materials: GSG - 6.1

✓ Radiation protection: GSG - 7.1 to GSG -7.7

✓ Physical protection: GSG - 8.1

✓ Waste management: GSG - 9.1 to GSG -9.2

✓ Miscellaneous

The following list reflects the content of and recent modifications to these guides:

1. GS-1.1 Qualifications for the acquisition and use of nuclear power plant operating personnel licences. March 1986. This Safety Guide is currently undergoing technical and administrative revision with a view to adapting it to the legislation currently in force.
2. GS-1.2 Nuclear emergency dosimetry model. October-1990. The content of this guide has recently been modified.
3. GS-1.3 Nuclear power plant emergency plan. May-1987. This Safety Guide is currently undergoing technical and administrative revision with a view to adapting it to the legislation currently in force.
4. GS-1.4 Radiological control and surveillance of liquid and gaseous radioactive effluents released by nuclear power plants. December-1988. This Safety Guide is currently undergoing technical and administrative revision with a view to adapting it to the legislation currently in force.
5. GS-1.5 Documentation on refuelling activities at light water reactor nuclear power plants. December-1990. This has been cancelled but, as a result of the revision of IS-2, will reappear as a Safety Guide.
6. GS-1.6 Reportable events at operating nuclear power plants. January -1990. This Safety Guide is currently undergoing technical and administrative revision with a view to adapting it to the legislation currently in force.
7. GS-1.7 Information on nuclear power plants operation to be submitted to the CSN by the licensees. November-1996. This was revised and updated by the CSN in November 2003.
8. GS-1.9 Emergency drills and exercises at nuclear power plants. January -1996. This Safety Guide is currently undergoing technical and administrative revision with a view to adapting it to the legislation currently in force.
9. GS-1.10 Periodic safety reviews at nuclear power plants. December-1995. This Safety Guide is currently undergoing technical and administrative revision with a view to adapting it to the legislation currently in force.
10. GS-1.11 Design modifications at nuclear power plants. July-2002.
11. GS-1.12 Practical application of the optimisation of radiation protection in the nuclear power plant operation. February -1999.
12. GS-1.13 Contents of nuclear power plant operating regulations. March-2000. The content of this safety guide has recently been modified.
13. GS-1.14 Criteria for the performance of Probabilistic Safety Assessment applications. January -2001. The content of this safety guide has recently been modified.
14. GS-1.15 PSA Updating and maintenance. 2004. Approved by the CSN on 17-03-04.
15. GS-4.1 Design and development of the Environmental Radiological Surveillance programme for nuclear power plants. June -1993.
16. GS-5.1 Technical documentation for request for construction and start-up permits for facilities handling and storing non-encapsulated radioactive isotopes

(2nd and 3rd category). June -1986. This Safety Guide is currently undergoing technical and administrative revision with a view to adapting it to the legislation currently in force.

17. GS-5.2 Technical documentation for request for construction and start-up permits for facilities handling and storing encapsulated sources (2nd and 3rd category). October -1986. This Safety Guide is currently undergoing technical and administrative revision with a view to adapting it to the legislation currently in force.
18. GS-5.3 Control of the hermetic sealing of capsulated radioactive sources. June -1987. This Safety Guide is currently undergoing technical and administrative revision with a view to adapting it to the legislation currently in force.
19. GS-5.5 Technical documentation for requests for construction and start-up permits for radiotherapy facilities. June -1988. This Safety Guide is currently undergoing technical and administrative revision with a view to adapting it to the legislation currently in force.
20. GS-5.6 Qualifications for the acquisition and use of radioactive facility operating personnel licences. June -1988. This Safety Guide is currently undergoing technical and administrative revision with a view to adapting it to the legislation currently in force.
21. GS-5.7 Technical documentation for requests for construction and start-up permits for X-ray facilities for radiodiagnosis. This guide has been cancelled, the authorisation having been replaced with arrangements for a declaration, as contained in R.D. 1891/1991. January-1988.
22. GS-5.8 Basis for the preparation of information relating to the operation of radioactive facilities. November -1988. This Safety Guide is currently undergoing technical and administrative revision with a view to adapting it to the legislation currently in force.
23. GS-5.9 Documentation for requests for the authorisation and entry of X-ray equipment sales and technical assistance companies. March -1998.
24. GS.5.10 Technical documentation for requests for authorisation for X-ray facilities for industrial purposes. October -1988. Rev 1.
25. GS-5.11 Technical aspects of safety and radiation protection at X-ray facilities for medical diagnosis. October-1990. This Safety Guide is currently undergoing technical and administrative revision with a view to adapting it to the legislation currently in force.
26. GS-5.12 Homologation of training courses for the supervisors and operators of radioactives facilities. March -1998.
27. GS-5.13 Homologation of training courses for personnel directing or operating X-ray diagnostic facilities. Text approved by the CSN in 1998.
28. GS-5.14 Safety and radiation protection at industrial gammagraphy radioactive facilities. October-1999. This Safety Guide is currently undergoing technical and administrative revision with a view to adapting it to the legislation currently in force.

