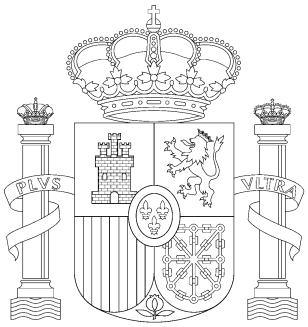

SPAIN

Convention on Nuclear Safety

Fourth National Report

September 2007

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Introduction

Presentation of the Report

The present document is the Fourth Spanish National Report issued in compliance with the obligations deriving from the Convention on Nuclear Safety, done in Vienna on 20th September 1994.

The Convention came into force on 24th October 1996 following ratification by a minimum number of countries, in accordance with articles 30, 31 and 32. It was signed by Spain on 15th October 1994 and ratified by means of an instrument issued by the Ministry of Foreign Affairs signed by HM the King on 19th June 1995.

Articles 5, 20, 21 and 22 establish the periodic submittal by each Contracting Party to all the other such Parties of a Report on the measures adopted during the period in compliance with the obligations of the Convention, which shall be submitted and subjected to examination the subsequent Review Meeting.

The first such meeting was held in Vienna in 1999, the second one in 2001 and the third in 2006. In these occasions the Consejo de Seguridad Nuclear (Spanish Nuclear Safety Council) (CSN) represented Spain both by drawing up the report and by participating in the meetings between the Parties. On the third occasion, and in keeping with the commitments adopted during the second meeting, the electricity industry participation was fully active in all the review phases. This will also be the case in this fourth occasion.

This Fourth Report is an update of the third and, is to be submitted by 28th September 2007, in accordance with the resolution approved during the third review meeting. As a result, its contents cover the data and circumstances existing and occurring during the period from July 2004 to December 2006 (including these two months).

This Report will be subject to review by the countries interested, which will submit their comments and questions in advance to the meeting. In April 2008, the Spanish Report and the replies to the questions received will be subject to the process of review contemplated in the Convention, along with the Reports submitted by the other Countries.

Drawing up of the Fourth Report on the Convention on Nuclear Safety

The Report has been drawn up by the Nuclear Safety Council, the only organization responsible for nuclear safety and radiation protection in Spain, independent from the Government and that reports only to the Parliament. The licensees of the Spanish nuclear power plants, coordinated by the Spanish Electricity Industry Association (Unesa), and the Ministry of Industry, Tourism and Trade have also contributed to the report.

The Report has been drawn up following the same structure as the articles of Chapter 2 "Obligations" of the Convention, starting from article 6. In each article, relevant information has been included on the contest of each obligation, a distinction being made in separate articles between the activities of the licensee and the regulatory body, as well as a brief evaluation of the degree of compliance in Spain with the requirements established therein.

A chapter on conclusions has been added, with a view to dealing with the commitments of the third review meeting, as requested in the guidelines, and to underlining the challenges of the future and the initiatives mapped out for implementation in the near future.

The Report has several appendixes, the aim of which is to enlarge upon the information provided in the articles.

The process of drawing up the Report has been based on an initial draft submitted for comments that, once complete, was sent to the Plenary Meeting of the Nuclear Safety Council for definitive approval, in Spanish and English versions. The document is submitted to the Atomic Energy Agency (IAEA), as trustee of the Convention, and is incorporated in the CSN website along with the first, second and third reports and related questions and answers. The IAEA will be requested to include these documents in its website for them to be generally accessible.

Unesa, in representation of the licensees, has been an integral part of the group in charge of drawing up the report, providing the necessary texts and data and participating in the comments and decisions relating to its creation. The initial draft has also been submitted for comments within its organisation, which have been included in this report preserving the independence of the criteria and opinions of the Association.

The report was submitted to the Ministry of Industry, Tourism and Trade for comments, and to the Ministry of Foreign Affairs for its delivery to the IAEA.

The content and scope of the fourth Report on the Convention are based mainly on the Convention on Nuclear Safety itself, taking as the starting text the Third National Report and the "Guidelines regarding national Reports under the Convention on Nuclear Safety"[1], established by the Contracting Parties in accordance with article 22, taking into consideration other documents such as the "Summary Report of the Third Review Meeting", and the conclusions for Spain in the Third Review Meeting, as well as the comments and questions received from other Countries on previous occasions.

Generally speaking and in accordance with the requirements of the guidelines relating to the national reports, the objective of the fourth report is to allow for the efficient assessment of compliance with the Convention by Spain. The first, second and third reports submitted by Spain in 1998, 2001 and 2004, respectively, are understood still to be valid as general information on regulatory practices, this fourth report serving as an update on the changes that have occurred during the last three years. The previous reports remain valid as regards those issues that have not undergone modification.

The Report includes the data and analyses required to show the evolution of nuclear safety in Spain from July 2004 to December 2006, and takes into account the general issues included in the summary of the third review meeting, avoiding repetition of generic information included in previous national Reports.

[1] INFCIRC/572/Rev. 2, 2nd September 2002

Chapter 2. Obligations

a) General provisions

Article 6. Existing Nuclear Facilities

This article describes the most relevant safety issues and improvement programmes that have been developed since the last national report in relation to the operating nuclear power plants in Spain. Appendix 6.A summarises updated data on the nuclear facilities existing in Spain and included within the scope of the Convention.

6.1 Nuclear safety issues of greatest significance for each plant during the period

The most significant safety issues that have occurred at each Spanish nuclear power plant during the period considered is detailed below.

José Cabrera Nuclear Power Plant

During the period covered by this report, the José Cabrera NPP has operated with an operating license valid from 15th October 2002 until 30th April 2006. Since this date the plant is in a permanent cessation of operation condition until the dismantling authorisation is obtained.

In October 2001 the licensee requested renewal of the operating license from October 2002 (the expiry date of the previous permit) to October 2008, when the plant would have reached 40 years of operation. However, the Ministry of Economic, following a binding report from the Nuclear Safety Council, granted authorisation only until 30th April 2006.

The permanent cessation of operation has entailed a significant reduction of requirements for the José Cabrera NPP, since all those related to power operation have been eliminated. Practically all licensing documents have been revised based on the accident and risk analysis that the licensee carried out for the new situation. The risk analysis reveals that the estimated frequency of core damage is 100 times lower than with the plant in operation.

The more relevant systems from the standpoint of safety of the installation are the spent fuel pool cooling system and those pertaining to the residual heat removal system (essential service water system and component cooling water system) besides the electrical system. The major part of the other systems: protection, safeguards, those related to the secondary system, auxiliary feedwater, safety injection, chemical and volume control system, etc. do not have any safety function in this new phase; nevertheless, in some cases, they are relevant for the shutdown condition.

The control of systems important for the shutdown condition has been included in specific programmes that incorporate tables showing the conditions, actions and monitoring criteria for control of the equipment and components important for the safety

of the installation. Such programmes are binding and similar in nature to the Operating Technical Specifications.

Throughout the last part of 2006 and the beginning of 2007, activities are being developed that are important for the safety and radiological protection during the future nuclear plant dismantling (decontamination of the primary system components, site characterization, storage of the spent fuel in dry storage casks, due to the Spanish regulations require that prior to begin dismantling the installation all the spent fuel have to be removed from the reactor and spent fuel pools). The licensee applied, in 2005, for an authorization to build and operate an independent spent fuel storage facility on site. The request was processed as a significant design modification and the authorization was granted on December 2006.

Santa María de Garoña Nuclear Power Plant

During the period covered by this Report the Plant was shutdown twice for refuelling, in February 2005 and February 2007.

Two reportable events were classified as Level 1 of the INES scale. These were:

- First one: on 14th March 2005, the licensee identified an anomaly in the Standby Gas Treatment Systems (SBGT) consisting in the recirculation of part of the flow of Loop A, that was in operation, through the Loop B thereof.

  While checking the closure of one of the isolation valves of the reactor building ventilation system, the instrument air flow to those valve actuators was stopped and the SBGT Loop "A" was manually started in order to maintain the ventilation of the Reactor Building. SBGT Loop B was in maintenance and the corresponding air instrument flow was shut off. Upon starting the SBGT Loop "A" some flow anomalies appeared, being not possible to reach the nominal flow rate. It was verified that the SBGT lacked the check valves that would have avoided such flow derivation upon air instrument loss.

  The licensee carried out a design modification consisting in the installation of check valves in both "A" and "B" loops, the change of the fail mode of the air operated flow control valves in the two loops, the installation of alarms to alert in case of control signal loss in both loops and the replacement of the fan motors of the two loops.

  The event had no consequences for the personnel or the environment.

- Second: on 17th November 2005, the licensee identified the inoperability of the temperature indication of the primary containment atmosphere.

  On 16th November 2005, the readings of the post-accident thermocouples, which provide indication of the primary containment temperature in Control Room, were checked. During the checking, it was found that the cables of the thermocouples were using a non-compensated penetration to the Secondary Containment, causing an indication error. The cables were replaced during the refuelling outage in March 2005.

  On 17th November 2005, an analysis was performed on the magnitude of the error in the primary containment atmosphere temperature indication in case of a Design Basis Accident, assuming the most unfavourable temperature differences through the penetration, and the instrumentation was declared inoperable.

  The first anomalous indications of this instrumentation had been observed in April 2005.

The penetration was replaced with a compensated penetration on 18th November 2005 and the above mentioned instrumentation was declared operable.

The event had no consequences for the personnel or the environment.

Almaraz Nuclear Power Plant

On 29th July 2004, it was known that calibration errors in the steam generator level transmitters of a Spanish nuclear power plant were possible due to the incorrect application of a static pressure correction on those transmitters. It was also known the information notice of the transmitters' manufacturer, Rosemount, to the power Plant, clarifying the right manner of making the correction.

Once that the problems associated to the steam generators level transmitters calibration were known and that the manufacturer was the same for Almaraz NPP transmitters, an investigation was launched on the applicability of this problem to Almaraz NPP.

The analysis carried out revealed the existence of an error in the calibration of the SGs' narrow range and wide range transmitters since their initial mounting. Upon detection, the inoperability of all transmitters was declared, entering into the Limiting Condition for Operation (LCO) 3.0.3 of the Plant Operating Technical Specifications entailing the need of transmitter recalibration.

The calibration error caused an excessive level indication ranging from 2,05% when the actual level was 0%, to 0,55% when actual level was 100%, with a deviation of 1,8% for the SG low level reactor trip set point and 1,04% for the SG high level turbine trip set point.

The incident had no consequences for the personnel or the plant and it didn't cause any loss of availability.

The Nuclear Safety Council categorized the incident as Level 1, "Anomaly", according to the INES scale.

Ascó Nuclear Power Plant

The on-line inspection of fuel assemblies has been carried out using the "in mast sipping" method. Other inspection and tests carried out included: the containment penetrations leak rate test (ILRT); mechanized reactor vessel inspection; and the control room habitability tests according to ASTM 741 Standard "Determining air change in a single zone by means of a tracer gas dilution" relating to the Generic Letter 2003-01, "Control Room Habitability".

During the Unit 2 refuelling outage that took place in March-April 2007, the filtering surface of the containment sumps has been increased in response to the Generic Letter 2004-02 "Potential impact of debris blockage on Emergency Recirculation during DBA's at PWR"; the control room toxic gas detection system has been changed, incorporating acrylonitrile detection in compliance with RG 1.78; pre-action sprinklers have been installed in mechanical penetrations filtering units in compliance with BTP 9.5-1; and, for the first time, the water flow rate test of the make-up lines to the safeguards service water cooling towers from the water storage basin has been performed.

Cofrentes Nuclear Power Plant

During the period covered by this Report, Cofrentes NPP has operated at its maximum rated power (3,273 MWth, equivalent to 111,85% of the original rated thermal power), except during the programmed shutdown periods for carrying out maintenance activities,

including the refuelling outage that took place between 15th May and 27th June 2005 and the downtimes due to scrams.

During the 2005 refuelling outage small leaks were detected in the reactor vessel pedestal. A video-endoscope inspection determined that the leaks came from 7 insertion lines and 1 extraction line of the Control Rod Drive Housings (CRDH), all of them located in quadrant 2 of the dry-well penetration. Cofrentes NPP replaced all piping in the affected quadrant 2 during the refuelling and determined the root cause of the degradation effect, establishing a monitoring plan for the next cycle in order to detect any small leak that might occur.

From the root cause analysis and the previous experience of similar BWR plants, the conclusion was that all defects found in the piping were caused by a localized stress corrosion degradation process in the presence of contaminants (chlorine) that seemed to affect, in different degree, to all piping in the four quadrants. Visual inspections performed on the piping of the CRDHs at the dry-well penetrations in the other quadrants, found a layer of dust on the piping and chloride concentrations similar to those found on the piping of quadrant 2, concluding that the degradation mechanism could be initiated or incipient in some pipes located in quadrants 1, 3 and 4. On the other hand, the impossibility to detect the defect until it developed a through-wall crack was established. Due to the aforementioned reasons, it was decided to proceed to the replacement of all piping during the 2007 refuelling outage.

Once the decision was taken, and since the replacement of this piping entails inevitable and subsidiary tasks of removal of instrumentation wires and supports, the work done involved a great number of modifications and improvements of the affected zone, including several design modifications on core instrumentation wires.

Vandellós II NPP

On 25th August 2004, when the nuclear plant was operating at rated power, a rupture occurred in an access manhole to the train B line (Bonna pipe) of the essential service water system, during the start up of the train B essential service water pump. After declaring the train inoperable, the licensee decided to bring the plant to hot standby and repair the ruptured manhole. The repair was temporary, valid until the March 2005 refuelling outage when it was removed and a definite repair of the manhole was performed. The rupture was due to widespread external corrosion around the manhole neck.

After the aforementioned repair and the declaration of operability of train B, train A of the same system was removed from service upon detection of a loss of wall thickness due to corrosion at the train A manhole neck in a symmetrical location with respect to the failed train B manhole which caused the plant shutdown. The licensee decided to make a temporary repair of this manhole similar and under the same conditions to the repair performed earlier.

The licensee measured the thickness in all manholes of both essential service water trains, verifying that there was widespread thickness loss of different degree, with respect to the nominal value, in the neck of all of them. In addition, it was found that a new manhole different from the failed one was oozing. It was repaired immediately afterwards using a technique different from that used in the repair of the two manholes mentioned above. In this occasion, the licensee decided to install an external reinforcement, made of reinforced concrete, around the affected manhole neck instead of replacing it. This repair was also temporary, under the same validity conditions as the previous ones.

The licensee declared the operability of the essential service water train B with the oozing manhole and later, on 29th August, started the Plant reaching full power the following day, 30th August.

After this start up, the licensee carried out several repair actions on manholes of the essential service water system to ensure their structural integrity and, coinciding with the scheduled refuelling outage of the year 2005, initiated, on 15th March 2005, an extended shutdown to inspect, review and repair, when necessary, the plant systems and specifically the essential service water system, which lasted until 3rd September of that year.

During this period, the CSN carried out a detailed analysis of the licensee performance relating to the essential service water system, identifying some organizational and safety management deficiencies of the licensee operating organization as root causes of the incident. CSN also identified the technical reasons that led to the incident. At the suggestion of the CSN, the Ministry of Industry Commerce and Trade initiated disciplinary proceedings against the licensee that finally resulted in three fines for serious misconduct totalling 1,6 million euros.

As a consequence of the findings, the CSN requested the licensee to elaborate an Action Plan for Safety Management Improvement with the aim of eliminating the identified technical and management causes that led to the incident, with the perspective of extending it to all systems and the whole licensee's organization.

A consequence of the above actions and particularly of the Action Plan was the significant changes made in the operating organization aimed to reorientate the Plant Safety Management in the right direction.

On the other hand, the Nuclear Safety Council performed the following actions in connection with the aforementioned operating incident:

- Categorize the incident as level 2 on the INES scale.
- Approve the Action Plan for Safety Management Improvement, revision nº 2, on 12th August 2005.
- On 25th July 2006, the CSN agreed to report favourably on the approval of revision nº 17 of the Operation Manual, introducing organizational changes in accordance with the Action Plan for Safety Management Improvement.

From 27th August to 27th September 2006, the licensee brought the nuclear plant to a planned shutdown to replace all the split pins fastening the control rod guide tubes of the reactor upper internals.

This shutdown was the result of the operating condition caused by the rupture of one split pin of the control rod guide tubes in March 2006, which was specifically monitored by the CSN. The condition created as a consequence of the split pin rupture, led to a declaration of anomalous condition to reflect the situation of the reactor vessel internals and, in addition, initiated a process of formal change of the licensing basis of the pressure boundary at the steam generator tube plates, due to the damage produced on a sealing weld of the tube plate of a steam generator.

After detecting the split pin rupture at the end of March 2006, the nuclear plant was brought to shutdown on licensee's initiative and while remaining in this condition, the licensee analysed the impact of the final situation of the reactor core, concluding that it had not a negative impact on plant safety. He also performed the safety analyses supporting technically the aforementioned licensing basis change. Once that the CSN carried out the assessments verifying the licensee's conclusions and issued its report favourably appreciating the licensing basis change, the licensee started the plant after a 32 days shutdown.

During the planned shutdown initiated on 27th August, which had duration of 31 days, the licensee replaced all split pins of the control rod guide tubes in the reactor vessel, solving definitely the anomalous condition declared after the rupture of one split pin.

On 26th April 2006, the CSN agreed to report favourably the licensing basis change related to the reactor coolant pressure boundary in the tube plate of the steam generators and the proposal of change to the Safety Analysis Report associated to the licensing basis change.

Trillo NPP

In July 2004, within the programme to cope with severe accidents, the CSN favourably appreciated the licensee's request for nor did implementing the design modification of the containment filter venting system. On the other hand, the CSN decided to ask for a project plan for application of a cost-benefit analysis as part of the licensing process before taking the final decision on the implementation of the design modification to perform the "feed and bleed" of the primary system. This project plan was favourably appreciated on 11st December 2005 and since them the work has continued on the different project stages.

On 16th November 2004, the operating license renewal for a 10 year period was approved. As a conclusion of the review carried out, the licensee was requested to submit, within a six months term, the environmental qualification reports for some safety cables that lacked that qualification. If that was not possible, the licensee had to perform the relevant qualification tests prior to 31st December 2005. The licensee carried out those tests within the set time and found that all wires pass the tests for a life of 40 years.

During the period covered by this Report, all nuclear power plant events have been classified as Level 0 according to the INES scale.

6.2 Generic nuclear safety issues and regulatory practices initiated or completed during the period

The most significant novelties that have occurred since June 2004 as regards regulatory practices are the following:

a) CSN Instruction on nuclear power plant reportable events (IS-10)

In November 2006, the CSN issued a new CSN Instruction, IS-10, defining the *criteria for reporting nuclear power plant events*. This instruction defines notification periods for different types of events (1 hour or 24 hours), the notification means, the criteria for sending additional information and for reviewing the issued reports, as well as the formats for notification and the information that has to be included in the licensee event report (30 days after it occurred or was detected): correlative number, revision, date and time of the occurrence or detection, thermal power before and after the event, applicable notification criteria, short description of the event, plant condition at the time of notification, radioactive material releases, related background and operative experience, initial conditions, chronological description, detailed event description and anomalies that have taken place, direct causes, description and conclusions of the root cause analysis, immediate and deferred corrective actions and licensee's conclusions.

On the other hand, the instruction includes 36 notification criteria, classified in 8 notification categories: records, occupational health and safety, releases, plant technical specifications, operation, safety systems, other risk situations not contemplated in the licensing documents, and external events. For the elaboration of these notification criteria, the notification systems of several countries have been analysed, as well as the existing experience on the preliminary notification system established in their technical

specifications. A revision to the Safety Guide 1.6 on *Notification requirements for NPP events* is being prepared, in which the IS-10 criteria will be clarified through the inclusion of practical examples.

b) Physical Protection of the Nuclear Facilities and Materials

In June 2002, the Nuclear Safety Council approved the integrated security model for nuclear and radioactive facilities and materials, which conceptually comprises the following: a) the internal facilities and practices security system, under the responsibility of the licensee, b) the off-site action and response plans, under the responsibility of the security forces and corps of the Spanish State, and c) the intelligence plans, under the responsibility of the Ministry of the Interior.

Since that time a security improvement plan has been carried out for the nuclear installations and materials, in order to adapt them to the integrated model, this including: clear identification, distribution and assignment of responsibilities among the different authorities and organisations participating in the national security system, a review of the existing regulatory framework for the security of nuclear facilities and materials, improvement of the facilities' security systems, equipment, procedures, and initial and on-going training plans for all the organisations involved.

On 7th July 2006, the CSN approved CSN Instruction IS-09 defining the technical criteria applicable to the security plans of the nuclear facilities, their protection systems, their security and watch services, the applicable procedures and the specific training for the guards of the facilities.

On the other hand, the amendment to the Convention on Physical Protection of Nuclear Material was ratified on July 2005.

In parallel, the authorities competent on the security of the nuclear facilities and materials – Presidency of the Government, Ministry of the Interior, Ministry of Defence, Ministry of Industry, Tourism and Trade, Ministry of External Affairs and Cooperation and the Nuclear Safety Council, have initiated the process of revising the Royal Decree 158/1995 on Physical Protection of Nuclear Materials in force, in order to, among other things, fully adapt it to the Amendment to the Convention on Physical Protection of Nuclear Material.

d) Clearance of waste materials containing very low activity levels

As has been mentioned in previous national reports, since 1995 the Association of the Spanish Electricity Industry (Unesa) has been drawing up and submitting to the Nuclear Safety Council common projects for the clearance of different waste materials generated at the nuclear power plants.

In 1999 the CSN addressed Complementary Technical Instructions to the nuclear power plants establishing the technical and administrative actions to be taken by the licensees in relation to the clearance of very low radioactivity wastes.

To date, the CSN has favourably assessed and has determined the conditions under which the clearance shall be carried out in the case of used oils, metallic materials, used active coal and spent ion exchange resins and wooden material.

Furthermore, the Ministry of Industry, Tourism and Trade, following a report by the CSN, has specifically authorised the clearance of the used oils with very low activity levels generated at the Trillo, Cofrentes, Almaraz and Santa María de Garoña nuclear power plants, the clearance of metallic materials at the José Cabrera plant and the clearance of active coal and spent resins at the Trillo NPP.

Since February 2001, Cofrentes nuclear power plant has been authorised specifically, and depending on certain conditions to declassify inert wastes (sludge) with very low activity levels.

In short, the Complementary Technical Instructions issued by the CSN to the Spanish nuclear power plants in 1999 established a route for the implementation of a clearance system for very low level radioactive wastes at these facilities.

The Spanish nuclear power plants responded to the Complementary Instructions with joint action programmes, coordinated by Unesa, and specific actions depending on their needs, determined by the inventories and types of very low level radioactive wastes stored at each plant.

The experience acquired in implementing clearance action programmes has shown that characterisation of the wastes in order to guarantee with a high level of confidence that their activity contents are lower than those established, is one of the most relevant aspects of the process and may occasionally be the factor determining its feasibility.

Once that practically all the Common Projects for clearance have been favourably assessed by the CSN, regulatory efforts will focus on improving the characterisation processes and on implementing methodologies for that purpose, enabling optimisation of the resources required for implementation without jeopardising quality.

6.3 Safety improvement programmes implemented at the Spanish nuclear power plants on the initiative of the regulator and/or licensee

6.3.1 Integrated Probabilistic Safety Assessment (PSA) programme

The majority of the PSAs have been updated since the last report. The overall quantitative results obtained for internal events at level 1 and level 2 in the latest versions of the PSAs are shown below in terms of core damage frequency (CDF), large early release frequency (LERF) and, in general, large release frequency (LRF), corresponding to the internal events at power and not including the frequency relating to fires or internal flooding, after being assessed by the CSN and updated by the licensees:

	CDF Frecuency (1/year)	LERF Frecuency (1/year)	LRF Frecuency (1/year)
Ascó NPP	2.92E-5	1.41-06	2.96E-6
Vandellós II NPP	3.51E-5	3.96-07	3.96E-7
Almaraz NPP	5.12E-6	1.35-06	1.35E-6
Cofrentes NPP	1.27E-6	1.15-07	1.39E-7
Trillo NPP	3.86E-6	2.40-07	2.42E-7
Garoña NPP	1.89E-6	5.17-08	1.49E-8 (*)

(*)More detailed information on PSA and its applications is included in section 14.4.

In accordance with the scope established in the second edition of the Integrated PSA performance Plan, the level 2 PSAs of all Spanish NPPs have been carried out and assessed by the CSN.

Currently, the CSN is assessing the PSAs for operating modes other than full power (APSOM) of the plants that submitted them last: Cofrentes, Almaraz and Trillo.

Regarding PSA applications, objective highlighted in the current version of the PSA Integrated Plan, the CSN has assessed several applications relating to changes in the Operating Technical Specifications, In-service Inspection Manual for piping or In-service Inspection Manual for valve and pump testing. Other assessments of this kind are currently under way.

Apart from PSA applications intended for assessing licensees' requests, it has to be underlined that the CSN has decided to use information on risk for CSN's internal processes; both for inspectors' internal use and for the inspection itself, as well as for supporting the process initiated at the CSN on the Plant Supervision Integrated System (SISC). In this process, initiated in 2005 and fully implemented in 2006, PSAs are used and applied both to the Indicators System, as the Performance Indicator of the Mitigation Systems (IFSM), and to the categorisation of the inspection findings in the 3rd phase of the Significance Determination Process (SDP).

6.3.2 Design Basis Review Programme

The Design Basis Review was carried out in accordance with criteria agreed on between the CSN and the Spanish nuclear sector in 1998, updated following the guidelines being used in the USA on this matter. Its purpose is to verify that the licensing requirements and basis are perfectly established and that the operating practices are coherent among them, with said requirements, and with the Safety Analysis Report. As a result of the design basis review, the licensees submitted to the CSN a report containing the results obtained and, where applicable, an update of the Plant Technical Specifications and Safety Analysis Report.

This review is useful to ensure the traceability and coherence of the design bases, the data and the operating practices of the Spanish nuclear power plants.

The CSN has evaluated in detail de Design Basis Review Programmes and has accepted both the process to perform the review and the conclusions for the Almaraz, Santa María de Garoña, José Cabrera and Cofrentes nuclear power plants, after revising in depth, in some cases, the initial studies following the CSN's assessment. The Ascó and Vandellós II NPP revisions are currently under way. Both plants belong to the same operator. In the Vandellós II case, the programme was interrupted shortly after the August 2004 event (rupture of an access manhole to an essential service water line) because a large programme of significant design modifications of the systems is being implemented in the 2005-2008 period and it has been considered more appropriate to complete it and then finish the design basis review. In the case of Ascó NPP, which shares the technical services' department with Vandellós II, the programme has experienced some delay because the priorities of the resources have been devoted to the Vandellós II modifications. In the Trillo NPP case, this design basis review process has not been carried out because a review of greater scope had been carried out earlier for other purposes.

6.3.3 Other generic nuclear safety improvement programmes

This section describes the generic issues that have given rise to actions by the licensees of the Spanish nuclear power plants during the period considered.

a) Rupture in a manhole of the essential service water system caused by widespread corrosion

The origin of this generic issue is the event that happened in Vandellós II NPP in August 2004. After analysing the causes, the event was considered of generic character because a series of important deficiencies in the management processes of inspection and maintenance and other of organizational nature were identified requiring an specific

analysis by the other Spanish NPPs, in order to determine whether the same type of deficiencies might occur and, in that case, to take early corrective actions to avoid such deficiencies. At the same time, the Commission of Industry, Tourism and Trade of the Congress of Deputies issued a series of resolutions urging the CSN to request actions from the rest of Spanish NPPs to analyse the implications and lessons learned from this event. As a result of the above, five complementary Technical Instructions were issued to all Spanish nuclear power plants, requiring to perform:

1. Applicability analysis from a technical and organizational point of view.
2. Assessment of Plant Safety Culture by an independent external organization.
3. Detailed review of the degradation mechanisms to which the safety related structures, systems and components might be subject to.
4. Review of design modifications important for the safety of the installation.
5. Review of the regulations applicable to the design, in-service inspection, testing and operation of all safety- related systems.

The responses of all Plants to the first Complementary Technical Instruction, related to the applicability analysis of the Vandellós II event, were received by the set date. The assessment of the responses concluded that even though the Plants have made a reasonable applicability exercise, taking into account the information and time available, the reports should be completed with additional information and also that the CSN would verify in the first semester of 2006, some relevant aspects of those analyses.

Revision 1 of the applicability analyses sent by the licensees expanded the content of the previous revision, taking into account:

- The current situation of each Plant.
- The "Action Plan for Safety Management Improvement", Revision 3, of the Ascó-Vandellós Nuclear Association (ANAV) and the available information on its implementation.
- The part applicable to the other Nuclear Power Plants of the CSN's Report on Lessons Learned, of 18 November 2005.
- Lessons learned from the Evaluation of the ANAV Governing Board carried out by WANO in October 2005.
- The assessment of revision 0 of the Applicability Reports presented by the CSN to the General Directors at the 24th February meeting.

In addition, to complete the information and actions requested by the ITC-1, the CSN carried out specific inspections of the nuclear power plants during the first semester of 2006 (excluding José Cabrera NPP that was close to its permanent cessation of operation)

The conclusion of the assessments and inspections carried out is that the applicability analyses of the Vandellós II event performed by the licensees are deemed adequate and incorporate improvement actions, the implementation of which will be followed by the CSN through the normal supervision mechanisms. Other additional conclusions are the following:

- The Spanish nuclear power plant licensees have made a reasonable analysis of applicability of the Vandellós II event, using all relevant information, that shall be completed with the analyses required in the other Complementary Technical Instructions, issued by the CSN in compliance with the Resolutions of Commission of Industry and Trade, and the additional analyses identified in the CSN assessment.

- No deficiency requiring immediate action has been identified. The identified improvement actions are deemed positive and, in many cases, are steps towards the improvement and update of the management practices, which will entail improvements in nuclear safety.
- No significant corrosion problem has been found in the piping (buried or not) of safety related or risk significant fluid systems in the inspections carried out.
- The CSN will perform follow up actions of the main argumental lines, on-going projects and programmes described by the licensee as well as of the implementation of the proposed improvement actions and their effectiveness, through the inspections on the Organization and Human Factors Programmes of the nuclear power plants included in CSN's Inspection Basic Plan and other inspections.

Other relevant generic issues that appear during the period covered by this Report are:

b) Reactor trip due to an auxiliary transformer protection actuation, followed by the start up and coupling of the diesel generator

The origin of this generic issue is the event that took place in Almaraz NPP Unit 2 on 2nd July 2004. The causes of the event were analysed and its generic character was determined because some important electric anomalies occurred that required an specific analysis by the other Spanish NPPs, in order to determine whether the same type of anomalies might occur and, in that case, to take early corrective actions to avoid such anomalies. The corrective actions relating to the electrical system were:

- Review the trip circuits of the intermediate voltage motors switches, determining whether similar protection devices exist that may disable the trip function when is required, taking into consideration those incidences that induce a trip and at the same time may disable the trip function.
- In this case, carry out the modification to improve the design avoiding the occurrence of a problem similar to that of Almaraz 2.
- Reanalyse the over current protection of normal buses, auxiliary generator transformer and start up transformers, especially from a selectivity standpoint.
- If deficiencies are found, perform the corrective appropriate actions.

After reviewing the information provided by the Spanish nuclear power plant licensees in their Operating Experience Annual Reports, it was detected that the analysis of the relevant reportable events had not been performed in some cases and insufficiently in other cases. For these reasons, the CSN requested through a Technical Instruction that the licensees performed an analysis of the reportable events or a revision of the analysis to include the aspects missing in the version sent to the CSN.

c) GL 2007-01. Inaccessible or underground power cable failures that disable accident mitigation systems or cause plant transients

The USNRC has issued this Generic Letter (GL) regarding underground electric cables or cables located in inaccessible places. Nuclear power plants shall analyse the condition of the cables related to mitigation systems or that might cause plant transients to check that the cables are not deteriorated. Before this GL was issued, the CSN had issued a Complementary Technical Instruction, as a consequence of the actions included in the generic issue associated to the Vandellós II event of degradation of the Essential Service Water System (2004), requesting an analysis by the Spanish nuclear power plants, similar to the one depicted in this GL.

d) RIS 00-003: Periodic verification of design-basis capability of safety related air-operated valves

Following the publication of two US NRC Generic Letters, GL 89-10 and GL-96-05, the study of motor operated valves related to safety systems and their possible failure mechanisms was initiated. Once this phase was completed, a new working group was created for studying air-operated valves related to safety systems. In this occasion the initiative came from the industry, using as reference the documents INPO NX-1018 rev.1 and RIS 00-003. The objective of the study is to identify and evaluate the failure mechanisms of these valves. The identification of the valves to be studied is currently under way.

e) Forsmark NPP (Sweden) Event: Loss of the 400 kV electric systems and failure of the emergency diesel generator

An event of loss of the 400 kV electricity grid followed by the failure of the two emergency diesel generators of the Division I took place at the Swedish Forsmark I NPP, leading to an awkward situation from the point of view of the emergency electrical supply. The CSN determined that the event was generic and has sent a Complementary Technical Instruction to the Spanish plants requesting them to analyse this event and conclude whether they can experience a similar transient. The CSN is waiting for the NPPs' responses to proceed to their assessment.

6.3.4 Plant specific safety improvement programmes

In addition to what has been said above, which is applicable to all plants, there are also improvement programmes and activities specific to each of them. In certain cases the improvement initiative has sprung from the licensee of the plant, although in the majority of cases the improvement itself or its scope has been requested by the CSN.

José Cabrera Nuclear Power Plant

During the commercial operation period of the installation covered by this Report, the risk analyses for the new plant configuration were completed, and a number of activities relating to the last operating years and to the permanent cessation of operations were developed, within the Safety Management Integrated System requested by the CSN in the conditions of the plant's operating permit.

Among the activities carried out through this Safety Management Integrated System stand out, from a technical point of view, those directed to the definition of the safety systems in shutdown, their requirements, etc. and, from a human factors standpoint, those directed to the definition of the organization required after the cessation of operation, the plans for the professional future of the staff, the required training, etc.

The Safety Management Integrated System has been in operation at the José Cabrera NPP since 2003, managing since that time all safety related activities. The change in the plant condition has entailed a reduction of the number of indicators supporting said system from 56 to 13, which is the number of indicators required in the current condition of cessation of operations.

Santa María de Garoña Nuclear Power Plant

As a result of the Periodic Safety Review carried out in 1999, the licensee performed a number of Safety Improvement Programmes that were described in previous national

reports. During the period covered by this report the licensee has continued his policy on plant updating and introduced the following improvements:

- Use of a new Alternate Source Term in the analysis of the radiological consequences of the accidents more in line with their phenomenology.
- Application of a methodology in the thermohydraulic analysis of accidents and transients more in line with their phenomenology.
- Installation of a new system for processing the sludge like solid radioactive waste generated at the Plant.
- Replacement of the speed control system of the recirculation groups.
- Continuation of the dose reduction programme both during normal operation and refuelling outages.
- Continuation of the safety culture programme.
- Continuation of the human factors programme.

The licensee has applied for a new Operating Permit for a 10-year period on 3rd July 2006, in accordance with condition 2 of the Operating Permit in force. Such application is being assessed by the CSN, who will produce a technical report on this matter on May 2009.

The scope of the on-going CSN assessment of the request includes: the Periodic Safety Review performed according to CSN Safety Guide 1.10; the studies justifying the long term operation, consisting of an integrated plan for evaluation and management of plant ageing and a revision of the analyses performed with a defined plant life; and the analyses required by the CSN's Complementary Technical Instruction establishing the conditional application regulations or regulations beyond the License Basis that the licensee must analyse associated to the new operating permit.

Almaraz Nuclear Power Plant

Main improvements incorporated in the period covered by this Report are:

- Final heat sink – Almaraz NPP completed in 2004 the commissioning tests of the new sprinkler system in the essential service water basin.

  This system reduces by 4 ºC, approximately, the temperature of the essential service water basin and consequently the temperature of the Essential Service Water System (ESW), Component Cooling System (CC) and of the ventilation units (HVAC). The final tests carried out on the ESW have shown the suitability of the anticipated results.

  Almaraz NPP, with the proposal presented, achieves a reduction of the temperature of the water in the essential service water basin such that it returns to the original design basis of the ESW, CC and HVAC systems and the basin is validated definitely as the final heat sink

- Implementation of the 5th emergency diesel generator – The CSN agreed, in his plenary meeting of December 2006, to report favourably on the installation and commissioning of a 5th emergency diesel generator and associated gas oil tanks.

Basically, the project consists in the installation of a new diesel generator (5GD), additional to the two of each of the two Almaraz NPP units, which could replace any of the four existing diesel generators and a new gas-oil storage tank of the same capacity as the two existing tanks.

The implementation if the fifth Diesel Generator increases the reliability of the emergency electricity supply to the safeguard buses, since by design it may substitute any

of the existing diesel generators in the same conditions and fulfilling the same requirements. Moreover, it does not affect the other diesel generators performing their safety functions. Finally, it makes possible to improve PSA results decreasing the core frequency damage, facing in better conditions a Station black-out (SBO) and enabling to carry out preventive and corrective maintenance activities during power operation, which will entail shorter refuelling outages and eliminate uncertainties associated to maintenance, making possible to face unexpected situations without affecting plant operation or availability.

Ascó Nuclear Power Plant

Main improvements carried out in the two unit plant have been: replacement of the three phases of the main transformers; replacement of the split pins of the reactor vessel upper internals; installation of a system for zinc addition to the reactor coolant system to minimise stress corrosion effects on the components susceptible to this degradation mechanisms; and the installation of multi-nozzle cavitation venturis in high pressure lines to prevent potential erosion of the manual flow control valves located on these lines in the scenario described in Westinghouse's NSAL 96-01 "Erosion of Globe Valves in ECCS Throttling Applications".

Cofrentes Nuclear Power Plant

By mid 2000, Iberdrola's Nuclear Generation Direction decided to perform a "Self Assessment" of the Cofrentes NPP as a consequence of the number of incidents that happened during the last two refuelling outages, even though they were not relevant for plant safety. The proactive process objective was to learn from the errors made to improve through the application of the Self Assessment results.

In 2004, the CSN continued its tracking and control plan that materialized, basically, in the carrying out of inspections. Through such inspections, as well as through the continued assessment of the operation, the CSN performed both a follow up of the plant response actions (completion of the implementation of the Self Assessment programme initiated after the 13th refuelling outage and other improvement activities) and an analysis of plant operation from a safety point of view (incidences and development of planned operations). With the activities developed throughout 2004, the special monitoring programme was deemed concluded. Plant initiated actions were deemed positive and the contributing factors detected in the 2000 events were not longer present; plant situation, regarding the frequency and characteristics of its operating incidents, was deemed normal.

Another activity carried out by Cofrentes NPP during this period has been a revision and complete compilation of their design bases (RDB). The process has been carried out in phases and, during this period; the revision 5 thereof has been completed based on guide NEI 97-04. The CSN has thoroughly reviewed and inspected this revision and the associated documentation in the period between 2003 and 2006.

Vandellós II NPP

Action Plan for Safety Management Improvement.

The aim of this Plan was to solve, in a three years period following CSN's favourable appreciation, the causes of all organizational and technical problems identified by the licensee actions initiated after the essential service water system incident of 25th August 2004. This Plan included 36 actions of different nature divided into five programmes:

management and leadership, organization, management systems, communication and design improvement, inspections and surveillance.

Ascó–Vandellós Nuclear Association (ANAV), through its General Direction and governing bodies, has assumed the function of giving on impetus, coordinating and supervising the actions related to safety management, which, during the three years period spanning from the CSN´s acceptance of the Plan to mid 2008, will mainly focus on the Action Plan activities. Therefore, the licensee has set as objective for this period the implementation of all actions included in the aforesaid Plan and the verification of the effectiveness thereof, by establishing the necessary supervision mechanisms to ensure an adequate level in the safety management of the Plant.

The licensee, at the request of the CSN, included the supervision and self-assessment processes in its *Action Plan for Safety Management Improvement* as mechanisms to measure Plan effectiveness in relation to the organization progress on the improvement of the Plant safety management.

Supervision elements were the external evaluations by international Groups or Organizations such as the International Atomic Energy Agency (IAEA) and a group of international experts set up by the OECD Nuclear Energy Agency at the request of the CSN, which elaborated the recommendations on which the Action Plan was basically prepared. The Plan supervision elements have been complemented with a performance indicator system enabling the licensee to perform an adequate monitoring of the evolution of the actions thereof.

The *Management and Leadership* programme's aim is to establish an organization Management capable of motivating the staff in safety management matters. For that purpose, the licensee, through its General Direction, is emphasizing on new personnel behaviours and on new models for evaluating personnel performance of the activities, as the two basic starting points to achieve the improvement of safety management.

The *Organization* programme has led the licensee to carry out an organizational restructuring in order to consolidate the solution of the organizational deficiencies identified by the essential service water system incident and other relevant situations, consisting in a change of the structure and reassignment of the functions and responsibilities of important organizational units, such as: ANAV's governing bodies; the General Direction; the advisory bodies such as the organization safety committees; some important departments including engineering, maintenance and quality.

The *Management Systems* programme provides the licensees with tools and means to strengthen the management systems established in the organization and, at the same, time create new ones to ensure an adequate treatment of the safety within the operating activities. Some means or tools are far-reaching, like the programme to achieve an adequate acceptance of the safety culture by ANAV or the prioritisation of design modifications based on safety criteria instead of the previous criteria, or the Corrective Actions Programme (PAC).

Within the scope of the *Communication* programme, the licensee has set up an internal communication programme, based on the strategic lines of the new ANAV Management, aimed at re-establishing an adequate level of internal communication in ANAV and of interrelation among the departments as means to ensure an adequate performance of their functions by the whole staff. An important milestone in the communication programme is the improvement of the process of notification and communication of incidents and anomalies.