29. GS-5.15 Technical documentation for the request of type approval for radioactive apparatus. November-2001. This Safety Guide is currently undergoing technical and administrative revision with a view to adapting it to the legislation currently in force.

30. GS-5.16 Technical documentation for the request of operating permits for radioactive facilities containing industrial process control equipment January -2001. The content of this safety guide has recently been modified.

31. GS-6.1 Quality assurance in the transport of radioactive substances. July-2002.

32. GS-6.2 Radiation protection programme applicable to the transport of radioactive materials. 2003.

33. GS-6.3 Instructions on emergencies in the transport of radioactive substances. 2004.

34. GS-7.1 Technical-administrative requirements for Individual Personal Dosimetry Services. November -1985. This Safety Guide is currently undergoing technical and administrative revision with a view to adapting it to the legislation currently in force.

35. GS-7.2 Qualifications for recognition as an expert in protection against ionising radiations, for the undertaking of responsibility for the corresponding Service or Technical Unit. October -1986.Cancelled and replaced by IS-03 (BOE 12-12-02).

36. GS-7.3 Basis for the establishment of Services or Technical Units for Protection against Ionising Radiations. Rev.1 June-1998. The content of this safety guide has recently been modified.

37. GS-7.4 Basis for the medical surveillance of workers exposed to ionising radiations. Rev.2 June-1998. Cancelled on approval of the Protocol of the Ministry of Health for the medical surveillance of exposed workers.

38. GS-7.5 Actions to be implemented in the case of persons affected by radiological accidents. 26-05-2005. Revision 1.

39. GS-7.6 Contents of radiation protection manuals for nuclear facilities and radioactive facilities pertaining to the nuclear fuel cycle. September-1992. This Safety Guide is currently undergoing technical and administrative revision with a view to adapting it to the legislation currently in force.

40. GS-7.7 Radiological control of drinking water. Rev. 1 January-1994. This Safety Guide is currently undergoing technical and administrative revision with a view to adapting it to the legislation currently in force.

41. GS-8.1 Physical protection of nuclear materials at nuclear and radioactive facilities. March-2000. This Safety Guide is currently undergoing technical and administrative revision with a view to adapting it to the legislation currently in force.

42. GS-9.1 Control of the low and intermediate level radioactive waste solidification process. July -1991.

43. GS-9.2 Management of solid radioactive waste materials generated at radioactive facilities. December-2001.

44. GS-10.1 Basic guide on quality assurance at nuclear facilities. Rev.2 February-1999
45. GS-10.2 System of documentation subject to quality assurance programmes at nuclear facilities. Rev. 1 July-2002
46. GS-10.3 Quality assurance audits. Rev. 1 November-2001.
47. GS-10.4 Quality assurance for the start-up of nuclear facilities. September-1987. This Safety Guide is currently undergoing technical and administrative revision with a view to adapting it to the legislation currently in force.
48. GS-10.5 Quality assurance for processes, testing and inspections at nuclear facilities. Rev.1 July-1999. This Safety Guide is currently undergoing technical and administrative revision with a view to adapting it to the legislation currently in force.
49. GS-10.6 Quality assurance in the design of nuclear power plants. Rev. 1 April-2002.
50. GS-10.7 Quality assurance at operating nuclear facilities. Rev.1 April-2000. This Safety Guide is currently undergoing technical and administrative revision with a view to adapting it to the legislation currently in force.
51. GS-10.8 Quality assurance for the management of elements and services for nuclear facilities. Rev. 1 January-2001. This Safety Guide is currently undergoing technical and administrative revision with a view to adapting it to the legislation currently in force.
52. GS-10.9 Quality assurance for computer applications relating to the safety of nuclear facilities. October -1998. This Safety Guide is currently undergoing technical and administrative revision with a view to adapting it to the legislation currently in force.
53. GS-10.10 Qualification and certification of personnel performing non-destructive tests. February -2000. This Safety Guide is currently undergoing technical and administrative revision with a view to adapting it to the legislation currently in force.
54. GS-10.11 Quality assurance at first category radioactive facilities. November -2000. This Safety Guide is currently undergoing technical and administrative revision with a view to adapting it to the legislation currently in force.
55. GS-10.12 Radiological control of scrap recovery and recycling activities. February-2003.
56. GS-10.13 Quality assurance for the dismantling and decommissioning of nuclear facilities. 2004.