Finally, the most important activities included in the *Systems' Design, Inspection and Monitoring Improvements* programme are the actions devoted to solve the problems of the essential

service water system (EF) and of the systems cooled by EF: component cooling water system (EG), essential cooled water system (GJ) and emergency diesel motor cooling system (KJ).

Licensee's final solution contemplates the implementation of a new safety class, double train (double piping, double equipment) essential service water system (EJ) that will replace the existing system. Each train will include a forced draft cooling tower and a fresh water basin with enough capacity as to permit the operation of the system time enough to cope with the most unfavourable Plant operating conditions considered in the licensing basis. This system will dissipate the removed heat into the atmosphere instead of going into the sea, as it is the case with the existing essential service water system. The new system design, developed according to the described solution, will permit to declassify the current system as safety-class.

Trillo NPP

During the period covered by this Report, the programme of maintenance during power operation has continued. This programme, initiated by the licensee on its own and assessed by the CSN, includes an in-depth revision of the emergency and safeguards diesel generators and other supported systems. The redundancies of the plant systems enable to perform these activities while operating at power and to improve the availability of internal and external resources for these activities and the refuelling ones.

In 2005, the licensee has initiated a programme for replacing the 24/48 and 220 V.c.c. emergency and safeguard batteries. The batteries of one emergency redundancy have been replaced in the 2005 refuelling outage and other in the 2006 refuelling outage.

In 2004, the titular voluntarily started a programme for motor operated valves improvement that includes the motor operated globe valves of several systems. In accordance with this programme, which will last until 2009, the actuator power and the valve construction itself are adapted to the operating conditions resulting from postulated failure mechanisms additional to those contemplated in the original design.

6.4 Generic evaluation of continued operation based on the safety level of the Spanish nuclear power plants

The Spanish nuclear power plants are subjected to a continuous safety review process that translates into the establishment of specific programmes aimed at improving safety in different areas. In addition, a Periodic Safety Review is carried out once every ten years.

The generic assessment of the level of safety of the Spanish nuclear power plants is based on the following aspects:

- Compliance with standards and regulations. The Spanish plants comply with the design standards of the country of origin of their technology in force at the time of their construction and the current Spanish regulations.
- During the 1980's the first generation plants, José Cabrera and Santa María de Garoña, carried out a Systematic Evaluation Programme, as a result of which they experienced a number of safety improvements, as detailed in section 1 of Article 6 of the First Spanish National Report on the Convention on Nuclear Safety.
- All nuclear power plants are required to analyse the new standards generated in the country of origin of their technologies, which are the USA for most of the plants and

Germany in the case of Trillo NPP, and to take whatever actions might be applicable to them.

- The Periodic Safety Reviews led to the implementation of new improvement programmes, as indicated in section 6.3.
- All Spanish nuclear power plants have carried out specific PSA's, which have been evaluated by the CSN. Chapter 14.3 shows the status of the PSA studies for each plant, Level 1 for on-site events, off-site events, fires, Level 2, etc.
- The safety levels achieved adequately meet the requirements established in this article. Consequently, it is considered that there is no urgent need for new safety evaluations or modifications for safety reasons.

The Spanish nuclear power plants in operation are subjected to supervision and control process known as Integrated Plant Surveillance System (SISC) based on performance indicators and inspection findings the results of which are categorized as a function of their safety relevance and entail regulatory actions. A more detailed description of the SISC is included in section 7.3 of this Report.

6.5 Degree of compliance with the obligations of the Convention

In view of the levels of safety achieved as a result of the analyses and modifications performed, jointly with the continuous review process to which the Spanish nuclear power plants are subjected, these plants are considered to adequately fulfil the requirements of this article. Consequently, it is considered that there is no urgent need for new safety evaluations or modifications for safety reasons.

APPENDIX 6.A

Basic characteristics of the Spanish nuclear power plants

	Almaraz	Ascó	Vandellós II	Trillo	Garoña	Cofrentes
Type	PWR	PWR	PWR	PWR	BWR	BWR
Thermal power (MW)	U-I: 2.739 U-II: 2.739	U-I: 2.950,6 U-II: 2.950,6	2.940,6	3.010	1.381	3.237
Electrical power (MW)	U-I: 977 U-II: 980	U-I: 1.032,5 U-II: 1.027,2	1.087,1	1.066	466	1.092,02
Cooling	Open Arrocampo reservoir	Mixed Ebro river Cooling towers	Open Mediterranean sea	Closed cooling towers Tajo river make up	Open Ebro river	Closed cooling tower Júcar river make up
Number units	2	2	1	1	1	1
Preliminary authorisation Unit I/II	29-10-71 23-05-72	21-04-72 21-04-72	27-02-76	04-09-75	08-08-63	13-11-72
Construction permit Unit I/II	02-07-73 02-07-73	16-05-74 07-03-75	29-12-80	17-08-79	02-05-66	09-09-75
Start up permit Unit I/II	10-13-80 15-06-83	22-07-82 22-04-85	17-08-87	04-12-87	30-10-70	23-07-84
Latest operating permit	08-06-00	02-10-01	26-07-00	16-11-04	05-07-99	20-03-01
Year of saturation of fuel pools. Unit I/II	2021 2022	2013 2015	2020	2043 (*)	2015	2009

* Availability of cask dry storage facility for irradiated fuel

b) Legislation and regulation

Article 7. Legal and regulatory framework

7.1 Main modifications to the legal framework

Included in this section are references to the novelties that have occurred on the legislative and regulatory framework during the period covered by this Fourth National Report on the Convention on Nuclear Safety.

7.1.1 Law on the Consejo de Seguridad Nuclear (Nuclear Safety Council)

It must be stated that recently the Spanish Parliament has debated the modification of the Law creating the Nuclear Safety Council that reforms the Law 15/1980. The main modification priority is to update the operation of the Nuclear Safety Council (CSN) after the time elapsed since its creation, and for this purpose contemplates certain organizational and functional changes, incorporating mechanisms to improve the transparency in the processes of communication and information to the general public, as well as regulating procedures that enable workers of nuclear facilities to report safety failures and deficiencies to the CSN.

Also, once the Law will be approved, reforms will be made on the Law 25/1964, Nuclear Energy Act, related to updating the infraction and sanction system on nuclear matters, contemplating a better description of behaviours and an increase of the economic fines to be imposed, besides revising technical questions (typology of nuclear installations) that due to the scientific research situation required to be updated.

7.1.2 Legal standards

- Law 24/2005, of 18th November, on reforms to boost productivity, modifies the Law 25/1964, Nuclear Energy Act and the Law 15/1980, creating the Nuclear Safety Council.
  - The purpose of the modifications is to state explicitly different administrative aspects relating to the participation of the Regional Administrations (Autonomous Communities) in the authorisation procedures for nuclear and radioactive facilities that are competence of the State (Ministry of Industry, Tourism and Trade, after receiving the binding report of the CSN). In this sense, it is required that they participate and are heard in such procedures from the standpoint of their competence on matters of "land use planning and environmental regulation".
  - It is also stated that the authorisation procedures applicable to each phase in the life of such nuclear and radioactive installations will be regulated by means of specific regulatory rules, without reaching the Law level.
  - In addition to its function of mandatory reporting on all authorisations, the Nuclear Safety Council has the function of performing surveillance of nuclear and radioactive facilities in each of the phases throughout their lifetime, among them: site selection, construction, commissioning, operation and the dismantling and decommissioning, in

order to have a responsible Authority even after the operation has ended or the facility has been decommissioned.

– Also a binding (mandatory) character is expressly given to the Instructions of the Nuclear Safety Council as technical standards approved in Plenary Meetings of the CSN, in matters of its competence.

- The Law 27/2006, of 18th July, regulating the rights of access to information, public participation and access to justice on environmental matters.

  – The law includes the commitments agreed at the Aarhus Convention (25th June 1998), ratified by Spain on December 2004, referring to the rights of the citizens to have access to the documents of the public Administrations on environmental matters.

  – In addition, the Law incorporates the directives 2003/4/EC and 2003/35/EC on public information, participation and access to justice on environmental matters.

  – Among its more important characteristics, the Law broadens the obligations of the public Authorities for issuing, on its behalf, relevant information on environmental matters as well as answering requests of concerned people, understanding the term "concerned" in a very broad sense, establishing the need to restrictively interpret the reasons for denial of the requested information.

  – It substitutes the law 38/1995, of 12th December, on the right of access to information on environmental matters and makes modifications on the regulations on environmental impact evaluation, establishing, among others, the obligation of the Government to approve a combined legal text regularizing, clarifying and harmonizing the legal provisions in force on environmental impact evaluation matters.

7.1.3 Regulatory standards and other binding administrative acts

A set of regulations have been approved developing the Government directives on nuclear emergency planning matters, regulating the competences of the different authorities in such situations:

- Royal Decree 1546/2004, of 25th June, approving the Nuclear Emergency Basic Plan (PLaben).

  – The Nuclear Emergency Basic Plan (Plaben) is the guiding document containing the regulations and essential criteria for the preparation, effective material implementation, and maintenance of the effectiveness of the nuclear emergency plans for civil protection outside the nuclear power plants, the competence of which corresponds to the State General Administration, with the support of all other Public Administrations.

  – This updating of the existing regulations on this matter emerge from the progressive adoption of responsibilities by the Autonomous Communities, the issuing of Directives that have been incorporated into the Spanish legal system that affect these matters and, finally, from the experience acquired during the use of the previous nuclear emergency plans.

- Order INT/1695/2005, of 27th May, of the Ministry of the Interior approving the Nuclear Emergency Plan for the Response and Support National Level (Pencra)

  – The purpose of this order is to establish coordinated action mechanisms of the "Response and Support National Level" organization according to that determined in the Plaben.

– The intention is to address situations of high collective risk, catastrophes or public calamities that may arise from accidents in operating nuclear power plants or after they have been shutdown while storing spent nuclear fuel.

- Resolution of 14th June 2006 of the Under-secretariat of the Ministry of the Interior, providing for the publication of the Agreement of the Council of Ministers, of 9th June 2006, approving the Master Plans related to the Nuclear Emergency Plans outside the nuclear power plants.
  - Plaben establishes in its first additional provision that the master plans will be approved by the Council of Ministers.
  - By this Resolution, the different plans that will govern the nuclear power plants are published.

In this period, the CSN has approved several Instructions by virtue of the legal authorization granted to this Organization in article 2 a) of the Law 15/1980, of 22th April, which have a binding(*) character and are addressed to a general or undetermined recipient, with the aim of regulating technical questions relating to its competences on nuclear safety and radiation protection matters.

From the standpoint of its position in the Regulatory pyramid, the legal value of this type of rules is the same as that of a Government regulation, with a sectorial scope, enabling imposition of obligations and regulations to whomever deals with matters that are competence of the CSN (nuclear safety and radiation protection), but such obligations can not be in contradiction with the Government regulations (Royal Decrees, Ministerial Orders) which have a broader spectrum

In short, they are permanent rules integrated to the legal system, which can be revised in court through contentious administrative proceedings as any other administrative regulation.

Failure to comply with them is legally typified as administrative infraction and is punishable accordingly.

The Instructions issued by the CSN in this period are the following:

- Instruction IS-08, of 27th July 2005, of the Nuclear Safety Council, on the criteria applied by the Spanish Safety Council to request specific advise on radiation protection from the owners of the nuclear and radioactive facilities
- Instruction IS-09, of 14th June 2006, of the Nuclear Safety Council, establishing the criteria to be fulfilled by the systems, services and procedures for physical protection of nuclear facilities and materials.
- Instruction IS-10, of 25th July 2006, of the Nuclear Safety Council, establishing the criteria for reporting events to the Nuclear Safety Council by the nuclear power plants.
- Instruction IS-11, of 21th February 2007, of the Nuclear Safety Council, on licenses for the operating personnel of the nuclear power plants.
- Instruction IS-12, of February 28th, of the Nuclear Safety Council, on training of non-licensed personnel of the nuclear power plants.
- Instruction IS-13, of March 21th, 2007, of the Nuclear Safety Council, on radiological criteria for the release of Nuclear Power Plant sites.

* This characteristic, which defines them as legally binding regulations for its target recipients, was followed in the administrative practice of the CSN but up to now was never reflected explicitly in a legal provision.

7.1.4 Main issues addressed by the CSN guides published during the period

The Nuclear Safety Council Guides are documents containing recommendations, unless a standard provides them with a coercitive nature. The objective of the Guides is to achieve better compliance with the regulatory requirements and precepts by orienting the administrated party towards the most adequate decision-making, rather than through imposition.

The new issues addressed by the Nuclear Safety Council guides published during the period corresponding to this Report refer to refuelling activities in light water nuclear power plants, emergency drills, technical-administrative requirements for personnel dosimetry services, actions to be taken in the case of persons that have suffered a radiological accident, or a manual for dose calculation outside the nuclear power plants, the titles of which are included below in the list of guides published during the period covered by this report. The remaining issues dealt with in other guides were already in the previous report but stating that at the time they were in the preparation phase or in print. Appendix 7.B includes a list of all the CSN safety guides, reflecting their status.

- Section 1: Power reactors and nuclear power plants
  - GS-1.05. Documentation on refuelling activities at light water reactor nuclear power plants. 1990. (Rev. 1, July 2004).
  - GS-1.09. Emergency drills and exercises at nuclear power plants. 1996 (Rev. 1, March 2006).
- Section 4: Environmental radiation monitoring
  - GS-4.02 Site restoration plan, 2007
- Section 7: Radiation Protection
  - GS-7.01. Technical-administrative requirements for personal dosimetry services. 1985. (Rev. 1, May 2006).
  - GS-7.05. Actions to be implemented in the case of persons affected by radiological accidents. 1989. (Rev. 1, May 2005).
  - GS-7.09. Manual for dose calculation outside nuclear power plants. April 2006.

As well as developing Instructions and safety guides, it is worthwhile to mention, in relation to the regulatory aspects, the work performed inside the CSN for technical revision both the Nuclear Energy Act and the Regulation Governing Nuclear and Radioactive Facilities, which has been transferred to the Ministry of Industry, Tourism and Trade for their processing.

7.2 Degree of compliance with the obligations of the Convention

Fulfilling the legislative and regulatory modifications accomplished during the period covered by the previous report, it may be said that Spain has improved its degree of compliance with the requirements of this article in relation to the establishment and maintenance of a legal framework applicable to nuclear facilities.

Appendix 7.A

CSN Instructions published up to June 2007

- Instruction IS-01, of 31th May 2001, of the Nuclear Safety Council, defining the format and contents of the individual document for radiation monitoring (radiation passbook) regulated by the Royal Decree 413/997 (Official State Gazette - BOE, 6th August 2001).
- Instruction IS-02, revision 1, of the Nuclear Safety Council on documentation relating to refuelling activities at light water nuclear power plants (BOE, 16th September 2004).
- Instruction IS-03 of 6th November 2002, of the Nuclear Safety Council, on the qualifications required to obtain recognition as an expert on protection against ionising radiations (BOE, 12th December 2002.
- Instruction IS-04, of 5th February 2003, of the Nuclear Safety Council, regulating the transfer, filing and custody of the documents corresponding to the radiation protection of the workers, the general public and the environment prior to the transfer of ownership of the operations of the nuclear power plant for dismantling and decommissioning (BOE, 28th February 2003)
- Instruction IS-05, of 26th February 2003, of the Nuclear Safety Council, defining the values of exemption for nuclides, as established in tables A and B of annex I of Royal Decree 1836/1999 (BOE, 10th April 2003).
- Instruction IS-06, of 9th April 2003, of the Nuclear Safety Council, defining training programmes on basic and specific radiation protection matters, regulated by Royal Decree 413/1997, of 21th March, in relation to nuclear and radioactive facilities of the fuel cycle (BOE, 3th June 2003) On 28th October 2004, the CSN sent an information circular to all external companies clarifying some aspects for the practical application of this instruction.
- Instruction IS-07, of 22th June 2005, of the Nuclear Safety Council, on fields for application of the radioactive installations personnel licenses (BOE, 20th July 2005)
- Instruction IS-08, of 27th July 2005, of the Nuclear Safety Council, on the criteria applied by the Nuclear Safety Council to request specific advise on radiation protection from the owners of the nuclear and radioactive installations (BOE, 5th October 2005).
- Instruction IS-09, of June 14th, 2006, of the Nuclear Safety Council, establishing the criteria to be applied for the systems, services and procedures of physical protection for nuclear facilities and materials (BOE, 7th July 2006).
- Instruction IS-10, of July 25th, 2006, of the Nuclear Safety Council, establishing the criteria for reporting events to the Nuclear Safety Council by the nuclear power plants (BOE, 3th November 2006).
- Instruction IS-11, of 21th February 2007, of the Nuclear Safety Council, on licenses for the operating personnel of the nuclear power plants (BOE, 26th April 2007).
- Instruction IS-12, of 28th February 2007, of the Nuclear Safety Council, on training of non-licensed personnel of nuclear power plants (BOE, 11th May 2007).
- Instruction IS-13, of 21th March 2007, of the Nuclear Safety Council, on radiological criteria for the release of Nuclear Power Plant sites (BOE, 7th May 2007).

Appendix 7.B

CSN Safety Guides published up to 2007

- GS-1.01. Qualifications for the acquisition and use of nuclear power plant operating personnel licences. CSN, 1986
- GS-1.02. Nuclear emergency dosimetry model. CSN, 1990.
- GS-1.03. Nuclear power plant emergency plan. CSN, 1987. Rev. 1, 2007.
- GS-1.04. Radiological control and surveillance of liquid and gaseous radioactive effluents released by nuclear power plants. CSN, 1988.
- GS-1.05. Documentation on refuelling activities at light water reactor nuclear power plants. CSN, 1990. Rev. 1, 2004.
- GS-1.06. Reportable events at operating nuclear power plants. CSN, 1990.
- GS-1.07. Information on nuclear power plant operation to be submitted to the CSN by the licensees. CSN, 1997.
- GS-1.09. Emergency drills and exercises at nuclear power plants. CSN, 1996 (Rev. 1, 2006).
- GS-1.10. Periodic Safety Reviews at nuclear power plants. CSN, 1996.
- GS-1.11. Design modifications at nuclear power plants. CSN, 2002.
- GS-1.12. Practical application of the optimisation of radiation protection in nuclear power plant operation. CSN, 1999.
- GS-1.13. Contents of nuclear power plant operating regulations. CSN, 2000.
- GS-1.14. Criteria for performance of Probabilistic Safety Assessmets applications. CSN, 2001.
- GS-1.15. Probabilistic Safety Analysis updating and maintenance. CSN, 2004.
- GS-4.01. Design and development of the Environmental Radiological Surveillance programme for nuclear power plants. CSN, 1993.
- GS-4.02. Site restoration plan. CSN, 2007.
- GS-5.01. Technical documentation to requests for construction and star-up permits for facilities handling and storing non-encapsulated radioactive isotopes (2nd and 3rd category). CSN, 1986. Rev. 1, 2005.
- GS-5.02. Technical documentation to requests for the construction and star-up permits for facilities handling and storing encapsulated sources (2nd and 3rd category). CSN, 1986. Rev. 1, 2005.
- GS-5.03. Control of the hermetic sealing of encapsulated radioactive sources. CSN, 1987.
- GS-5.05. Technical documentation for requests for construction and star-up permits for radiotherapy facilities. CSN, 1988.
- GS-5.06. Qualifications for the acquisition and use of radioactive facility operating personnel licenses. CSN, 1988.
- GS-5.08. Basis for the preparation of information relating to the operation of radioactive facilities. CSN, 1988.
- GS-5.09. Documentation for requests for the authorisation and entry of X-ray equipment sales and technical assistance companies. CSN, 1998.
- GS-5.10. Technical documentation for requests for authorisation of X-ray facilities for industrial purposes. CSN, 1988. Rev.1, 2005.
- GS-5.11. Technical aspects of safety and radiation protection at X-ray facilities for medical diagnosis. CSN, 1990.

- GS-5.12. Homologation of training courses for supervisors and operators of radioactive facilities. CSN, 1998.
- GS-5.14. Safety and radiation protection at industrial gammagraphy radioactive facilities. CSN, 1999.
- GS-5.15. Technical documentation for the request of type approval for radioactive apparatus. CSN, 2001.
- GS-5.16. Technical documentation for the request of operating permits for radioactive facilities containing industrial process control equipment. CSN, 2001.
- GS-6.01. Quality assurance in the transport of radioactive substances. CSN, 2002.
- GS-6.02. Radiation protection programme applicable to the transport of radioactive substances. CSN, 2003.
- GS-6.03. Instructions on emergencies in the transport of radioactive substances. CSN, 2004.
- GS-6.04. Documentation for requests for authorisation for the transport of radioactive substances: package approvals and authorisation of the shipment. CSN, 2006.
- GS-7.01. Technical-administrative requirements for individual personal dosimetry services. CSN, 1985. Rev. 1, 2006.
- GS-7.03. Bases for the establishment of services or technical units for protection against Ionising Radiations. CSN, 1987. Rev. 1, 1998.
- GS-7.05. Actions to be implemented in the case of persons affected by radiological accidents. CSN, 1989. Rev. 1, 2005.
- GS-7.06. Contents of radiation protection manuals for nuclear facilities and radioactive facilities pertaining to the nuclear fuel cycle. CSN, 1992.
- GS-7.07. Radiological control of drinking water. CSN, 1990. Rev.1, 1994.
- GS-7.09. Manual for dose calculation outside nuclear power plants. CSN, 2006.
- GS-8.01. Physical protection of nuclear materials at nuclear and radioactive facilities. CSN, 2000.
- GS-9.01. Control of the low and intermediate level radioactive waste solidification process. CSN, 1991.
- GS-9.02. Management of solid radioactive waste materials generated at radioactive facilities. CSN, 2001.
- GS-10.01. Basic guide on quality assurance at nuclear facilities. CSN, 1985. Rev. 2, 1999.
- GS-10.02. System of documentation subject to quality assurance programmes at nuclear facilities. CSN, 1986. Rev.1, 2002.
- GS-10.03. Quality assurance audits. CSN, 1986. Rev. 1, 2002.
- GS-10.04. Quality assurance for the star-up of nuclear facilities. CSN, 1987.
- GS-10.05. Quality assurance for processes, testing and inspections at nuclear facilities. CSN, 1987. Rev. 1, 1999.
- GS-10.06. Quality assurance in the design of nuclear power plants. CSN, 1987. Rev. 1, 2002.
- GS-10.07. Quality assurance at operating nuclear facilities. CSN, 1988. Rev. 1, 2000.
- GS-10.08. Quality assurance for the management of elements and services for nuclear facilities. CSN, 1988. Rev. 1, 2001.

- GS-10.09. Quality assurance for computer applications relating to the safety of nuclear facilities. CSN, 1998.
- GS-10.10. Qualification and certification of personnel performing non-destructive test. CSN, 2000.
- GS-10.11. Quality assurance for first category radioactive facilities. CSN, 2001.
- GS-10.12. Radiological control of scrap recovery and recycling activities. CSN, 2003.
- GS-10.13. Quality assurance for the dismantling and decommissioning of nuclear facilities. CSN, 2003.

Article 8. Regulatory body

In Spain, several authorities carry out the regulatory function as regards nuclear safety and radiation protection.

The Government is in charge of energy policy as well as of announcing mandatory statutory regulations.

The Ministry of Industry, Tourism and Trade is the Department of the State's Central Administration competent with regard to nuclear power; its responsibility is to grant the different licenses relating to nuclear facilities, subject to the preceptive and binding reports of the Nuclear Safety Council and, as the case may be, of other Ministerial departments, as well as to submit regulatory proposals, to adopt provisions in the development of current regulations, and apply the disciplinary system as regards nuclear energy.

The Nuclear Safety Council is they only body of the State competent as regards nuclear safety and radiation protection, it being a Public Law Body independent from the Government and reports to the Parliament on the development of its activities and interacts with the Government via the Ministry of Industry, Tourism and Trade.

8.1 Functions and responsibilities of the MITYC

The Ministry of Industry, Tourism and Trade (MITYC), in accordance with Royal Decree 1554/2004, carries out the following functions within the scope of the Convention on Nuclear Safety:

- Granting of licenses for nuclear facilities and radioactive facilities[(1)], following a preceptive and binding report by the CSN.
- Preparation of regulatory proposals and application of the disciplinary system.
- Contribution to the definition of the R&D policy.
- Monitoring of the compliance with the international agreements signed by Spain in the framework of nuclear energy, in particular as regards non-proliferation and civil liability due to nuclear damages.
- Relations with the International Organizations specialised in the subject.

In accordance with that established in Royal Decree 1554/2004, of June 25th, the CSN interacts with the Government via the MITYC.

8.1.1. Organisational Structure

The structure of the MITYC was set up by Royal Decree 562/2004, of 19th April. Within the MITYC, the General Secretariat of Energy is the top body as regards energy; within it, the Directorate General for Energy Policy and Mines, of which the Subdirectorate General for Nuclear Energy depends, is the governing body that carries out the functions referred to in the previous section specifically applicable to the framework of nuclear energy.

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1. Except for second- and third-category radioactive facilities located in the territory of Autonomous Communities which the administrative functions on this matter have been transferred to..

8.1.2. Coordination of Nuclear R&D Activities

The MITYC, through the Subdirectorate General for Nuclear Energy, takes part in the coordination of some of the research, development and innovation activities in the framework of nuclear energy in Spain.

8.1.3. Participation in International Organisations and Activities

The MITYC, through the Subdirectorate General for Nuclear Energy, actively takes part in the activities as regards nuclear power promoted by the International Organisations to which Spain belongs.

Lastly, the MITYC collaborates in reaching bilateral agreements with other countries in the scope of the peaceful uses of nuclear energy and represents the Spanish Government at the Meetings of Contributors of diverse International Funds, of which Spain is a contributor.

Within the scope of the European Union, the MITYC advises the Permanent Representation of Spain for its involvement in the Council's working groups that deal with issues regulated by the EURATOM Treaty.

Within the framework of the International Atomic Energy Agency, the MITYC belongs to the Spanish Delegation before the Agency's General Conference.

The MITYC belongs to the Spanish Delegation during the Steering Committee of the OECD's Nuclear Power Agency.

8.2. Functions and Responsibilities of the CSN

The Nuclear Safety Council is a Public Body, with its own legal personality and assets, which is independent of the Government, and it is the organisation solely responsible in Spain for nuclear safety and radiation protection.

Its main functions, in connection with nuclear and radioactive facilities and related activities, are the following:

- To propose to the Government the necessary regulations in the sphere of competition, and to approve technical Standards, Instructions, Guides and Circulars on said subject.
- To issue preceptive reports for the Ministry of Industry, Tourism and Trade so that the latter rules on the grating of the legally established permits; said reports will be binding in case they are negative and when they impose necessary safety conditions.
- To conduct the control and inspection of all facilities, in all their phases, in particular, during their design, construction, start-up and operation.
- In this sense, the CSN has the authority to cease the operation of the activities and facilities for safety reasons.
- To collaborate with the proper authorities in preparing the off-site emergency plans of the nuclear and radioactive facilities and to coordinate the measures for supporting and responding to emergency situations.
- To propose the opening of disciplinary proceedings in case of infractions as regards nuclear safety and radiation protection, in accordance with the current legislation, as well as to issue technical reports for the proper description of the facts, even though the sanctions will be imposed by the proper Authorities, the Government or the Territorial Administrations, and also to warn licensees and propose corrective measures and, where appropriate, to impose coercive to the fines.

- As regards environmental radiation protection, the CSN controls and monitors radiological quality throughout the Spanish territory, and not only in the areas surrounding the facilities. At the instance of the Congress of Deputies, work is being done on an epidemiological study to research the effect of exposure to radiations derived from the fuel cycle operation of nuclear and radioactive facilities.
- In emergency situations, the CSN coordinates whatever resources might be required for compliance with those functions for which it is responsible.
- The CSN approves technical standards and has the powers to issue favourable reports on of new designs and methodologies.

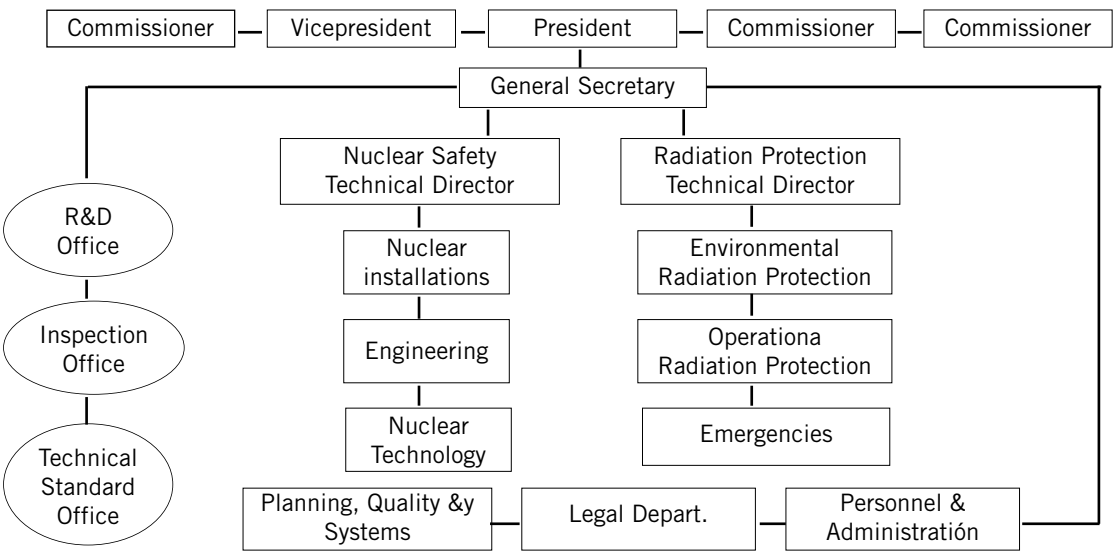
In short, the CSN's functions and responsibilities have not been substantially modified with regard to the previous Report, and work is still being done according to the legislative changes occurred in the last few years. As indicated in the Third National Report on Nuclear and Radioactive Facilities, the CSN unified the general contents of the licenses and harmonised their provisions with other general regulations. A serie of functions for the CSN emerge from said Regulations, such as the participation in the Information Committees, which comprise representatives of the Government, the appropriate Autonomous Community, the municipal areas in which the plants are located, and the plants themselves. The function of these committees is to inform different organisations about the execution of the activities regulated.

The transparency in the CSN's management and the decisions it makes is achieved upon making the reports that support them, as well as the inspection reports, public. The results from the Integrated Plant Supervision System are also made public. Furthermore, a procedure for public information was set up, prior to the publication of the CSN's regulatory documents.

Finally, the significance of the mission of the Integrated Review of Nuclear Regulations (IRRS), which Spain requested the International Atomic Energy Agency to start next year, 2008, and which previously has laid the foundations for defining the action plan by means of the self-assessment of all the body's processes, must be pointed out.

8.2.1. Structure of the CSN

The current organic structure of the CSN is the following (Figure 8.1):



Units reporting directly to the Secretariat General

In addition to the two technical directorates, three Subdirectorates General and three Offices report to the Secretariat General:

- Subdirectorate General for Planning, Information Systems and Quality.
- Subdirectorate General for Personnel and Administration.
- Subdirectorate General for Legal Affairs.
- Inspection Office.
- R&D Office.
- Technical Standards Office.

Technical Directorate for Nuclear Safety

All functions relating to safety of nuclear facilities are grouped under this Technical Directorate, except the disposal of low- and intermediate-level radioactive wastes, which is the responsability of the Technical Directorate for Radiation Protection. The Directorate also responsible of functions relating to safety in the transport of nuclear substances and radioactive materials.

This grouping of areas of competence under a single, highly specialised management centre allows the inspection, regulatory efficiency and control of nuclear facilities to be optimised.

Three Subdirectorates General report to the Technical Directorate for Nuclear Safety:

- Subdirectorate General of Nuclear Facilities.
- Subdirectorate General of Nuclear Technology.
- Subdirectorate General of Engineering.

Technical Directorate for Radiation Protection

In addition to the inspection and control of radioactive facilities, the radiation protection of workers and the management of low and intermediate level radioactive wastes, this Technical Directorate assumes the competences with regard to the radiation protection of the public and the environment and to radiological emergencies.

Three Subdirectorates General report to the Technical Directorate for Radiation Protection:

- Subdirectorate General of Environmental Radiation protection
- Subdirectorate General of Operational Radiation protection
- Subdirectorate General of Emergencies

In accordance with the Law of Creation of the Nuclear Safety Council and its statute, the President of the Body and three of its board members were confirmed for another term on December 2006. The confirmation of the Secretary General for another term took place on March 2007.

The Plenary Meeting of the new Council approved the establishment of the following new Commissions:

- Strategic Planning Commission
- Regulation Commission

- Institutional and International Relations and Communication Commission
- Economic System and Human Resources Commission
- Training and R&D Commission

8.2.2. Review of the Strategic Orientation Plan

On 2006, the Spanish Government, through its Permanent Representation and at the instance of the Nuclear Safety Council, requested the IAEA the carrying out of a Mission of an International Group for the Review of the Regulatory Situation (IRRS) so that the situation of the legal and regulatory framework of nuclear power in Spain, as well as the structure, operation, and practices of the bodies with authority – with particular emphasis on the CSN's functions given that it is the only competent body regarding nuclear safety and radiation protection – be reviewed with reference to the Body's regulations and guidelines.

The CSN devised and approved a Strategic Plan, which covers the 2005-2010 period. Said Plan sets forth the Body's Mission and Vision, summarises the analyses of the surroundings conducted so as to devise the Plan, and establishes the results expected from the organisation. Likewise, it describes the strategies established (Safety and Protection, Management and Organisation, and Social Credibility) and the objectives associated therewith. Lastly, it includes the most significant activities out of those that will be carried out in order to achieve the objectives.

In order to properly prepare the mission, the CSN started at the end of 2005 a self-assessment that took as reference questionnaire IAEA-TECDOC-703, Ed. 1993, Part II, and the requirement documents published by the IAEA. This self-assessment was performed by several "diagnostic groups", made up of staff from the CSN.

In May 2006, the CSN's Plenary Meeting approved the final assessment report and subsequently the action plan which identifies the actions to be carried out in order to meet the requirements of the IRRS mission. Once said action plan was approved, an analysis was carried out aimed at defining the initial actions to be undertaken, which allowed those processes of more significance for both the CSN's strategy and the IRSS mission to be identified.

The list of processes under way together with an estimation of the hours necessary for completing the actions to be undertaken, as well as the number of actions started in 2006, are included in Table 8.1. The current action plan includes the year 2009, and it has been integrated in the annual planning.

In February 2007, an IRRS mission preparatory meeting was held with representatives of the IAEA. Said meeting has served to define the final programme for performing the IRRS mission and consolidating the approved Action Plan.

8.2.3. CSN Internal Quality Plan

Since 2001, the CSN has been dedicating an average number of 8,500 hours per year to internal quality, which amounts to 1.5 % of the available hours.

As of 16th April 2007, there are 146 procedures approved: there are 28 management related, 25 administrative, and 92 technical procedures. The list of these procedures is included in Appendix 8.A. A Procedure programme has been devised based on document "Acciones Iniciales del Plan de Acción IRRS" (Initial Actions of the IRRS Action Plan).

Table 8.1. IRRS Actions

Projects	Responsible units	Hours	Actions started before 31/12/06
Regulations	DSN/DPR	2.960	9
Communication	SG/GTP	1.250	11
Management System	SG/SIC	7.310	16
Regulatory process of Nuclear Facilities and the fuel cycle	DSN	5.140	12
Inspection	OFIN/ DSN/DPR	5.200	7
Waste	DSN/DPR	4.250	4
Security	DPR	3.680	8
Institutional and International Relations	SG/GTP	1.430	10
Human Resources	SG/GBSG	5.550	0
Regulatory process of radioactive facilities and related entities (includes transportation and service entities)	DPR	2.360	8
Worker Radiological Surveillance and Control	DPR	630	0
Radiological surveillance and control not associated with facilities	DPR	4.380	3
Emergency Management	DPR	3.900	9
Personnel Training and Licensing	DSN / DPR	520	3
Total		48.560	100

DSN and DPR indicate the Technical Directorates for Nuclear Safety and Radiation Protection respectively. SG: General Secretariat. GTP: Technical Office of the Presidency. GBSG: Office of the General Secretariat. OFIN: Inspection Office. And SIC: Subdirectorate General for Planning, Information Systems and Quality

As a result of the preparation of the IRRS mission, the CSN's Management System update project, in which the Quality Manual review is included, has been started; a consulting firm was hired at the end of October 2006 for this purpose. The actions performed are the following:

- Analysis of the current situation
- Devising of the Work Plan
- Update of the Process Map
- First edition of the descriptive records of all processes
- The drafting of the Management Manual has been started, and a methodology proposal for managing indicators of the control panel is available

8.2.4. Review of the CSN financing/CSN's resources and personnel

The revenue and expenditure budgets are integrated in the General State Budget, and is subject to approval by Parliament.

The budget approved for the 2007 financial year amounts to 43,823.95 euros.

According to the nature of the revenue, the two most important budget items of the revenue budget for 2007 are:

Fees, General State Budget, Public Tariffs

Economic resources are mainly obtained by the collection of fees and public tariffs corresponding the provision of the services that it renders in pursuance of its functions. The conditions are regulated in Law 14/1999, of 4th May, on Fees and Public Tariffs for services rendered by the Nuclear Safety Council. Depending on the functions it performs, there are different financing methods. Currently there are the following:

Financed through fees:

- Performance out of studies, issuing of reports, and inspections previous to the authorisation of nuclear and radioactive facilities granted by the Ministry of Industry, Tourism and Trade.
- Inspection and control of nuclear and radioactive facilities and related activities.
- Granting of licenses to the personnel in charge of operating and supervising the operation of nuclear and radioactive facilities.

Financed through public tariffs:

- Approval of reports, tests, or studies on new designs, methodologies, simulation models, or protocols related to nuclear safety or radiation protection.

This area of financing amounts to 38.199,60 million euros for 2007 and represents 87.17 % of the total budget.

Financed partly against the General State Budget

The Nuclear Safety Council carries out control of measures for the radiation protection of the general public and the environment. The performance of these functions does not constitute the taxable transaction of fees and public tariffs regulated in Law 14/1999. Its financing comes from the General State Budget via the Ministry of Industry, Tourism and Trade.

The financing obtained in respect of this item amounts to 5,283.55 thousand euros and represents 12.6 % of the total budget.

The rest of financing (0.77 %) mainly corresponds to equity revenues derived from bank account interest rates.

The following table displays, in thousands of euros, the evolution of the budget in the last few years derived from the most significant concepts:

Government Transfers	1,766.84	5,055.13	5,095.03	5,283.55

Nature of the Revenueo	Year 2004	Year 2005	Year 2006	Year 2007
Fees, Public Tariffs	32,442.21	32,825.59	35,616.40	38,199.60
General State Budget	1,766.84	5,055.13	5,095.03	5,283.55

From the total financing, 56.64 % is allocated to cover personnel costs, which amounts to 24,820.53 euros for 2007, and 26.26% to expenses in current goods and services, which turn out to be 11,507.51 euros.

As of December 31, 2006, and including the eight top management posts (the President, four Board Members, the Secretary General and two Technical Directors), the CSN's personnel staff numbered 442 people, of which 206 are civil servants belonging to the Nuclear Safety and Radiation protection Technical Unit dedicated to the inspection, control, and monitoring of the operation of nuclear and radioactive facilities; another 123 are civil servants belonging to other public administrations; 18 are part-time office personnel; and 87 have a full-timework contract. (Refer to Table 8.2.)

Table 8.2: Distribution of the Nuclear Safety Council's personnel as of 31th December, 2006

	Council	General Secretariat	Technical Directorates	Total
Top Management Posts	5	1	2	8
Civil Servants belonging to the NS and RP Technical Unit	3	16	187	206
Civil Servants belonging to other Public Administrations	6	91	26	123
Part-Time Personnel	17	1	0	18
Contract Personnel	5	57	25	87
Totals	36	166	240	442

8.2.5 CSN Personnel Training Plan

The Annual Training Plan – set up in the 1990s in order to achieve a better qualification of the personal and cover the needs for adaptation to the new working methods demanded – was integrated in the framework of the CSN Strategic Orientation Plan.

The Training Plan is configured as a tool at the service of the CSN strategic objectives – as have been defined in the "CSN Strategic Plan" – facilitating and promoting the fulfilment of the CSN Mission and Vision.

The CSN training strategy is the result of the accumulated experience, as well as the efforts made within the Training Coordination Commission, created by the CSN at its meeting of 3rd February 2004.

The publication of the CSN Mission and Vision and Strategic Plan redirected the training strategy, requiring its alignment with the latter, which has become a tool at the service of the fulfilment of the objectives set out therein.

The effectiveness of the training thus directed not only has enabled to continue to improve the development of the 2005 Plan but also has its continuation in document "Estrategia General en Materia de Formación: Training 2006" (General Training Strategy: Training 2006) (SG/PF06/01/Rev.2/Oct.05), approved by the CSN on 5th October, strategy that materializes in the proposal of the 2006 Training Plan.

All training activities were regrouped in six areas:

- Nuclear Safety Area.
- Radiation Protection Area.
- Development of management, Organisational and Communications Skills Development Area.

- Administration and Management Area.
- Information Systems Area.
- Languages Area.

The Plan has been assessed annually, and different measures have been adopted to adapt it to the specific needs of the units, as has been requested.

The assessment of the 2004-2006 triennium has to be deemed positive as a whole. The expenses made in training tasks amounted to 1,817,296 euros, which represents an annual average of about 605,765.33 euros. Furthermore, the training programme for a group of people such as that of the CSN, the number of which has remained practically constant, has made it possible to cover most of the general and specialist training objectives.