Annex B

Process of licensing nuclear and radioactive facilities

The process of licensing both nuclear and radioactive facilities is governed by the Regulation on Nuclear and Radioactive Facilities (Span. *Reglamento de Instalaciones Nucleares y Radiactivas*, RINR), approved by Royal Decree 1836/1999, of December 3rd.

According to the RINR, these authorisations are granted by the Ministry of Industry, Tourism and Trade (Span. *Ministerio de Industria, Turismo y Comercio*, 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 (Span. *Consejo de Seguridad Nuclear*, 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.

On receiving the report from the CSN, and following whatever decisions or further reports 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 RINR, the following are nuclear facilities:

a) Nuclear power plants

b) Nuclear reactors

c) Manufacturing facilities using nuclear fuels to produce nuclear substances and those at which nuclear substances are treated

d) Facilities for the permanent storage of nuclear substances

In compliance with the RINR, 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.

a) 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

authorisation 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:

- ✓ Declaration of the needs to be covered and justification of the facility and of the site selected.
- ✓ Descriptive report on the fundamental elements making up the facility, along with basic information on the said installation.
- ✓ Preliminary construction project, including the phases and schedule for performance and a preliminary economic study of the financial investments and costs foreseen.
- ✓ Study on characterisation of the site and of the area of influence of the facility.
- ✓ Organisation foreseen for supervision of the project and quality assurance during construction.
- ✓ 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.

b) 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:

- ✓ General design of the facility
- ✓ Procurement schedule
- ✓ Budget, financing, performance schedule and framework for technical collaboration
- ✓ Economic study, updating the one submitted with the previous request
- ✓ Preliminary safety analysis, which in turn should include the following:
  - ➪ Description of the site and surrounding area
  - ➪ Description of the facility
  - ➪ Analysis of foreseeable accidents and their consequences
  - ➪ Radiological analysis study
  - ➪ Update on the organisation foreseen by the requesting party for supervision of project performance and quality assurance during construction
  - ➪ Organisation foreseen for future operation of the facility and preliminary operating personnel training programme
  - ➪ Pre-operational radiological environmental monitoring program
  - ➪ Quality assurance programme for construction

- ✓ Technological, economic and financing forecasts for dismantling and decommissioning.
- ✓ 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.

c) 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.

The licensee is required to submit the following documents in order to obtain the operating permit:

- ✓ Safety study: This must contain sufficient information for performance of an analysis of the facility from the point of view of nuclear safety and radiation protection, and must refer to the following issues:
  - ➪ Complementary data on the site and its characteristics obtained during construction
  - ➪ Description of the facility and of the processes that will take place in it
  - ➪ Analysis of foreseeable accidents and their consequences
  - ➪ Analytical radiological study of the facility
  - ➪ Operational radiological environmental monitoring program.
- ✓ Operating regulation: This should contain the following information:
  - ➪ List of job posts entailing nuclear responsibility
  - ➪ Organisation and functioning of the personnel
  - ➪ Operating standards under normal and accident conditions
- ✓ Operating technical specifications (OTS's): These will include the limit values for variables affecting safety and the minimum operating conditions.

- ✓ Site emergency plan: This will detail the measures foreseen by the licensee and the assignment of responsibilities to address accident conditions.
- ✓ Nuclear testing programme: This will describe the tests, their objective, the specific techniques to be used and the results expected.
- ✓ Quality assurance manual: This will establish the scope and content of the quality programme applicable to safety-related systems, structures and components.
- ✓ Radiation protection manual: This will include the facility's radiation protection standards.
- ✓ Radioactive waste management plan: This will include a system for the possible declassification of such wastes.
- ✓ Final economic study: This will analyse compliance with the economic and financial forecasts and establish the full and effective cost of the facility.
- ✓ Decommissioning and dismantling forecasts: This will establish the final disposal arrangements foreseen for the wastes generated and include a study of the cost and the economic and financial forecasts to guarantee decommissioning.

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.

d) Authorisation for modification

The RINR establishes that all modifications to the design or to the operating conditions that affect the nuclear safety or radiation 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:

- ✓ Technical description of the modification
- ✓ Safety assessment
- ✓ identification of the documents that would be affected by the modification
- ✓ 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:

- ✓ General description of the modification, identifying the underlying causes for it
- ✓ Standards to be applied in the design, construction, assembly and testing of the modification
- ✓ Basic design of the modification
- ✓ Organisation foreseen and quality assurance programme for performance of the project
- ✓ 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
- ✓ Destination of equipment to be replaced
- ✓ Procurement plan and budget in the case of major modifications

e) Decommissioning permit

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:

- ✓ Safety analysis
- ✓ Operating regulation
- ✓ Technical specifications applicable during the dismantling phase
- ✓ Quality assurance manual
- ✓ Radiation protection manual
- ✓ Site emergency plan
- ✓ Radioactive waste management plan
- ✓ Site restoration plan
- ✓ Economic study of the dismantling process and financial arrangements to address it

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.

2. System for the licensing of radioactive facilities

According to the RINR, radioactive facilities are understood to be as follows:

a) Facilities of any type that contain a source of ionising radiations

b) Apparatus producing ionising radiations and operating at a difference of potential in excess of 5 kV

c) 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.

First category radioactive facilities are those involved in the nuclear fuel cycle and industrial irradiation installations.

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.

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.

The request for the operating permit for radioactive facilities with scientific, medical, commercial or industrial purposes shall be accompanied by the following documents:

✓ Descriptive report on the facility

✓ 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.

✓ Verification of the facility: Containing a description of the tests to which it has been subjected

✓ Operating regulation: Practical measures guaranteeing the safe operation of the facility

✓ List of foreseen personnel, organisation and responsibilities of each job post

- ✓ Site emergency plan: Measures foreseen and assignment of responsibilities to address accident conditions
- ✓ Arrangements foreseen for decommissioning and economic coverage to guarantee it

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.

Modifications to the design or operating conditions or affecting the conditions imposed upon a radioactive facility will require an authorisation that will be subject to the same arrangements as applied in awarding the operating permit.

Requests for the declaration of decommissioning shall be accompanied by the following documentation:

- ✓ Technical decommissioning study
- ✓ 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, and La Rioja[1].

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 38/1995, of December 12th, 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 Par-

[1]The third additional provision of Law 15/1980, by which the CSN was created, empowers this Organisation to commission to the Autonomous Communities the exercising of certain functions attributed to it. Nevertheless, these commissions do not constitute transfers, since, in accordance with the Law by which it was created, the responsibility for nuclear safety is exclusively to the CSN throughout the entire national territory.

ticipation 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 RINR 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[2] 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 RINR also requires that an information Committee be in operation during the construction, operation and dismantling of nuclear power plants, the missions of which 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.

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.

---

[2] Legislative RD 1302/1986 of Environmental Impact Assessment, completed by RD 1131/1988 and amended by Law 6/2001.

Annex C

References to offical national and international reports relating to safety

National Reports

- ✓ Annual CSN reports to the two Houses of the Spanish Parliament.
- ✓ Decisions on nuclear safety and radiation 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 Congress Commission of Industry and Energy of the Congress.

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.

Annex D

References to the reports of international examination missions performed on request by a contracting party

None exist to date.

Annex E

Article 25. 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 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 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 ERO operates basically from an Emergency Room (SALEM). This is on permanent alert and is manned by shifts, with an emergency stand-by team capable of responding to emergency situations within one hour.

The SALEM is equipped with adequate communications systems and evaluation tools (described in the first national report on the Joint Convention) designed to advise the emergency plan directors of the level of off-site response to be activated, the evolution of the accident, its potential consequences and the protective measures to be implemented. The SALEM is currently undergoing a far-reaching process of transformation, both architecturally and as regards its communications system, aimed at substantially improving its ergonomic and operational characteristics.