Likewise, the presence of the CSN in national and international forums (congresses, meetings, seminars, etc.) related to its functions and areas of competence continue to be promoted.

Table 8.3 shows the evolution of the number of attendees and the hours of attendance

	Number of Attendees	Total Hours
2004	1,114	44,733
2005	1,391	36,119
2006	1,018	33,975

8.2.6 Evolution of CSN International Relations

International relations play an essential role in the fulfilment and exercise of the functions that the current Spanish legal system bestows on the CSN. The CSN's international activities are carried out on two different planes, the multilateral, through international bodies, institutions, and forums, and the bilateral, through agreements with equivalent institutions.

The fundamental international activity in the sphere of multilateral relations is made up of the CSN involvement in the governing bodies, advisory committees and technical working groups of the International Atomic Energy Agency (IAEA), the European Union (EU), and the Nuclear Energy Agency (OECD/NEA). In parallel to these relations with international bodies, the CSN participates in associations made up of peer institutions. New initiatives are studied and regulatory practices and policies are exchanged within this framework. Specifically, the CSN actively takes part in the work of the International Nuclear Regulators Association (INRA), the Western European Nuclear Regulators' Association (WENRA), and the Ibero American Forum of Radiological and Nuclear Regulatory Bodies (FORO).

Likewise, the CSN collaborates with international non-governmental institutions such as the International Commission on Radiation Protection (ICRP).

Furthermore, the CSN maintains bilateral agrements or protocols, or agreements with foreign equivalent bodies.

IAEA

The CSN actively takes part in the IAEA's activities, being part of the Spanish Delegation before its General Conference.

As for its involvement in technical activities, the CSN closely monitors the IAEA's working programme, actively participating in it. Thus, the CSN continued to take part in different technical and advisory committees and working groups. More specifically, it has taken part in the International Nuclear Safety Advisory Group (INSAG), and the Commission on Safety Standards (CSS) and its groups: the Nuclear Safety Standards Committee (NUSSC), the Radiation Safety Standards Committee (RASSC), the Transport Safety Standards Committee (TRANSSC), and the Waste Safety Standards Committee (WASSC). Additionally, the CSN participates in other working groups such as the Working Group of the International Nuclear Event Scale (INES) and in research projects promoted by the IAEA.

The Spanish Government and several Spanish bodies and institutions have been carrying out allocations and contributions for the maintenance of some of the Body's technical cooperation programmes and programmes of other nature. In particular, during this period the CSN has provided extra-budgetary contributions for assistance projects on nuclear safety and radiation protection issues in the sphere of the Latin American Forum of Radiological and Nuclear Regulatory Bodies as well as for international cooperation in other assistance projects. The CSN also collaborates receiving scholarship holders (10 scholars from the IAEA were received during the 2004-2006 period) and scientific visits from other countries or providing technical support for the teaching of training workshops organised by the IAEA.

Conventions

In 2005, the CSN took part in the drawing of the Second National Report on the compliance with the Joint Convention on Spent Fuel Management Safety and on Radioactive Waste Management Safety, together with the Ministry of Industry, Tourism and Trade, the National Radioactive Waste Company (Enresa) and the Spanish Electricity Industry Association (Unesa).

Likewise, during this period the CSN has taken part in activities and in the compliance with the commitments made by means of its accession to other Conventions to which it belongs, such as:

- The Convention on Nuclear Safety, participating in the review phase of the Third National Report.
- The Convention on the Physical Protection of Nuclear Materials, in relation to which it actively took part in the preparation and approval of the draft amendment of the Convention from July 2005.
- The OSPAR Convention; the CSN is a member of the Radioactive Substances Committee and prepares the periodic report on nuclear installation releases required by the Convention.
- The Convention on the Prompt Notification of Nuclear Accidents.
- The Convention on Mutual Assistance in case of Nuclear Accidents or Radiological Emergencies.

European Union

Multilateral relations within the European Union are very important for Spain, in particular the activities derived from the Euratom Treaty.

The CSN actively takes part in Community activities related to nuclear safety and radiation protection, as well as, in those that favour the cooperation between Member States in these areas.

In particular, the CSN assists Spain's Permanent Representation in issues related to nuclear safety and radiation protection and participates in the activities of the Council's Atomic Questions Group (AQG) in which these matters are dealt with.

In December 2004, the AQG activated the so-called "ad-hoc" Group on Nuclear Safety in order to conduct an extensive discussion among the Member States so as to improve the consistency and coherence of Community approaches in the fields of nuclear safety and radioactive waste management. The CSN actively took part in the development of the consultation, integrating itself in the *ad-hoc* Group and designating representative technicians in two of the three working subgroups set up by the ad-hoc Group. The result of the consultation was materialised in a Council Conclusion project that was submitted by the AQG to said institution in December 2006.

Furthermore, the CSN provides representatives to the Advisory Committees of several articles of the Euratom Treaty.

Within the Community framework, the activities of assistance – mainly within the framework of the Regulatory Assistance Management Group (RAMG) that advises the European Commission in connection with nuclear safety cooperation programmes – that the European Commission had been rendering through the TACIS programmes for Central and Eastern European countries not belonging to the EU and the PHARE programmes for candidates States for the enlargement of the EU, may also be highlighted. Furthermore, it takes part in regulatory assistance programmes financed from said Community assistance programmes.

During this period, the CSN has participated in the following assistance projects:

- TAREG 01/01, of assistance to the Commission in order to review the projects executed, assess the benefits obtained by the countries that received aid and identify future projects of assistance to beneficiary countries.
- UK/RA/05, of assistance to the Ukrainian regulatory body on quality assurance matters.
- UK/RA/06, specifically in two sub-tasks: sub-task 1.2. on the Development of the Regulatory Pyramid, and sub-task 3.2. on personnel emergency training. Both sub-tasks will likely be completed at the end of 2007.

NEA

Within the scope of the NEA/OECD, the CSN belongs to the Spanish Delegation before their Steering Committee and continues to actively take part in the technical committees and working groups to which it belongs: the Committee on the Safety of Nuclear Installations (CSNI), the Committee on Nuclear Regulatory Activities (CNRA), the Radioactive Waste Management Committee (RWMC), the Committee on Radiation Protection and Public Health (CRPPH), the Nuclear Science Committee (NSC), and the Nuclear Law Committee (NLC). Likewise, the CSN belongs to multiple international research and development programmes and projects coordinated by NEA, and collaborates in the management and development of International databases.

As a result of an incident that took place in Vandellós II nuclear power plant in 2005, the Industry, Tourism and Trade Commission of the Spanish Congress of Deputies urged the CSN to commission an independent and detailed assessment of the report on learnt lessons that the former prepared to analyse said event. In compliance with this resolution, NEA was commissioned to form an international expert group to conduct this assessment. The completion of the work and official presentation of the report took place throughout 2006. During 2006, a significant delegation of CSN technical staff, covering the nuclear safety and radiation protection areas, travelled to the USNRC as part of the benchmarking exercise recommended by the NEA team that reviewed the CSN's report. Within this process, a comparative analysis of the organisation, inspection, training, event assessment and response, continued self-assessment, coercive activity, and public information techniques used by the CSN and the USNRC was conducted.

Ibero American Forum of Radiological and Nuclear Regulatory Bodies

The Ibero American Forum of Radiological and Nuclear Regulatory Bodies (FORO) is made up of the nuclear and radiological safety authorities of the countries of the region. Initially it was comprised of Argentina, Brazil, Cuba, Mexico and Spain. In 2006, Spain encouraged the incorporation in the FORO of other countries of the Ibero American region, managing to integrate Uruguay as a full member since June 7, 2006.

The Forum, with technical and financial support from the CSN, has carried out in this period the design, development, implementation and operation of a network that allows nuclear, radiological and waste knowledge to be managed and transferred in order to improve the radiological safety levels in the region. The promotion and consolidation at an international level of a network that effectively responds to national interests in the subject, is perfectly integrated in the international community and has a great impact on the Ibero American region has been achieved.

During this period, the consolidation of the FORO technical programme – which is inspired by regional needs and priorities and is technically supported and provided with resources through the IAEA's extra-budgetary programme for the improvement of nuclear and radiological safety in Ibero America – has been achieved. Throughout its activity, the Executive Technical Committee has tackled projects related to: national and international safety regulations; radiation protection of the patient; control of radioactive sources; and education and training. The technical programme will consider, among other projects, the assessment of safety in radioactive facilities by means of the application of probabilistic safety assessement techniques, risk-informed inspections in aspects related to nuclear safety, review of IAEA guides published in Spanish, etc.

On the other hand, during this period the statutes of the FORO were reviewed, its new statutes having been approved in 2006. These modify FORO's founding act (written in Veracruz, Mexico, in 1997), developing its nature and organizational structure.

Bilateral

The CSN has signed agreemet with bodies carrying out equivalent functions in 19 countries. It has specific agreements with four of these countries: USA (US Nuclear Regulatory Commission, USNRC), Sweden (Swedish Nuclear Power Plant Inspectorate, SKI, and Swedish Radiation Protection Authority, SSI), France (with the French regulatory body, ASN, and the Nuclear Safety and Radiation Protection Institute, IRSN) and the UK (with the British regulatory body, HSE, and the National Radiation Protection Board, NRPB).

These agreements are a good experience for the exchange of information and regulatory practices. Thus, a permanent and enriching cooperation on knowledge and experience in the fields of nuclear safety, radiation protection, and waste management has been set up.

Throughout this period, the bilateral contacts – in the shape of annual, high-level meetings between the bodies – that lay the foundations for the work and technical exchange during the year have been maintained.

Given that most of the Spanish nuclear power plants use technology developed in the United States, the relationship with the American regulatory authority is very fluid and the exchange of information very intense. As part of the efficiency improvement programme started by the CSN, as well as of the development and implementation of the new Integrated Plant Supervision System (SISC) based on the American Reactor Oversight Process (ROP), the visits by CSN technicians and inspectors to their peers in the USNRC and vice versa – including the attendance and participation in courses and conferences – have been intensified.

Likewise, the excellent bilateral relationship with France, our neighbouring country, stands out; enriching experiences of cross inspections, apart from activities that fall into more specific work areas, have emerged from the collaboration agreements.

Bilateral meetings were also held with the equivalent bodies of Sweden, the Russian Federation, the Republic of Ukraine, South Korea and Cuba, apart from other meetings with countries with which the CSN has not signed any bilateral agreements, as is the case of Japan's Nuclear Energy Safety Organization (JNES).

INRA and WENRA

The International Nuclear Regulators Association (INRA) and the Western European Nuclear Regulators Association (WENRA) are important meeting forums for the top representatives from regulatory bodies to identify common interest matters for improving nuclear regulation and exchanging points of view on global regulatory policy issues.

INRA initially included the eight countries with most experience in nuclear activity licensing (Germany, Canada, USA, France, Japan, the UK and Sweden); since September 2006, the Republic of South Korea has representation in INRA as a new official and full member. The terms of reference of the association establish an open dialogue where general information is exchanged.

With the recent enlargement of the European Union and in order to harmonize the safety of nuclear installations in the EU, initiatives and programmes were set in motion within the institutions that comprise it. The Western European Nuclear Regulators Association (WENRA) was constituted for the purpose of setting up a regional forum that allowed the exchange of information and experience on nuclear safety and the development of mechanisms that lead to its harmonisation in the short- and medium-terms. The association is focused on the identification and application of reference levels in nuclear power plants, temporary spent fuel storage facilities and nuclear facilities dismantling. This way, member countries of the Association have an independent tool that might help them assess their facilities and know the relationship of their national safety level with regard to the countries of the WENRA environment.

8.2.7. Evolution of R&D activities and results obtained

The R&D activities fostered by the CSN during the past three years have contributed to improve the knowledge, methods and tools used by CSN personnel in the execution of their functions, helping to make their actions more efficient and effective. They also

contributed to increase the competence of the organisations that are the licensees of regulated facilities or activities and of those that provide support to the CSN or the licensees, such as research centres or universities. This has been based on the establishment of twenty specific agreements with such entities as well as on the official announcement and awarding of subventions (30 in 2004, and 11 in 2005) for the development of projects deemed more suitable for this purpose, a great number of which are still under way given the multiannual character thereof.

In accordance with the established strategic plan, which covers the 2005-2010 period, R&D activities have been structured in the nine large programmes that were described in the previous Report; in each of them, the most specific aspects that were demanded each year have been being prioritised.

Said strategy envisages joining international projects that make the execution of costly experiments, as well as the verification of the interpretation thereof, possible with the participation of a large group of countries with a high technological level; actions have been taken accordingly. Several projects promoted by the OECD's Nuclear Energy Agency may be highlighted in this regard. The cooperation with the United States' regulatory body (USNRC) can also be stressed, especially when the fact that this is the country of origin of the design of most of the nuclear power plants that operate in Spain is taken into account.

Given that research is not an end in itself but a means to improve the capabilities for solving the problems that arise, it has been deemed important to spread the results of the projects insofar as this is advisable. As methods for this purpose, the involvement in working groups, the writing of periodic product and benefit reports, the annual reports submitted to the Congress of Deputies, and the holding of technical symposiums in which to exchange points of view – the last of which was held last November – have been taken into consideration.

The funds used in the last three years for R&D activities have been:

Year 2004 3,415,000

Year 2005 3,366,000

Year 2006 1,960,000

Appendix 8.B contains the R&D projects completed in 2004, 2005 and 2006.

Within this area, the role of the Nuclear Fission Energy Technological Platform (CEIDEN), set up in 2007, the objectives of which are to coordinate the different national R&D plans and programmes as well as to participate in international programmes, endeavouring to coherently direct the efforts of the entities involved, may be emphasised.

The MITYC, the CSN, the Ministry of Education and Science, the Energy, Environmental and Technological Research Centre (Ciemat), Universities, and representatives of companies linked to the nuclear power sector are represented in the Platform's governing board.

8.2.8. CSN public information policy

Among the functions assigned in the Law of Creation of the CSN is that of "to inform the general public about the issues within its realm of competence" and, for this purpose, the regulatory body has promoted in the last years the development of activities aimed at the communication with society, designed and undertaken under the principles of agility and rigour.

Basically, the purpose of the information actions carried out is to provide the general public opinion with direct and verified information in the shortest time possible. The body's action guidelines are generally the following:

- Elaboration and diffusion of the information of interest to the population in keeping with the mission carried out by the CSN and using all the information channels available.
- Promotion from the CSN of the issuance of complete information in as much advance as possible and adapted to the target public. From the body, publications and briefing notes are written to exhaustively announce the different angles of the work daily done by the body.
- Participation in all information relating to the competences of the CSN, clarifying the scope of its functions and promoting the body's credibility.
- Homogenisation of the contents of the information; criteria for issuing and spreading specific events that must be notified so as to expedite as much as possible the procedures have been set up. It is all about speedily and clearly informing the interested parties about the events that might take place, including the emergency drills periodically carried out by the facilities.
- Giving response, in a dynamic and integral way, to any specific demand of information by the public, communication media professionals and interest groups.

The trend observed in these last few years by means of the indicators available to analyse the interest in information of society reveals that there is a growing and increasingly demanding interest with regard to issues related to nuclear safety and radiation protection.

For this reason, the CSN's Information and Communication section has placed the emphasis on aiming the different communication tools at satisfying the needs that emerge. In particular, the channels used are the following:

- Attention to the media opinion leaders and authorities: Information actions entail a previous search and analysis of the information conducted with the support of the technical directorates. Subsequently, the information is elaborated and circulated among the concerned authorities and institutions, associations, stakeholders, and media, by means of different channels and in a simultaneous manner, to ensure the lowest possible level of incident. When there is an interest in expanding or clarifying the information issued, said actions are complemented with direct contacts by telephone, fax or e-mail with media professionals.
- Organisation of Training Conferences, Seminars and Activities: The CSN participates or collaborates with other public and private institutions in organising different events aimed at promoting the knowledge of issues directly or indirectly related with its functions. For the same purpose it takes part in several fairs and congresses with informative and educational stands.
- Institutional Website: The site contains both static and current information on all the CSN's relevant activities and provides a mailbox for sending requests about specific information or publications. As a new feature, it can be highlighted that since August 2006 the CSN publishes the inspection and technical reports required to be issued prior to the issuance of the preceptive nuclear permits.
- Information Centre: It is an interactive space –open to the public and free– that deals with all the activities related to the CSN's mission and which has already received around 50,000 visitors since it opened in 1998. In 2006 it received 6,438 persons, mostly from education centres and institutional delegations, as well as members of the International Atomic Energy Agency, other regulatory bodies and Sweden's Radioprotection Institute.

- Edition of Publications: The CSN carries out a wide-ranging publishing activity, of a technical and informative nature, which is in keeping with the annual publication plan. The publication of the annual Report to the Congress of Deputies and the Senate, the quarterly journal "Seguridad Nuclear" (Nuclear Safety), safety guides and other technical documentation, collections on different subjects related to nuclear safety or radiation protection, single-issue publications with different interests, and corporate information, can be highlighted.

8.3 Regulatory Efficiency improvement programmes

8.3.1. Improvement of the efficiency of the regulatory body's processes

Several programmes started in order to improve the efficiency of the regulatory process were announced in the Third Spanish National Report. A Working Group made up of representatives of both the CSN and the electricity sector was created to carry out said work.

As was already referred to in the previous National Report, the Working Group's Action Plan was structured around a series of tasks:

Task 1	Preparation of documents on CSN and licensee Policies
Task 2	Establishment of a Regulatory Pyramid and gathering of licen sing bases
Task 3	Definition of a supervisory system inspired in the NRC's Reac-tor Oversight Process
Task 4	Improvement of licensee self-assessment and corrective action programmes
Task 5	Analysis of the changes in the current legislation on the disci-plinary system
Task 6	Classification of the documentation required by licensing de pending on whether it is for assessment or supervision
Task 7	Analysis and adaptation of new risk-informed regulations
Task 8	Improvement of assessment processes
Task 9	Suitability of periodically informing the licensees. Reduction of bureaucratic procedures and general improvement of the disciplinary system
Task 10	Streamlining of the ETS exception process and improvement of the quality of the licensees' documentation

The main milestones reached in relation to these Tasks – almost completed – during the period up to the present Report are listed below.

As far as Task 2 is concerned, on 7th September, 2005, the Plenary Meeting of the CSN approved the documents corresponding to this task: document "Pirámide Normativa y Bases de Licencia" (Regulatory Pyramid and Licensing Basis), as well as the conditions for the Long-Term Operation of Spanish Nuclear Power Plants. The Plenary Meeting also encouraged the implementation, for both the sector and the CSN, of the actions on each of the aspects analysed.

As an application of these documents, a Complementary Technical Instruction on the applicability of the regulations of the country of origin of the design was approved on 10th May, 2006, in order to collect and send the information that is provided to each of

the Spanish Nuclear Power Plants (10 CFR 50 and 10 CFR 100 for plants of American design, and criteria BMI3.01 and applicable portion of 10 CFR 50 and 10 CFR 100 for Trillo nuclear power plant), for the fulfilment of which a maximum term of 6 months was set.

Likewise, in application of the applicable regulations – sustained on the documents approved on 7th September, 2005, and based on the report from the Technical Directorate for Nuclear Safety and on that envisaged in Condition 13 of the Appendix to the Ministerial Order of 5th July, 1999, of the Ministry of Industry and Energy – the Plenary Meeting of the CSN agreed on 20th October, 2006, to approve the Technical Instruction Complementary to the Operating License of Santa María de Garoña Nuclear Power Plant on conditional application regulations.

Tasks 8 and 10 are jointly carried out, and the Working Group approved and edited several documents from which the "Guía de elaboración y evaluación de solicitudes de exenciones temporales a las Especificaciones Técnicas de Funcionamiento (ETF)" (Guide for the preparation and assessment of request for temporary exemptions to the Plant Technical Specifications (PTSs) was prepared, which was approved by the Plenary Meeting on 29th June, 2005. A guide document to be applied by licensees in connection with the documentation to be submitted to the CSN was written in order to include in the latter the minimum quality requirements.

As a culmination of Task 3, the CSN's Plenary Meeting approved on 15th September, 2004 the adoption of the Integrated Plant Supervision System (SISC) as the new system for supervising the operation of nuclear power plants.

The SISC has been the object of a previous breaking-in so as to familiarise the CSN's inspectors and the licensees of the facilities with the new supervisory system. The breaking-in was initiated during the second half of 2005, it being effectively applied in 2006 for internal purposes. This period has served to finish unresolved aspects, put the set of elements of the new supervisory model in practice, and provide the necessary capability and safety in the application of the new processes and indicators.

The system is fully operative since January 2007.

As far as Task 1 is concerned, document "Políticas de Actuación del CSN" (CSN Action Policies), which was submitted to the CSN's Plenary Meeting at the end of 2004 and, finally, approved by the Liaison Committee CSN-Enusa in January 2005, was written.

A document on "Licensee Policies" was also written, even though in this case, by virtue of being a generic guide and affecting the different plants, it required a subsequent period for it to be specifically incorporated in each plant.

Two guides were prepared within the framework of Task 4: one for the self-assessment programme and another for the corrective action program, which were edited in July 2003; two phases were agreed for their implementation.

A first phase of preparation of the specific procedures of each plant, development of the software applications for PAC management and information spreading and imparting, ended in 2004, throughout which the specific procedures of each plant were assessed.

A second, more complex phase, dedicated to the implementation, application and introduction of improvements in the programmes, was started in 2005 and has been being completed at each of the plants.

Task 6 was capped with the review of the CSN's internal procedure (PT-IV-51) that includes the general treatment that must be followed in relation to the documentation of nuclear installations.

In the execution of Task 7, a first activity consisted of the analysis of the documentation generated on this subject in the USA; a document was prepared that included the state of the art in the development and implementation of risk-informed regulations. Likewise, the application experience of some pilot programmes in American plants was collected and a pilot project for the application of risk-informed regulations in two systems of Cofrentes nuclear power plant was carried out within the analysis of the application of risk-informed regulations to Maintenance Rules (10CFR 50.69).

All activities related to this task ended throughout 2004, and the final reports were edited, which were approved by the Working Group. The monitoring of the evolution of the activities related to this issue is performed in a joint group on Safety and Operation of the CSN and the Electricity Sector.

8.3.2 Improvement of the efficiency of licensee processes interacting with those of the regulatory body

In the period covered by this report, nuclear power plant licensees have been collaborating with the CSN in the search for new practices and measures –to be implemented in both parties– that improve the efficiency of the processes for generating and applying regulations and assessing, inspecting and controlling the facilities as well as of corrective measures. All of them are also aimed at achieving an improvement in mutual communication and trust.

Some identified measures have been widely implemented by the licensees, forming part of the Integrated Safety Management System (refer to Section 10.1), such as the self-assessment programmes and the Corrective Action Programme (CAP). The latter considers the safety significance of the measures to be taken in order to ensure that they are all satisfactorily met. Likewise, new methods are being put into practice for the selection of newly issued regulations, the applicability of which has to be analysed and, if the case may be, implemented in order to ensure that the plants maintain and improve the safety level of their operation to a reasonable extent, contributing as one more aspect to the on-going improvement programmes that the plants have under way.

8.4 Degree of Compliance with the Obligations of the Convention

Spain meets the requirements of the Convention as far as the resources and independence of the Regulatory Body are concerned, and it has made significant progress in the degree of compliance with the obligations of the Convention with the changes mentioned in this article about regulatory efficiency improvement programmes.

Appendix 8.A

Procedures approved as of April 16, 2007

Management procedures

PG.II.01. Institutional Relations.

PG.II.02. International Relations.

PG.II.03. Public Information.

PG.II.04. Assignment Agreement.

PG.II.05. Relations with the Administration and with stakeholders and Entities.

PG.II.06. Spreading of Specific Information.

PG.III.01. Regulation Proposals.

PG.III.02. Preparation and Review of the Nuclear Safety Council's Safety Instructions (SIs) and Guides (SGs).

PG.IV.01. Mandatory CSN reports to the Administration Nuclear and Radioactive Facilities of the fuel cycle.

PG.IV.02. Mandatory CSN reports to the Administration. Radioactive Facilities.

PG.IV.03. Inspection and Control of Nuclear Facilities.

PG.IV.04. Inspection of Radioactive Facilities, Transport and other Regulated Activities.

PG.IV.05. CSN interventions in sanction proceedings relating to NS and RP.

PG.IV.06. Control of Radioactive Facilities and other Related Regulated Activities.

PG.IV.07. Integrated Plant Supervision System (SISC).

PG.V.01 . Planning, Scheduling, Tracking and Control of Activities.

PG.V.02. Project management.

PG.V.03. Management of External Supplies and Services.

PG.V.04. Annual Budget.

PG.V.05. Fees and other revenues.

PG.VI.01. Collaboration with the Administration in Emergency Plans.

PG.VII.01. Control and Surveillance of Radiation Levels. Exposed Workers.

PG.VII.02. Control and Surveillance of Radiation Levels. The Public and the Environment.

PG.VIII.01. NF Personnel Licenses.

PG.VIII.02. RF Personnel Licenses.

PG.IX.01. Research activities.

PG.XI.01. Documentary Management.

PG.XI.02. Quality Management.

PG.XI.03. Information Systems.

Administrative procedures

PA.II.01. Classification of Events using the INES Scale.

PA.II.04. Updating and Maintenance of the corporate Website.

PA.II.09. Publication of Inspection reports.

PA.IV.01. Basic Programme of Inspections to Nuclear Facilities in Operation.

PA.IV.08. Preparation, Procedure and Formality of NF Inspection reports.

PA.IV.09. Treatment of Deviations Derived from the CSN's Inspections to Nuclear Facilities.

PA.IV.10 Preparation and Execution of Inspections to Nuclear Facilities.

PA.V.01. Annual Planning.

PA.X.02. Radiation Protection of the CSN's Exposed Workers.

PA.XI.01. Internal Audits.

PA.XI.03. Computer Support.

PA.XI.05. Information System Maintenance.

PA.XI.07. Security Measures for files containing personal data.

PA.XI.08. Treatment, custody and access to confidential documentation related to the Security of Nuclear Facilities and Materials.

PA.XI.09. Personal Data Processing.

PA.IV.201. Troubleshooting Programme.

PA.IV.202. Manual for the Calculation of Performance Indicators of the Integrated Plant Supervision System. Performance Indicator Verification.

PA.IV.203. SISC Performance Indicator Verification and Inspection.

PA.IV.204. Screening of Inspection results.

PA.IV.205. Documentation of Integrated Plant Supervision System (SISC) Inspections.

PA.IV.206. Committee for the Categorisation of Integrated Plant Supervision System (SISC) Findings.

PA.IV.207. SISC Self-Assessment Programme.

PA.IV.250. Supplementary Level 1 Inspections.

PA.IV.251. Supplementary Level 2 Inspections.

PA.IV.252. Supplementary Level 3 Inspections.

Technical procedures

PT.IV.06. Assessment and Inspection of nuclear and radioactive facilities quality assurance programmes.

PT.IV.07. Assessment and Inspection of Quality Assurance Programmes of the Suppliers of Equipment and Services for Nuclear Facilities.

PT.IV.08. Assessment of Q Lists.

PT.IV.09. Resident Inspector's Manual.

PT.IV.10. Evaluation of the Planning of Refuelling Outages in NPPs.

PT.IV.11. Evaluation of Periodic reports for the dismantling of Fuel Cycle Nuclear Facilities and NFs.

PT.IV.15. Inspection for the Control of the Process of Acceptance of Low- and Intermediate-Level Wastes for disposal at El Cabril.

PT.IV.16. Evaluation of the Structural Integrity of Post-Stressed Containments.

PT.IV.17. Evaluation of the Chemical Parameters in the Reactor Cooling System and Main Systems of Spanish NPPs.

PT.IV.19. Inspection of the Structural Integrity of Post-Stressed Containments.

PT.IV.20. Inspection of Periodic Class 1E Battery Tests.

PT.IV.21. Inspection of the Emergency diesel generators reliability maintenance.

PT.IV.26. Evaluation and tracking of the Periodic Ground Movements at controls in Nuclear Facilities.

PT.IV.28. Evaluation for the Approval and Validation of Transport Packages.

PT.IV.29. Control of sources supplies.

PT.IV.30. Inspection in the Transport of Nuclear Substances and Radioactive Materials.

PT.IV.31. Inspection of Radioactive Facilities.

PT.IV.33. Evaluation of Radiation Protection Services and Technical Units.

PT.IV.34. Evaluation of medical diagnosis x-ray equipment sales and technical assitance companies.

PT.IV.36. Performance of Inspections of Radiation Protection Technical Units Rendering to medical diagnosis x-ray facilities

PT.IV.37. Evaluation of Precursors by means of the PSA.

PT.IV.40. Evaluation of Probabilistic Safety assessment (PSA) Application Proposals.

PT.IV.41. Evaluation of Radioactive Material Transport Authorisation Requests.

PT.IV.42 Inspection of Nuclear Facility site emergency plans.

PT.IV.48. Evaluation and Inspection of the Programme of Environmental Qualification of Equipment in NPPs.

PT.IV.51. General Processing of Nuclear Facilities documentation by the CSN.

PT.IV.57. Evaluation of Nuclear Medicine Radioactive Facilities.

PT.IV.59. Evaluation of the Radioactive Facilities of Medical and Research Laboratories.

PT.IV.60. Evaluation of Soil Humidity and Density Measuring Facilities.

PT.IV.61. Evaluation of Process Control Radioactive Facilities.

PT.IV.62. Evaluation of PSA Level 2 and its Application to Severe Accident Management.

PT.IV.63. PSA of nuclear facility seismic surveillance programmes.

PT.IV.66. Evaluation of Radioactive Facilities with Instrumental Analysis Equipment.

PT.IV.67. Evaluation Process on issues relating to NPPs.

PT.IV.68. Categorisation of Findings.

PT.VI.03. Automatic Station Network (ASN) Operating Manual.

PT.VI.04. Intervention of the Opertions Analysis Group in event of Emergency Situations in NPPs.

PT.VI.05. Coordination of CSN interventions for the Control and Removal of Orphan Radioactive Sources or Materials.

PT.VI.06. CSN Intervention in the event of the Detection of Radioactive Material among the Metals for Recycling.

PT.VII.05. Procedure for Acting in cases where the Dose Limits in Radioactive Facilities Workers are exceeded.

PT.IV.201. Protection against Severe Weather conditions and flooding.

PT.IV.202. Design Modification Safety Analysis and Assessments.

PT.IV.203. Equipment Alignment.

PT.IV.204. Fire Protection (biennial).

PT.IV.205. Fire Protection (resident inspection).

PT.IV.206. Heat Exchanger and Final Heat Sink Operation.

PT.IV.207. In-Service Inspection.

PT.IV.208. Personnel Training.

PT.IV.209. Maintenance Effectiveness (Resident Inspection).

PT.IV.210. Maintenance Effectiveness (Biennial).

PT.IV.211. Emerging Work Management and Control Activity Risk Assessments.

PT.IV.212. Performance of Operators during the Evolution of Non-Routine Events and Incidents.

PT.IV.213. Operability Assessments.

PT.IV.214 Operator Compensatory Measures for Non-Compliance Situations.

PT.IV.215. Permanent Design Modifications.

PT.IV.216. Inspection of Post-Maintenance Tests.

PT.IV.217. Refuelling and Other Outage Activities.

PT.IV.218. System Design and Operational Capacity.

PT.IV.219. Surveillance Requirements.

PT.IV.220. Temporary Changes.

PT.IV.221. Plant Status and Activity Tracking.

PT.IV.222. Unannounced Inspections.

PT.IV.223. Lifetime Management.

PT.IV.224. Organisation and Human Factor Programmes.

PT.IV.225. PSA Updating and Maintenance.

PT.IV.226. Inspection of Reportable Events.

PT.IV.227. Inspection of Spent Fuel and High-Level Waste Management Activities.

PT.IV.251. Treatment, Monitoring and Control of Liquid and Gaseous Radioactive Effluents.

PT.IV.252. Environmental Radiological Surveillance Programme (ERSP).

PT.IV.253. Inspection of Low- and Medium-Level Radioactive Waste (LMLW) Management Activities.

PT.IV.254. Inspection of Residual Material Declassification Activities.

PT.IV.255. Inspection during the Transport of Nuclear Substances and Radioactive Materials in Nuclear Power Plants.

PT.IV.256. ALARA Organisation, Planning and Control.

PT.IV.257 Controlled Area Access Control.

PT.IV.258. Radiation Protection Instrumentation and Equipment.

PT.IV.259. Radiation Protection Training.

PT.IV.260. Inspection of the Maintenance of the Emergency Response Capacity.

PT.IV.261. Inspection of Emergency Drills. Inspection after an Actual Emergency.

PT.IV.301. Process for Determining the Significance for Power Situations.

PT.IV.302. Process for Determining the Significance for Fire Protection.

PT.IV.303. Process for Determining the Significance for Containment Integrity.

PT.IV.304. Process for Determining the Significance for Outage Operations.

PT.IV.306. Process for Determining the Significance for Generator Tube Integrity.

PT.IV.307. Process for Determining the Significance for the Emerging Work Management and Control Activity Risk Assessments.

PT.IV.308. Process for Determining the Significance for PSA Maintenance.

PT.IV.310. Process for Determining the Safety-Significance of the SISC Emergency Preparedness Pillar.

PT.IV.311. Process for Determining the Safety-Significance of the Occupational Radiation Protection Pillar.

PT.IV.312. Establishment of the Risk-Significance of the Public Radiation Protection Pillar Findings.

PT.IV.401. Supervision of the Periodic Information relating to Radioactive Effluents.

PT.IV.402. Supervision of the Results of the Environmental Radiological Surveillance Programme (ERSP).

PT.IV.403. Supervision of the Periodic Reports Sent by the NPPs on the Activities Associated with Radioactive Waste Management.

PT.IV.404. Supervision of the Final Refuelling Reports. Occupational RP Aspects.

Appendix 8.B

R&D Projects Completed during the 2004-2006 period

Year 2004

- Establishment of the isotopic composition of high burn up fuel.
- Establishment of the mechanical properties of the irradiated cladding material under reactivity insertion accident stress.
- Methods for checking and validating operation procedures and accident management guides.
- Methodology, calculation tools and phenomenology associated with the application of Level 2 Probabilistic Safety Analyses.
- Cost-benefit analysis based on PSA/Phase II.
- Application of the PSA to the improvement of Plant Technical Specifications, considering "other modes" of operation.
- Application of the Characteristic Curve to the structural integrity of the reactor vessel (CUPRIVA Project).
- Irradiation-Assisted Stress Corrosion Processes (CIR II Project).
- Probabilistic Seismic Dangerousness Hazard Expert System (EXPEL Project).
- Application of the results of the monitoring systems to the assessment of the structural integrity of the pressure vessel of nuclear reactors (CRP-V Project).
- Natural Gamma Radiation Map (MARNA Project).
- Study of the induction and persistence of aneuploidy after in-vivo exposure to ionising radiations.
- Measurements of radon dissolved in waters of springs, wells, and sources in Extremadura.

Year 2005

- Participation in the MCCI (Melt Coolability and Concrete Interaction during a Severe Accident Ex-Vessel) Project.
- National HALDEN Agreement / 2003-2005 Triennium.
- Development of dynamic simulation probabilistic analysis methodology.
- Participation in a phase of the OPDE (OECD Piping Failure Database Exchange) Project.
- Study of the response of radon measurement systems under workplace environmental conditions.
- Assessment of radon levels in buildings, in areas with different gamma radiation exposure rates.
- Study of the suitability and effectiveness of the remediation actions against the presence of radon in existing buildings – 1st Phase.
- Advanced Environmental Radioactivity Measurement Techniques.
- Worker exposure due to natural radiation sources in some Spanish industries.
- Experimental *in-vitro* studies of the relative biological efficiency of reference radiations.
- Neutron and gamma dosimetry in an 18 MeV cyclotron during the production of positron-emitting radionuclides.
- Performance of nickel-based alloy X-750, with implanted He, under BWR reactor conditions, and its implications for irradiation-assisted stress corrosion processes (IASCC).

- Pilot project for the implementation of a Radioactive Waste Management Plan in a Nuclear Facility.

Year 2006

- Performance of highly-irradiated, advanced cladding materials under dry storage conditions.
- Spanish participation in the PROSIR Project.
- Performance against PWSCC of alloy 690TT in PWR reactors (first phase).
- Participation in the REVE (Réacteur Virtual d`Etudes) Programme.
- Participation in the SETH (SESAR Thermal-Hydraulics) Project.
- Participation in the MASCA II (Material Scaling) Project.
- Identification and quantification of uncertainties in LWR containment capacity analysis.
- BWR Plant Operating Procedure Validation and Verification Methods.
- PSAs of external events in “other modes” of operation.
- Study of the viability of Methodologies for calculating Frequency Margins in Risk-Informed Regulation applications.
- Impact of the Organisation on Safety (IOS II).
- Development of an Operating Incident database including organisational and human factors.
- Development of a new technique for the in-situ detection and assessment of radioinduced breaks at the specific DNA sequence level [II].
- Improvement of the National Internal Dosimetry System with INa counters and development of methodologies for calibrating and determining the activity in body radioactivity counters.
- Neutron dosimetry systems applied in nuclear facilities.
- Study of the risk associated with inhaling radon daughters in different work activities and in residential buildings.
- Adaptation of radiological water purification systems.
- Creation of a physical space for the development of organisational and human factor competences.

Article 9. Responsibility of the Licensee

9.1 Legal and Organisational changes occurred during this period

During the period considered there has been no legislative or regulatory modification affecting the requirements to be met by the licensee organisations.

Neither has there been any new process of consolidation in the nuclear industry or any significant change in ownership.

9.2 CSN Regulatory Strategy in relation to the Licensee's Organisation

The main criterion appied by the CSN as regard aspects relating to the licensee's organisational and management is that licensees are primarily responsible for the nuclear safety of their facilities. Thus, the main emphasis in this area has been placed on achieving a situation in which the licensees develop and implement all the processes required to maintain appropriate safety management systems and where these systems are developed by experts in these new disciplines taking into account internationally accepted standards. In that sense, the CSN is mainly following a process-based regulatory approach although obviously without ignoring the monitoring of the results.

The Operation Regulation of the facility is a legally required official operating document. This document contains the definition of the jobs post and their associated responsibilities, the organisation of the installation personnel, licensed- and non licensed-personnel training programs, and the operations and radiation protection standards for normal operation and accident conditions. The fact that changes to this document are subject to a formal process of approval facilitates tracking and control by the CSN of certain changes in the organisation and the organisation's management that night negatively affect its safety.

Futhermore,in view of the almost complete absence of criteria on the design of organisational structures an the abovementioned process-based regulatory approach, in 2000 it was required that all Spanish nuclear power plants develop their own procedures to analyse organisational changes implying a reduction in human resources. A report on technical capacities and minimum staffing was also requested. A multidisciplinary working group reviewed such reports, comparing them between plants, attemptions to identify particularly relevant aspects. Nuclear power plant licensees were informed of the aspects identified for their justification or for proposals regardins appropriate corrective actions. At any rate, the CSN attempted to place the emphasis on guaranteeing that licensees had systematic organisational change management processes. As a result, in 2002 all the nuclear power plants were requested to increase the scope of their procedures to include all type of organisational change, regardless of whether or not it implied a reduction in human resources. Thus, in order to meet the expectations of the CSN, the management of organisational changes in Spanish nuclear installations must be a systematic and procedural based process covering from the initial stage or conception of the change, response to identified needs to the detailed design implementation and monitoring of the effects of the organisational change and possible feedback or implementattion of corrective actions if it does not live up to expectations. The procedures already developed are based on standards and good practices, mainly from the IAEA and NEA.

The CSN is currently dealing with the task of implementing in Spain the IAEA's GS-R-3 "The Management System for Facilities and Activities", which introduces a serie of new requirements. In turn, this will entail the issuance of requirements by the CSN and devising a program for the implementation thereof in the nuclear power plants, as well as, the supervision of their correct implementation.

The CSN includes in its basic inspection plan the biennial inspection of each facility's programmes for assessing and improving safety as regards human and organisational factors. One of the aspects inspected is the one relating to organisational change management.

9.3 Liability for Nuclear Damages

9.3.1 Regime in force

Spain is a signatory of the Paris Convention, of 29 July 1960, on civil liability as regards nuclear energy, as well as of the Brussels Convention, of 31 January 1963, that complements the previous one. The Paris Convention establishes a regime of objective civil liability of the licensee of the facility for nuclear damages that may occur as a result of a nuclear accident. In accordance with this regime, the licensee of a nuclear installation or of a nuclear substance transport is bound to compensate the victims for the nuclear damages suffered in all cases, regardless of the causes of the accident. The licensee's liability is limited in both amount and time, expiring once 10 years have elapsed since the moment of the accident, and it must be covered by an insurance policy or another authorised financial guarantee. The Brussels Convention establishes a complementary regime of compensations for the victims above the first compensation bracket set by the Paris Convention.

The application of these Conventions within the Spanish law is established in Chapters VII, VIII, IX and X of Law 25/1964 on Nuclear Energy, which is developed by means of Decree 2177/1967, of 22 July, by which the Regulations on nuclear risk coverage are approved. The amount of civil liability ascribable to nuclear installation licensees – initially set in the internal legislation in accordance with the Paris Convention – was of 300 million pesetas (1.8 million euros), although, after the recommendations of the Steering Committee of the OECD's Nuclear Energy Agency, said quantity was raised to 25,000 million pesetas (150 million euros) in 1994 by means of Law 40/1994, which regulates the Spanish Electricity Sector. Also in accordance with the Paris Convention, the legislation envisages that, by justified request of the licensee, the civil liability of licensees of facilities deemed of low risk, as well as of nuclear substance transport, may be reduced to no less than 1,000 million pesetas (6 million euros).

Apart from the civil liability regime for nuclear installations and nuclear substance transport, Law 25/1964 envisages a specific civil liability regime for nuclear materials and ionising radiation-generating devices, which has been being updated by means of different regulatory developments.