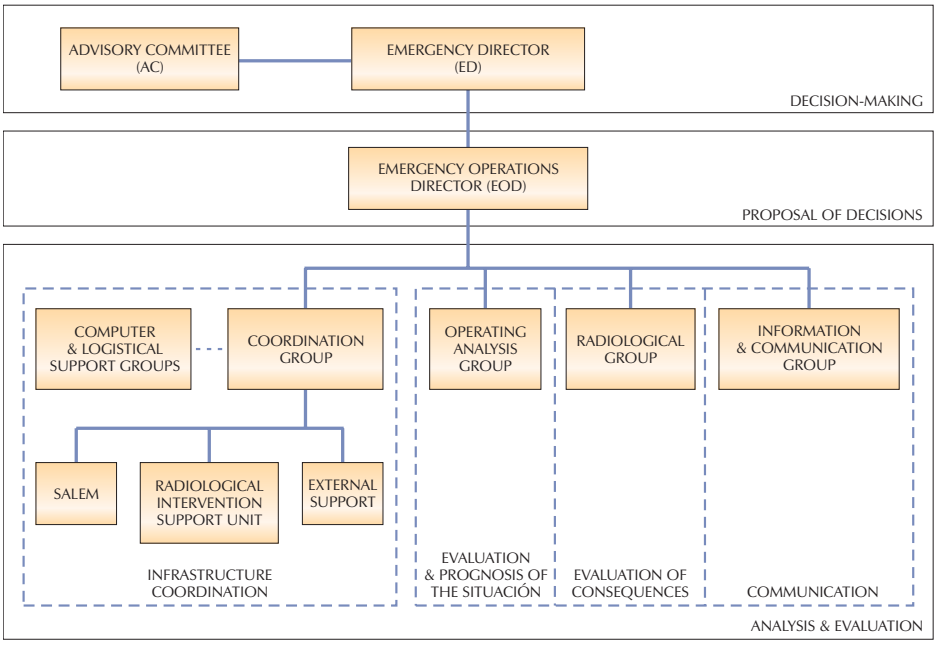
The CSN Emergency Response Plan includes a personnel training plan that is part of the training plan for those required to intervene in the emergency plans affecting the fa-

cilities and the areas in which they are located. 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 Plenary of the CSN, is responsible for directing 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 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 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.

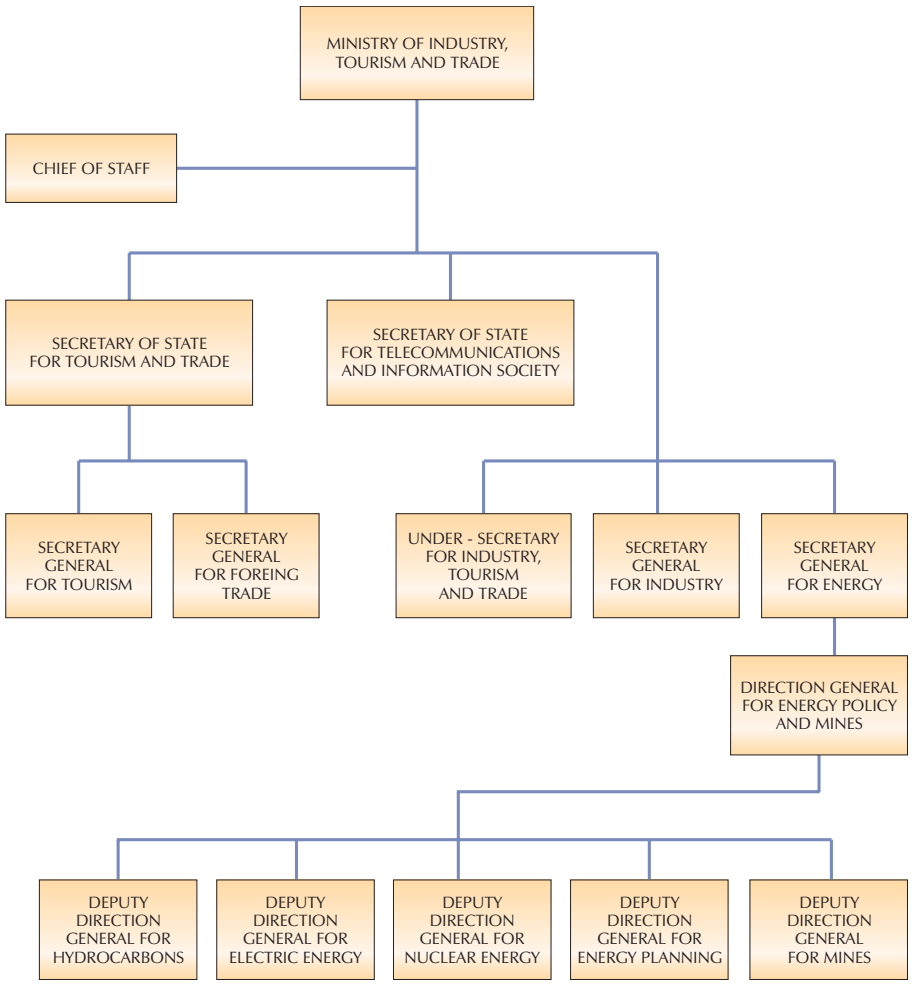
The structure of the ERO is variable and adapts to different levels of response as regards the composition of its staff: permanent (SALEM), reduced (stand-by teams), basic and extended.