9.3.2 Revision of the Regime in Force

Amendments to both the Paris and Brussels Conventions were approved on 12nd February 2004, which introduced, among others, the following significant changes:

1. The amounts of minimum liability ascribable to licensees are substantially increased, going from 15 million special drawing rights (SDR[1]) to 700 million euros for nuclear installations, and from no less than 5 million SDRs to no less than 70 and 80 million euros for low-risk installations and nuclear substance transports respectively.
2. The definition of nuclear damage is extended so as to include the damages caused to the environment as well as direct economic losses derived from the use and enjoyment of the environment.

[1] Unit of account periodically defined by the IMF. Exchange rate on January 2004: 1 SDR = 1.188 €.

3. The scope of geographical application of the Convention is extended so as to include as beneficiaries, under certain conditions, the victims from States which are not Parties to the Convention.

4. The claim period of victims due to personal injury is extended from 10 to 30 years.

At the same time, the Brussels Convention sets new limits for the two complementary compensation brackets above the first licensee liability bracket of 700 million euros established by the Paris Convention. With this, the limit set for the second bracket of compensations, which may be covered with public funds or by assigning the liability to the licensee, is now 1200 million euros, whereas the limit for the third bracket of compensations, which will be covered with public funds from all the States which are Parties to the Brussels Conventions, is now 1 500 million euros.

Spain ratified said amendments to the Paris and Brussels Conventions at the end of 2005, although, in accordance with a EU Council Decision, in order to ensure a uniform application of Community law in all the Member States of the EU which are Parties to the Paris Convention, the latter shall jointly deposit their ratification tools before the depository of the Convention. In the interim, a modification of the current regime of civil liability due to nuclear damages is currently being processed to reflect the significant changes that have been introduced in the Conventions. This legislative development, which will be embodied in a specific law on nuclear civil liability, has been particularly hindered by the limitations created by the private insurance company market to offering coverage for some of the risks included in the new nuclear damage definition of the Paris Convention, in particular those relating to environmental damages and the extension of the claim period due to personal injuries from 10 to 30 years. As a result of all of this, the bill being processed establishes a mechanism that, if needed, would allow giving state coverage of non-insurable risks in return for the payment of a premium.

9.4 Degree of Compliance with the Obligations of the Convention

As indicated in the previous National Reports, Spain meets the requirements of the Convention regarding the regulations and practices followed with respect to the responsability of licensees for the nuclear safety of their facilities.

With the improvements introduced during this period, as described above, Spain may be said to have improved its degree of compliance with the requirements established in this article relating to the licensee responsability.

c) General Considerations in relation to Nuclear Safety

Article 10. Safety Priority

10.1 Main Activities performed during the Period by the Licensee in relation to Safety Culture

Safety Culture is one of the working areas to which special attention is paid within the respective "Organisation and Human Factor Safety Assessment and Improvement Programmes", issued by Spanish nuclear power plants since 2000 and continuously revised and updated by each plant since their publication. So much so that the persons responsible for Organisation and Human Factors, recognising the convenience of joining criteria and forces in the treatment of Safety Culture issues, undertook the drafting of a guide that, collecting common approaches and criteria, allowed devising a Safety Culture Programme regulating the management of actions aimed at improving attitudes and behaviours related to safety issues. This Guide was published in September 2005 by Unesa with the title "Document for devising a Safety Culture Programme", and reference CEN-12, and reflected the state of the art that appeared in the IAEA's documentation at that time.

Said Programmes allow having a mechanism that integrates and systematises the activities undertaken in both the development of the continuous improvement of Safety Culture and its subsequent assessment such that the continuity of the efforts devoted is ensured in the future. In this sense, these programmes envisage activities for assessing their implementation both by independent external assessors and through internal assessments carried out by the plants themselves.

- Independent External Assessments

  During this period and as a continuation of the assessments performed at Santa María de Garoña NPP (2000) and Ascó NPP (2002), the assessments corresponding to Cofrentes NPP (2003), Trillo NPP (2004), Vandellós II NPP (2005 and 2006) and Almaraz NPP (2006) were carried out within the framework of the IOS (Impact of the Organisation on Safety) Project, in which Unesa, the Ciemat and the CSN collaborated. All of these external assessments were handled by the same external assessor, Human Performance Analysis Corporation, using a methodology based on the "Canadian Adaptive Machine Model (CAMM)", developed in part by Doctor S. Haber in collaboration with the NRC and Brookhaven National Laboratory (BNL); Spanish researchers from the Ciemat took part in the assessments.

- Internal Assessments

  In accordance with their respective Safety Culture Programmes, the first internal assessments of Spanish nuclear power plants to verify the development and effectiveness of the implementation of their Programmes have been carried out during 2006 by Santa María de Garoña NPP, Ascó NPP, Vandellós II NPP and Cofrentes NPP. Trillo NPP started its assessment at the end of 2006 and will complete it in 2007. Almaraz NPP will conduct its assessment in 2008.

All Spanish nuclear power plants have set in motion plans that include the planning of the initiatives that have been decided in each case to try to deal with the areas for

improvement detected in both the independent external and internal assessments, which have been mentioned in the above paragraphs.

On the other hand, the External Assessments executed during the period by the IAEA's missions (OSART, PROSPER or SCART) and WANO's peer reviews are shown in table 10.1.

Table 10.1: External Assessments at Spanish Nuclear Power Plants

Plant	Assessment	Date
Almaraz	OSART (OIEA)	1987
Cofrentes	OSART (OIEA)	1990
Garoña	Peer Review (WANO)	1996
Ascó	OSART (OIEA)	1998
Vandellós II	Peer Review (WANO)	2001
Trillo	Peer Review (WANO)	2001
Almaraz	Peer Review (WANO)	2002
Garoña	OSART (OIEA)	2002
Cofrentes	Peer Review (WANO)	2003
Ascó	Peer Review (WANO)	2005
Garoña	PROSPER (OIEA)	2005

The follow up visit to the Cofrentes NPP peer review conducted by WANO in December 2003 took place from the 24th to the 28th of October of 2005 to check the state of implementation of the actions proposed for solving the areas for improvement (AFIs) detected. The result has been defined as very satisfactory by WANO; 3 out of every 4 AFIs having been positively rated ("A: definitively solved" or "B: being solved"), and no AFIs have been found that have not improved.

The Ascó NPP peer review took place from 14th November to 2nd December 2005. As a result, areas for improvement and good practices were identified (which will be published by WANO) in the different areas that comprise an assessment of this type: Operation, Training and Qualification, Maintenance, Work Management, Engineering, Documentation Control, State of the Equipment, Radiation Protection, Fire Protection, Chemistry, Operational Experience, Prevention, Organisation and Administration, Human Performance, and Organisational Effectiveness. WANO's visit to monitor the degree of progress of the implementation of the actions proposed by Ascó NPP in response to the areas for improvement identified by the assessment will take place in November 2007.

The IAEA's PROSPER (Peer Review of the Operational Safety Performance Experience Review) Mission in Santa María de Garoña NPP took place in October 2005. The strong points identified in the report thereof are those aspects related to Safety Culture. Regarding this subject, it is highlighted that plant personnel show a strong commitment to the execution of their activities in accordance with these safety principles. Likewise, the workers' will to learn and improve so as to adopt the best international practices is emphasised. The following areas are identified as areas for improvement:

- Improvements in the Operational Experience Programme and Corrective Action Programme systematic and management (external assessment systematic, improvement

of assessment times, compliance with the deadlines for completing the actions, incorporation of the experiences in routine activities).

- Minor event identification and management.
- Study of equipment failure trends and of event causes.
- Extension of the access to and use of WANO and INPO information.
- Implementation of the second phase of the Self-Assessment Programme.

The implementation of these recommendations is scheduled to be complete in the first quarter of 2008.

In the near future there are WANO peer reviews planned in Trillo NPP (2007) and Almaraz NPP (2008). As for the IAEA, an OSART mission is scheduled in Vandellós II NPP (2008) and a SCART (Safety Culture Assessment Review Team) Mission in Santa María de Garoña NPP (2007).

10.2 Regulatory Control of Licensee Activities

One of the CSN's expectations is that nuclear power plant licensees develop integrated management systems including safety management. These expectations have already turned into specific requirements in nuclear power plants that showed significant safety management deficiencies. For both these and the other plants the CSN is monitoring the development of integrated management systems by licensees, as described in the previous Section, and supervising their implementation.

The CSN is kept informed at all times of licensees' initiatives regarding safety culture maintenance and improvement in the organisations as well as of the self-assessment activities performed. During this period the CSN has monitored these issues more intensely through inspections included in the Basic Inspection Programme and meetings with licensees in relation to both technical and management issues. Refer to Section 9.2 for more details.

Furthermore, the CSN is currently implementing in Spain the IAEA's GS-R-3 "The Management System for Facilities and Activities", which introduces a series of new requirements. In turn, this will entail the issuance of requirements by the CSN and the devising of a programme for their implementation at the plants, as well as the supervision of their correct implementation.

On the other hand, the CSN has implemented the Integrated Plant Supervision System (SISC), which applies to plants in operation, since 2006, as stated in Section 19.4 of this report. This new system aims at increasing the regulatory intervention with the finding of deficiencies.

10.3 Degree of Compliance with the Obligations of the Convention

As was indicated in previous National Reports, Spain meets the requirements of the Convention since all actions taken by licensees fulfil the principle of giving priority to nuclear safety. Furthermore, the CSN continuously and systematically analyses the licensee activities, which enables them to verify that the aforementioned principle is satisfied. With the modifications made during this period and described in the previous paragraphs, Spain may be said to have improved its degree of compliance with the requirements of this article.

Article 11. Financial and human resources

11.1 Significant changes occurred during this period as regards Licensee's financial and human resources

During the period covered by this report, the efficiency in all spheres and levels, and evidently the operational efficiency of the organisations, has been maintained as one of the operational standards, taking into account both human and financial capitals.

In accordance with document "Studies on the technical capability and minimum staffing of the organisation", all Spanish nuclear power plants have followed the guidelines set therein as regards the requirements for technical capabilities and minimum staffing of the departments of each organisation in order to ensure, firstly, that operation is conducted in a safe and reliable manner, and secondly, that each organisation is capable of retaining the explicit and tacit knowledge necessary to keep itself within the achieved efficiency parameters. This has been particularly important and has required great efforts in Organisations that have undergone significant changes due to both the permanent cessation of the plant operation or inevitable generational changes.

These processes of change have been faced and undertaken first of all by the organisations' Management, which has promoted the design of training processes and overlapping periods appropriate for each specific situation. Time has proven the effectiveness of the processes carried out in all the cases in which significant changes have taken place.

In connection with the investments in safety by operators, Spanish nuclear power plants defined the criteria of application of the Investment Procedure Guides such that a common systematics was created so as to ensure that investment decisions do not entail a reduction in nuclear safety and radiation protection in the installations. On this basis, they have developed procedures, based on Unesa's document "Guideline for the Planning of Safety related investments", which are an important part of the Integrated Safety Management System, which has been implemented in all Spanish nuclear power plants, and according to the Strategic Plans of each plant, with the intention of:

- Detecting investment needs,
- Prioritising according to the importance of the changes,
- Planning and assigning resources,
- Including follow up and control mechanisms.

The process of planning investments related to nuclear safety is a fundamental part of the integrated safety management system and is directly derived from the action management systems, from which the actions to be implemented are identified. This system aims to ensure that all potential investment needs are detected and receive proper attention, any unit of the organisation being capable of proposing actions having new investments implicit. In order to prioritise them, they are classified according to the following: 1) Requirements by the Regulatory Authorities, 2) Improvement of nuclear safety, radiation protection, risk prevention, and environmental protection, 3) Technological Updating or Improvement of the plant, and 4) Profitability.

The detection of new investment requirements to keep the plant updated in terms of safety, regulations, and technology, arises from the regulatory requirements; the programme of corrective and improvement actions identified as a result of the analysis of in-house and industry operating experience; audits; external assessments; obsolescences; technological evolution; and strategic long-term assets management plans.

11.2 Significant changes occurred during this period in the Licensee's personnel training programmes

In the wake of the CSN's decision to require training simulators for the operating personnel of all Spanish nuclear power plants, the latter have made important efforts to adapt to the new established framework. Currently, all Spanish nuclear power plants already have full scope simulators, which are being used or have been used –as is the case of José Cabrera nuclear power plant until its final permanent cessation of the operation on April 2006– for the initial training of new licensed staff and for the continuous training of personnel with license in force. They are also being specifically used as support for plant operation in issues such as the validation of operating procedures; the analysis of some events; training prior to the performance of certain tests and manoeuvres; and the validation of design modifications and the training of operators in advance of their implementation in the control room. Likewise, simulators are being used as a complement to the initial and continuous training for managerial staff, CSN personnel, simulator instructors, engineering staff, and maintenance personnel.

As far as training programmes for licensed operations personnel are concerned, the CSN has drawn up a CSN regulatory Instruction, IS 11, in which the requirements for the personnel with a nuclear power plant operator or supervisor license are established, being under revision the Safety Guide 1.1 on "Qualification for acquisition and use of Nuclear Power Plant Operating licenses personnel". A "bank of questions and answers", both generic and specific of each plant, has been being developed as an aid for preparing the tests to obtain the operator or supervisor license.

With regard to José Cabrera nuclear power plant, the permanent cessation of plant operation took place on April 2006, at the end of the period of validity of the operating permit in force. Consequently, this plant has created the Room Operator figure, with the function of operating all panels, equipment, and systems of the plant under the guidance of the shift supervisor, writing for this purpose initial training and retraining procedures specific for this collective based on the aforementioned Instruction and Safety Guide, although adapting its contents to the new situation of the installation.

As regards the training of the rest of the staff, the CSN has approved during this period a new CSN Instruction, IS 12, in which the qualification and training requirements for the rest of the non-licensed personnel of nuclear power plants, including the staff belonging to external companies, are established. On the other hand, the plants have consolidated the development and application of Guide CEX-37 Rev. 8, "Guideline on qualification, initial and on-going training, and experience of non-licensed Nuclear Power Plant Personnel" delivering the programmes during the initial and continuous training of the staff. This Guide was developed by the electricity sector and accepted by the CSN after a period of discussion. After its permanent cessation, José Cabrera nuclear power plant has continued using Guide CEX-37 as a reference for devising training plans for this collective, although adapting its contents to the new situation of the facility.

The nuclear sector has made an effort to integrate on-the-job training and to achieve a greater involvement of the line management, which may help to detect training needs and to improve the transfer of knowledge, in particular when personnel changes take place. Certain improvements have been made in the training procedures, with a view to of

ensuring the achievement of the learning objectives, among which the following may be mentioned:

- The development of new procedures regulating training activities of the licensees.
- The incorporation of actions and feedback in certain phases of the training process (analysis, design, development, delivery).
- The introduction, in certain cases, of classroom and simulator assessment tests; in this case, a group evaluation is also included.
- The adoption of corrective actions in the event of problems or inadequate training being identified.
- The review of certain aspects of the initial and continuous personnel training programmes and the incorporation therein of courses on Safety Culture, Human Factors and the Environment.
- A greater involvement of plant staff in preparing and imparting contents specific to their competence.
- The figure of tutor in the initial training of new operators is being used to give them individual technical support to overcome possible personal problems.
- Instructors specialised in Human Factors have been incorporated in the simulator sessions corresponding to initial training, and in some cases continuous training, in order to promote the desired attitudes and behaviours in operators and supervisors.
- Significant improvements relating to educational means have been introduced.

On the other hand, as a project under test and conducted by Unesa, a Human Factor simulator has been designed in which validation sessions have been carried out with participation of personnel of different categories from all Spanish nuclear power plants.

As far as Radiation Protection training applicable to outside workers is concerned, the provisions of the CSN Instruction IS-06, which defines the basic and specific training programmes in said area, have been consolidated as common practice.

The CSN has set up a working group whose activities are now under way and whose mission is to analyse the management of external companies, within the scope of the provision of services to the nuclear industry. Part of the working group scope is to study the selection, qualification, and training of contractor companies and their workers.

The CSN maintains its programme of two-yearly Inspections of the training courses for licensee or external companies licensed a non-licensed personnel rendering services to nuclear facilities. Conducting said Inspection programme allows maintaining a high degree of confidence on licensee activities on training matters.

In order to systematise and homogenise these inspections, the CSN has recently approved a procedure in which the guidelines to be followed for the execution thereof are set.

11.3 Regulatory supervision of the Licensee's financial and human aspects

As has been already indicated in Sections 9 and 10 of this report, the nuclear power plants have introduced integrated management systems being safety one of their essential components. As it has been previously mentioned, the CSN is currently dealing with the task of implementing in Spain the IAEA's Requirement GS-R-3 "The Management System for Facilities and Activities", which introduces a series of new requirements, including those relating to financial and organisational aspects. In turn, this will entail the issuance of requirements by the CSN and the devising of a program for their implementation in the plants as well as the supervision of their correct implementation.

Both human resource management and safety investments are fundamental processes of the integrated management system. For this reason, the CSN's regulatory control on both aspects is following a strategy based on guaranteeing that those processes indeed exist and are integrated in the management system and, secondly, that they are systematically put into practice by specialists according to internationally accepted standards. In order to ensure this strategy, the CSN has made use of meetings and discussions with licensees at all levels, evaluating their technical proposals, of inspections and, even in some specific cases, of requirements associated with the operating license. Likewise, in order to address these issues with a greater guarantee of success, attempts are being made to provide the organisations, the licensee and the CSN, with specialists in disciplines that to date were not part of the classical body of knowledge available in the organisations.

11.4 Degree of Compliance with the Obligations of the Convention

The CSN's surveillance and control role and the principle of operator liability ensure the availability of resources guaranteeing the safe operation of the facilities.

On the other hand, the CSN is currently dealing with the task of implementing in Spain the IAEA's GS-R-3 "The Management System for Facilities and Activities", which has a level of requirement with regulatory power; this will cause a marked improvement as regards the financial and human resources applicable to nuclear facilities.

Article 12. Human Factors

12.1 Significant Licensee activities during the period

Within the framework of safety improvements in organisation and human factors, and as was indicated in previous reports, the CSN sent to the licensees a detailed document on the considerations to be taken into account in preparing an Organisation and Human Factors programme. Using it as a basis, Spanish nuclear power plants have edited their programmes and adapted their organisations to putting them into practice.

During the period covered by this Report, the CSN has made inspection visits to all the plants in order to check the degree of detail of the implementation of the Organisation and Human Factors programmes and the progress thereof.

On the other hand, the contacts between CSN representatives and specialists from Spanish nuclear power plants have continued in order to promote and facilitate the coordinated development of the Spanish nuclear power plants Organisation and Human Factors programmes, as well as to maintain a form for the exchange of experiences between specialists in this discipline.

Some of the main activities in the Organisation and Human Factors area have been the following:

- To discuss the CNS's inspection procedure (PT-IV-224) associated with the supervision model (Integrated Plant Supervision System) (SISC).
- To train Human Factor specialists in disciplines related to their tasks.
- To continue with the research project on the Impact of the Organisation on Safety.
- To develop a Human Factor simulator.

On the other hand, the nuclear power plant integration process, initiated after the deregulation of the Spanish electricity industry, continues. This process has significant implications for organisational aspects: the establishment of common policies and strategies; modifications of organisational structures; the exchange of experiences; the unification of practices and procedures; the optimisation of workforces; the contracting of new personnel; the management of knowledge, etc.

12.2 Regulatory control of Licensee activities

As regards organisational aspects, the CSN has a specific group of technicians in charge of issues relating to human factors since 1990. The role of the regulatory body is similar in this area to its role in other specialties. The CSN monitors the requirements and standards related to human and organisational factors issued in the country of origin of the design, and the international practices, adapting its standards and regulatory practices; it is the responsibility of the operator to carry out the actions required to meet the applicable requirements, and the CSN's function to evaluate these actions in order to ensure that they are adequate. Regarding this subject, the CSN has continued its evaluation and inspection tasks during this period.

In addition, the CSN is promoting in these fields the organisation, occupability and initiative of the licensees themselves in order to undertake safety improvement projects. That is, apart from the conventional regulatory control of the results from specific human

and organisational factor projects, the CSN is promoting the essential initiative of the licensee to identify by itself, within the framework of a systematic programme, the improvement projects in these disciplines: improvements in organisational efficiency, human behaviour, self-assessment and knowledge management, of work and task, etc. In short, the tracking of this licensee programme, that is, the regulatory control aimed at licensee processes, is becoming an additional or complementary approach –deemed highly appropriate by the CSN– in the field of human and organisational factors.

It is to be highlighted that in 2006 the CSN completed and approved the procedure that regulates the inspections on the state of implementation of the programmes for assessing and improving safety in Organisation and Human Factors, inspections that fall within the basic inspection plan of the CNS's SISC. During the period covered by this report, the CSN has made inspection visits to all plants in order to check the degree of detail of the implementation of said programmes.