The ERO may operate in four Response Modes (from 0 to 3). It is permanently activated in a state of alert, or Mode 0, through the operation of the SALEM and is activated in one of the other three Response Modes depending on the severity, complexity or duration of emergencies.

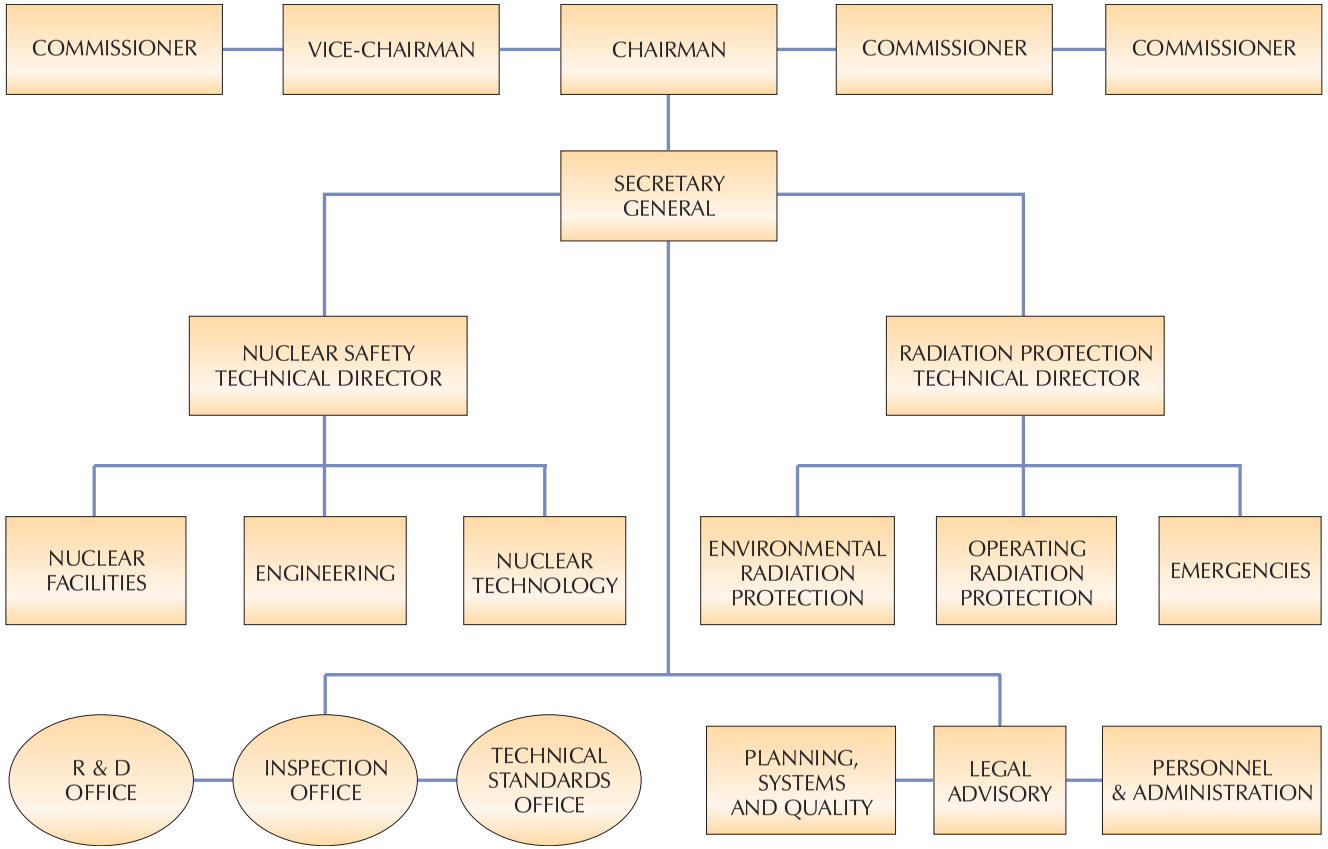
Annex F

Organisational flowcharts of the organisations and institutions involved in the management of radioactive waste and spent fuel

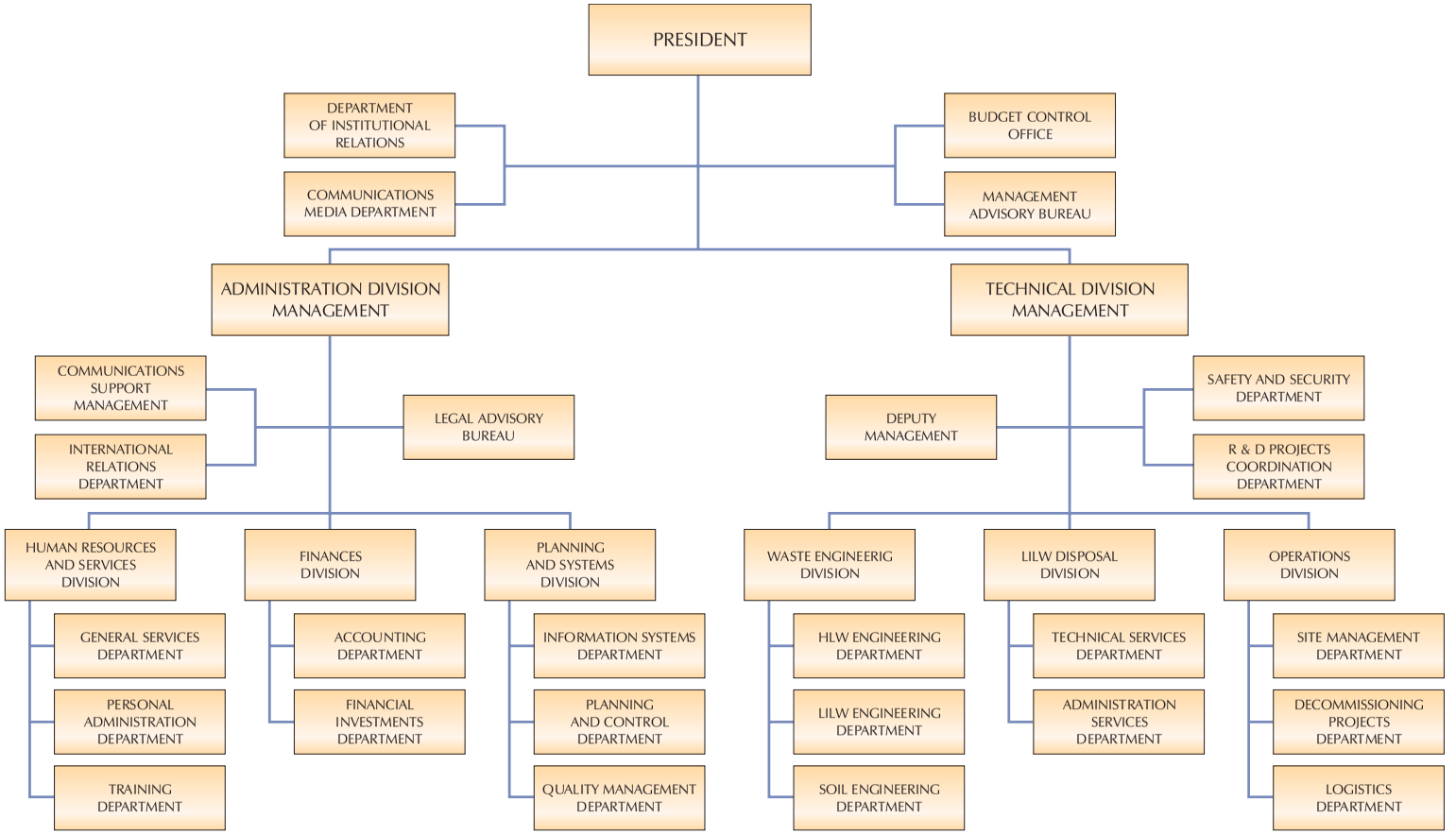
1. Ministry of Industry, Tourism and Trade (MITYC)



2. Nuclear Safety Council (CSN)



3. ENRESA



Date of approval: 7-9-05

Annex G

Initials and abbreviations used

ALARA	*As Low As Reasonably Possible*
AMAC	*Assotiation of Municipalities with Nuclear Power Plants*
AUM	*Andújar Uranium Mill*
B.O.E.	*Span. Boletín Oficial del Estado (Official State Gazette)*
BWR	*Boiling water reactor*
CFR	*United States Code of Federal Regulations*
CIEMAT	*Centro de Investigaciones Energéticas, Medioambientales y Tecnológicas (Centre for Energy-Related, Environmental and Technological Research)*
CSN	*Span. Consejo de Seguridad Nuclear (Nuclear Safety Council)*
DCP	*Design change package*
DF	*Disposal facility*
D.G.	*Directorate General*
DGD	*Deep geological disposal*
DGCD & E	*Span. Dirección General de Protección Civil y Emergencias (Directorate General for Civil Defence and Emergencies)*
EC	*European Community*
ECURIE	*European Union system for the 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.*
EURATOM	*European Atomic Energy Community*
HIFRENSA	*Hispano Francesa de Energía Nuclear, S.A.*
HLW	*High level waste*
IAEA	*International Atomic Energy Agency*
ICRP	*International Commission for Radiological Protection*
INEX	*International nuclear emergency exercise*

INPO	*Institute of Nuclear Power Operations*
ISF	*Industrial Storage Facility*
ISO	*International Standards Organisation*
JEN	*Junta de Energía Nuclear (Nuclear Energy Board)*
KWU	*Kraftwerk Union A.G.*
LEN	*Span. Ley de Energía Nuclear (Nuclear Energy Act)*
LILW	*Low and intermediate level waste*
MIMA	*Span. Ministerio de Medio Ambiente (Ministry of the Environment)*
MINECO	*Span. Ministerio de Economía (Ministry of Economy)*
MINER	*Span. Ministerio de Industria y Energía (Ministry of Industry and Energy)*
MITYC	*Span. Ministerio de Industria, Turismo y Comercio (Ministry of Industry, Tourism and Trade)*
NEA-OECD	*OECD Nuclear Energy Agency*
NPP	*Nuclear power plant*
NUREG	*NRC technical publication*
ODCM	*Off-site Dose Calculation Manual*
OECD	*Organisation for Economic Cooperation and Development*
OI	*Operating instruction*
O.M.	*Span. Orden Ministerial (Ministerial Order)*
OSPAR	*Convention for the protection of the north-east Atlantic marine environment*
OTS's	*Operating Technical Specifications*
PCP	*Process control programme*
PEN	*Span. Plan Energético Nacional (National Energy Plan)*
PGRR	*Span. Plan General de Residuos Radiactivos (General Radioactive Waste Plan)*
PIMIC	*Span. Plan Integrado para la Mejora de las Instalaciones del Ciemat (Integrated Plan for Improvement of the Ciemat facilities)*
PLABEN	*Span. Plan Básico de Emergencia Nuclear (Basic Nuclear Emergency Plan)*
PSA	*Preliminary Safety Analysis*
PSR	*Periodic Safety Review*
PWR	*Pressurised water reactor*
R.D.	*Royal Decree*
REMP	*Radiological Environmental Monitoring Program*
R.G.	*NRC Regulatory Guideline*
RINR	*Span. Reglamento de Instalaciones Nucleares y Radiactivas (Regulation on Nuclear and Radioactive Facilities)*

RPIR	*Regulation on Protection against Ionising Radiations*
RWMP	*Radioactive Waste Management Plan*
R&D	*Research and Development*
SA	*Safety Analysis*
SACOP	*Span. Sala de Coordinación Operativa (Operations Coordination Room)*
SALEM	*Span. Sala de Emergencias del CSN (Emergency Room) of the Nuclear Safety Council)*
SEPI	*Span. Sociedad Española de Participaciones Industriales (Spanish State Industrial Holding)*
SG	*Safety guide*
SF	*Spent fuel*
SFSP	*Spent fuel storage pool*
UKAEA	*United Kingdom Atomic Energy Authority*
UNESA	*Spanish Electricity Industry Association*
UPC	*Polytechnic University of Catalonia*
US-NRC	*United States Nuclear Regulatory Commission*
WANO	*World Association of Nuclear Operators*