During this period, one of the actions that has required more effort on the part of the CSN in the field of human and organisational factors has been related to the assessment, inspection and monitoring of ANAV's Safety Management Improvement Plan, as well as to the appraisal of the applicability analyses carried out by the licensees of the other Spanish nuclear power plants. The licensees to solve the organisational and managerial deficiencies identified from the August 2004 event are implementing ANAV's Plan.

Additionally, within the framework the Technical Instruction that required independent, external safety culture assessments, the support documentation referenced by the licensee, and more specifically the documentation of the external plant safety culture assessments and the associated action plans, has been reviewed by the CSN; inspections have been undertaken throughout 2006.

Likewise, during this period the CSN has continued promotions and leading, in collaboration with Spanish nuclear power plant licensees, R&D projects in which both organisations share a common interest, such as those described in the previous section.

12.3 Degree of Compliance with the Obligations of the Convention

With the boost of the CSN and the cooperation of the licensees, Organisation and Human Factor safety assessment and improvement programmes have been developed and are being introduced in nuclear installations. The licensees must be the first ones to contribute to and be responsible for achieving the objectives of such programmes; a proactive attitude towards the improvement of safety in these disciplines is sought at all times. Additionally, a significant effort has been made during this period to improve the deficiencies in organisational and managerial aspects revealed after the essentials service water system event (EF) at Vandellós II NPP and to draw learnt lessons for the Spanish nuclear industry; at the same time an effort, although somewhat slighter, has been maintained in R&D projects. Taking all the above into account, it is deemed that the obligations of the Convention are being satisfactorily met.

Article 13. Quality Assurance

13.1 Significant Licensee activities carried out during the period in relation to quality systems

Of all Quality Management activities carried out during the period object of analysis, the following must be highlighted:

- Adaptation of Spanish nuclear power plant procedures for conducting self-assessments and management of the corrective actions derived from both the self-assessments and internal or external assessments, etc., following the objectives and criteria of the corresponding Guidelines developed by the Electricity Sector: "Document for the Preparation of the Self-Assessment Program", Unesa CEN-14, Rev. 0, October 2005, and "Document for the Preparation of the Corrective Action Program", Unesa CEN-13, Rev. 2, May 2006.
- Generation of an integrated Database for the management and control of all corrective actions identified, adapting and updating the methodology of the aforementioned Guidelines.

  Categorisation and prioritisation of failures to comply and their Derived Actions. Adapting their treatment to the defined criteria.
- Generation and launch of a system for managing events derived from the execution of routine activities, in parallel to the above categorisation and of a lower level.

  The corresponding procedure for the assessment and analysis of trends, when applicable, has been issued.
- Training of NPP staff in the Corrective Action Management and Self-Assessment System implemented, derived from the modifications pointed out.
- Analysis of the criteria of the Regulatory Body's (CSN) Integrated Nuclear Power Plant Supervision System (SISC) and application thereof during the internal assessments conducted at the NPPs.
- In the last year, the Equipment and Service supplier qualification subgroup of Unesa's Nuclear Energy Committee has given a boost to the pooling for conducting the homologation of plant suppliers in an integrated manner. Efforts have been coordinated and programs have been established for its execution.
- The CSN has collaborated in the Project set up by Unesa for the practical implementation of the new validation requirements for non-destructive examination (NDE) Techniques used in the in-service inspections of NPP component, established in Unesa's Methodology CEX-120. To this end, there have been interactions with the groups in charge of said Project: GRUVAL (NDE-ISI Validation Group) and GROIV (Group of Independent Validation Organisations).

13.2 Regulatory control of Licensee activities

Changes in regulatory provisions

Over last three years there have been no changes in the regulatory provisions affecting quality assurance requirements.

Changes in operating permits

Over last three years there have been no modifications to the operating licenses for nuclear facilities that modify the notion of Quality Assurance manuals as being binding, official operating documents.

Control Activities

The assessment and inspection activities performed by the CSN follow the systematic approach and pursue objectives similar to those of previous years, trying at the same time to reconcile the application of the required quality requirements with the efficiency of the organisations. Special emphasis continues to be placed on monitoring the results of the changes in licensee organisations, especially those relating to quality assurance and management.

The CSN is also placing emphasis on activities related to the control of nuclear power plant suppliers in such a way that through inspection and assessment activities:

- In depth knowledge of the plant processes for the evaluation of suppliers, the awarding of the contracts and the acceptance of supplied items and services is achieved.
- The efficiency of the plant mechanisms for identifying and correcting deviations in processes that might give rise to deficiencies in the quality of the items and services supplied by contractors is analysed.
- The knowledge and training of the plant personnel that take part in any of the stage of a supply is analysed to determine their adequacy for selecting the most suitable suppliers and for controlling the items and services supplied.

13.3 Degree of Compliance with the Obligations of the Convention

Spain is considered to meet the requirements of Article 13 of the Convention for the following reasons:

- Currently Spanish legislation, through the Regulation governing Nuclear and Radioactive Facilities, of 31st December 1999, requires that quality assurance programmes applicable to all activities of significance for the nuclear safety of these facilities be established throughout their lifetime of nuclear facilities and for any modification thereof.
- By means of its assessment and inspection activities, the CSN verifies the compliance of the programmes with the applicable standards and checks their implementation and effectiveness.
- In order to facilitate the implementation of quality assurance programmes, the CSN draws up safety guides and updates them in keeping with new international trends in this area.
- The CSN undertakes the monitoring of trends in quality issuance in order to assess and control their application at Spanish nuclear facilities.

Article 14. Safety Assessment and supervision

14.1 Introduction

Nuclear Power Plant Operating Permits are granted by the competent Ministry (currently, the Ministry of Industry, Tourism and Trade), following a preceptive and binding report by the CSN with regard to nuclear safety and radiation protection. The current practice is that the operating permits are renewed for a ten-year validity period, coinciding with the carrying out of a Periodic Safety Review (PSR).

These operating permits follow the same model in all cases, and establish limits and conditions that the plant is obliged to fulfil (refer to Appendix 19.A). Some of these conditions are to be met immediately whereas others have a fixed term for compliance. Each permit identifies the revision in force of the official operating documents based on which the permit is issued (Safety Analysis, Operating Manual, Operating Technical Specifications, Emergency Plan, Quality Assurance Manual, Radiation Protection Manual and Radioactive Waste Management Plan). Modifications to the Operating Manual, Technical Specifications or Emergency Plan must be approved by the Ministry, following a report by the CSN, whereas the changes to the Safety Analysis Report only require approval if they are associated to a design modification that requires approval.

Design modifications or modifications to the operating conditions affecting nuclear safety or radiation protection, as well as testing, may require an express authorisation. The Regulation on Nuclear and Radioactive Facility in force includes the need to carry out a prior analysis to ensure if, once this change has been incorporated, the criteria, standards, and conditions on which the original permit is based are still met. If these requirements are affected by the design modification, the licensee must request an authorisation for this modification prior to its entry into service. On the other hand, if they are not affected, the modification may be carried out by the licensee, with the only requirement of providing information on the state of its execution.

Furthermore, the periodic or non-periodic reports that must be submitted to the CSN are defined in each permit. These reports are evaluated or supervised, as the case may be, by the CSN, giving rise to meetings, inspections, and audits with the facility licensee, as applicable. A condition included in each permit develops the faculty bestowed by law upon the CSN to directly send complementary technical instructions to the licensee to ensure the maintenance of the safety conditions and requirements of the facility and better fulfilment of the requirements established in each permit.

During the process of permit renewal, the licensee must prove that it has met all requirements of the previous authorisation. For its part, the CSN carries out a detailed assessment of the status of the plant and of the compliance with the conditions, which is reflected in the technical report proposal that serves as a basis for granting the corresponding permit.

14.2 Modifications to the system for assessment and verification of safety performed by the Licensee during this period

As indicated in Section 13.1, Spanish nuclear power plant licensees have developed a set of common criteria on self-assessment processes to be used in their organisations. These criteria, accepted by the CSN, have been used to review the specific procedures of each

plant and to subject their application to a test period after which they will be reviewed on the basis of the lessons learned. This activity is complemented with the adoption of a set of common criteria on which the programmes for the establishment of corrective actions are based and prioritised according to the safety significance thereof.

During the period covered by this report, the safety verification processes carried out by the CSN have undergone a significant change and the Spanish nuclear power plants had to adapt their processes to this new system, known as the Integrated Plant Supervision System (SISC-Sistema Integrado de Supervisión de Centrales), with the corresponding commitment of resources. Said adaptation has been necessary to facilitate CSN's surveillance and control work by systematically providing information for the new performance indicators and for the preparation of the inspections in order to achieve maximum efficiency. The collaboration of the licensees and the CSN in defining the new supervision process has facilitated carrying out the activities needed for adapting the plants to the new system.

All Spanish nuclear power plants have performed at least one Periodic Safety Review (PSR). Said review is carried out every ten years and must be submitted to the Administration as part of the support documentation for the Operating Permit validity renewal request. In general, the request has to be made one year before the expiration of the permit.

In the particular case of Santa María de Garoña NPP, said request has been submitted three years in advance of the expiration of the Operating Permit since the analyses required for the long-term operation (they are described at the end of this Section) are included in this request and the current license of Santa María de Garoña NPP expires in July 2009. In the very near future, Almaraz NPP will also carry out and submit a new PSR since the expiration of the validity period of its Operating Permit is near. Finally, José Cabrera NPP ceased its operation on April 30TH, 2006, date on which the validity period of its Operating Permit ended.

During this period, the operating permit of Trillo NPP has been renewed (in 2004).

The PSR does not intend to replace the analysis, control, and surveillance practices continuously conducted at the plants but to think about the process applied and to assess its results and the corresponding safety improvements made at the plant throughout the period covered by the permit, taking into account the latest status of the plant, its equipment and components and the new safety requirements, both Spanish and of the country of origin of the technology, that would be applicable according to its design and the date of its original operating license.

With regard to Probabilistic Safety Assessment (PSAs), the application of the Integrated Programme issued by the CSN in 1986 and revised in 1998 has been carried on. In accordance with its contents, a pilot project was carried out at the time to assess the risks associated with radioactive sources other than the reactor core, using Cofrentes nuclear power plant as pilot plant. Its results proved that the only radioactive source worthy of being analysed in each plant due to its contribution to risk is the spent fuel pool. Thus the plants have limited the PSA of other sources to said pool in the context of the PSA in Other Modes. Cofrentes NPP submitted its PSA in Other Modes in November 2004, and Almaraz NPP and Trillo NPP submitted their PSAs in Other Modes and of others sources in December 2004 and December 2005 respectively. In the period corresponding to this report, the plants have been maintaining and updating their PSAs in accordance with the CSN Safety Guide (GS 1.15).

Likewise, during this period, Spanish nuclear power plant licensees have continued to perform different Probabilistic Safety Assessment (PSA) applications in support of their

licensing and safety improvement processes. These applications have consisted of the performance and presentation of various risk-informed modifications, among which those related to the Risk Monitor, the extension of the inoperability time of some components required in the Technical Specifications or in the In-Service Inspection and Testing practices, as well as prioritisation of valves (MOV and AOV) and maintenance activities during power operation, may be mentioned. These types of requests started throughout the years 2000 and 2001, after an analysis and application methodology derived from that followed by the NRC was adapted in each case. Nowadays, the guidelines included in the CSN Safety Guide 1.14 are followed.

Article 81 of the Nuclear and Radioactive Facilities Regulations, approved in 1999, introduced the possibility of requesting from the CSN a favourable appreciation of new designs, methodologies, protocols, etc., the concession of which may be included as a reference in other subsequent authorisation processes. Under the protection of said article, Spanish nuclear power plant licensees, through the Spanish Electricity Industry Association (Unesa), have developed generic models and procedures, the favourable appraisal of which has been requested by UNESA to the CSN. The objective of this process is to speed up the processes for assessing requests for licence renewal that the plants might individually require, as well as to optimise the resources necessary therefor. The use of this licensing process has led Unesa to obtain several favourable appraisals from the CSN, such as:

- Procedures for the radiological clearance of several materials of low radioactive content, such as scrap, used oils, resins and activated carbon. Both Almaraz NPP and Trillo NPP have had material clearance authorisations before the period covered by this report.
- A methodology for validating Non-Destructive Testing (NDT) systems used during the in-service inspection.
- A guideline for the implementation of digital systems in nuclear power plants.

Even though no new favourable appraisal requests have been initiated during the period covered by this report, the previous three have been applied. Particularly relevant is the use of the Digital System Implementation Guide, which has been used in several design modifications (e.g. of Feedwater Turbine Driven Pump Control, the Core Supervision and Monitoring System and the 380V Safety Switches at Almaraz NPP, the New Switches and Nuclear Calculation Computer at Trillo NPP and the Nuclear Instrumentation Digitalisation at Cofrentes NPP), as well as in the application of the application of the non-destructive examination technique validation methodology (e.g. to the inspection of fuel assembly pins at Trillo NPP).

The control of ageing as a fundamental element of Lifetime Management is reflected in the regulatory requirements imposed on plant operation through the preparation, as a condition of the Operating Permit, of a report on the monitoring of the ageing and degradation mechanisms of safety-related structures, systems, and components and on the state thereof, and wherein the new inspection, surveillance and maintenance activities incorporated to detect these mechanisms and to control their effects, which the licensee will annually send to the Directorate General for Energy Policy and Mines of the Ministry of Industry, Tourism and Trade and to the CSN. Said Plant Lifetime Management Plans are based on the LWR Nuclear Power Plant Remaining Lifetime Assessment System developed by all the Spanish nuclear power plants associated under Unesa and which is described in greater detail in Section 18.1. Additionally, the licensees have carried out a specific assessment of the possible degradation mechanisms of the structures, systems, and components that may affect the safety of the plant, in accordance with that requested by the CSN in connection with the event that took place at Vandellós II NPP in the

essential service water system in August 2004. The conclusions from said assessments have been incorporated in the Lifetime Management Plans of the plants.

Finally, it should be pointed out that the licensees have been devoting great efforts to clarify the licensing process that will govern the renewal of the Operating Permit when the granting thereof extends plant lifetime beyond the time contemplated in the original design. In Spain there is no regulation that sets the service lifetime of nuclear power plants, which do not currently have any fixed period established. The period of validity of their Operating Permit is periodically renewed by means of a continuous assessment and the Periodic Safety Reviews (PSR).

The Periodic Safety Review is the basic tool for awarding a long-term operating permit. The application of the permit renewal process after carrying out a PSR, in which the performance of the facility in previous years is analysed as a reasonable guarantee that the safety conditions will be maintained during the following period, also seems to be appropriate in the case that a long-term operation is requested.

A new element, which is the object of analysis, is included in the new cycle of periodic safety reviews. It is the analysis of "Regulations of Conditional Application ", which are the regulations whose basic applicability parameters (in design or operation, type of plant, and date of construction or commissioning), as expressed in the regulation, do not coincide with those of the plant which is being considered, so that their eventual, total or partial, application is conditional to a prior selection by the CSN and to the carrying out by the licensee of a study of the improvements it could entail.

14.3 CSN supervision activities and results obtained

It was already mentioned in the previous reports that, due the characteristics of the permits and authorisation granting system followed in Spain, the regulatory body has carried out a direct follow-up and a continuous assessment of the operation of the plants since the beginning of their operation.

Another supervision instrument is the Basic Inspection Programme, which, as described in Article 19.3, has a validity of two years and is applied equally to all facilities. Both specialists from the CSN head offices and the inspectors resident at the sites (two inspectors per site), who track daily the operation of the plant and its incidents, supervising how operating incidents are solved, and the compliance with the Technical Specifications, or other CSN requirements, take part in carrying out the Inspections of this programme. The Basic Inspection Programme includes functional Inspections of selected systems, selected based on their significance for the risk of the facility, in which specialists in various disciplines participate.

During this period the CSN has devoted significant effort to this programme, as regards both inspection and the evaluation of the results and categorisation of the findings of these Inspections according to their impact on risk, for which reason the steps and programming required to adapt an integral and systematic supervision programme similar to that applied by the USNRC have been initiated during the period covered by this report, as described in Article 19 below.

As regards the review of the safety system design bases, each plant established a programme for its implementation and has submitted the results thereof to the CSN, along with the a review of the corresponding Safety Analysis Report (FSAR) in which these Design Bases are reflected. The CSN has assessed in detail these design base review programmes and accepted both the process for carrying them out and their conclusions in two of the Spanish nuclear power plants; other four plants were required an extension of the scope and specific modifications in their preparation process. At the closing date

of this report the completion of this process is pending in Ascó and Vandellós II nuclear power plants. The current schedule of these activities extends to the end of 2008 for its completion.

Additionally, as was already indicated in previous reports, in December 2003 a process reengineering project was started in which a set of activities to improve the effectiveness and efficiency of the CSN was identified focusing on the CSN's key processes. To this end, as a result of the corresponding Action Plan, some modifications in the CSN's existing practices have been incorporated to these processes. This reengineering project is in line with current trends of public administrations aimed at recognising the need to change the way of interacting with stakeholder groups, increasing the quality of its services and reducing response times. With this project, the CSN considers optimising its services, reducing its response periods and acting with greater flexibility, which in turn gives the opportunity to examine the operation of the regulatory body, focusing on the results and eliminating everything that does not provide an added value.

One consequence of this process has been the revision of the internal action procedure for assessment of the requests submitted by the licensees, incorporating not only the assessment itself but also the categorisation of the deficiencies that may be identified in this assessment process so that the licensees, apart from correcting said deficiencies, adopt the appropriate corrective measures in their own analysis and assessment processes to prevent their repetition in the future. The new revision of this procedure is in the process of internal comments prior to its final edition.

14.4 Situation of the Probabilistic Safety Assessments in this period

The CSN approved in 1986 an Integrated Probabilistic Safety Assessment Plan that required that all Spanish plants carried out a level 1 PSA. The objective was twofold; on the one hand, to carry out the PSAs of each of the Spanish plants in accordance with some basic ideas about their scheduling. In other words, the PSAs were to be performed in a staggered manner in time and scope such that, in order to achieve a common scope at all plants in the future, at least the first PSAs would need to be updated to the scope of the last. The aim was to thereby favour the use of Spanish resources and the acquisition and assimilation of the technology. Consequently, the emphasis in the text of that first edition was placed especially on the execution of PSAs. The second objective was the use of PSAs. For this reason, the applications that were foreseen from the models of the PSAs once developed were already described. The foreseen applications were to be based on the great capacity of these risk assessments to be able to discriminate the importance, or contribution, that different aspects of the design and operation of the facility have for risk.

The revision of the Integrated Plan, issued in 1998, highlights the aspect of the applications. In order to carry out applications, the CSN issued Safety Guide GS 1.14, which is currently undergoing its Revision 1. As regards the execution of the PSAs, the Integrated Plan sets a common scope for all PSAs of all plants. They will have to be level 1 and level 2 analyses for all operating modes of the reactor, not only full power operation, and must take into account all possible risks due to external events and all the other sources of radioactive products of the plant.

As a tool with a high level of detail for the analysis of the design and operation of each nuclear power plant, the PSAs are updated rather frequently in order to incorporate the design and procedural modifications. The application of PSAs to different fields requires a permanent maintenance and update process, which is known as "Live PSA". Complementary to the abovementioned GS 1.14, the CSN issued Safety Guide 1.15 to

guide the update and maintenance processes of the PSAs along the lines of the live PSA. The process for the preparation of Revision 1 of this Guide is also going to be started.

In Spain, nuclear facilities licensees have carried out levels 1 and 2 of the PSAs, including the possible internal and external events during power operation. The assessments of the studies of risks during shutdown are currently being completed.

The overall quantitative results obtained from levels 1 and 2 of internal events of the latest versions of the PSAs, expressed in terms of core damage frequency, once assessed by the CSN and consequently updated by the licensees, are displayed in the attached table.

The results from the studies which are provided below are the core damage frequencies (CDFs) and the large early release frequencies (LERFs) and large release frequencies (LRFs) in general corresponding to the internal events at power, that is, they do not include the frequency relating to internal fires and flood nor the risks due to possible events the origin of which is external to the nuclear power plant, even though these results are of the same order of magnitude.

The definitions of large early release and large release frequencies are included in Revision 2 of Safety Guide 1.12 and are the following:

LERF is the sum of the frequencies of those accidents that cause a emission of volatile fission products to the outside of the facility greater than 3% of the core inventory within the 12 hour interval from the start of the accident.

LRF is the sum of the frequencies of those accidents that cause a emission of volatiles to the outside of the facility greater than 3% of the core inventory within the 24 hour interval from the start of the accident.

Results

	CDF Frecuency (1/year)	LERF Frecuency (1/year)	LRF Frecuency (1/year)
Ascó	2,92E-5	1,41-06	2,96E-6
Vandellós	3,51E-5	3,96-07	3,96E-7
Almaraz	5,12E-6	1,35-06	1,35E-6
Cofrentes	1,27E-6	1,15-07	1,39E-7
Trillo	3,86E-6	2,40-07	2,42E-7
Garoña	1,89E-6	5,17-08	1,49E-8 (*)

From the last report, all PSAs are subject to update and maintenance processes in accordance with Safety Guide 1.15. The data previously indicated correspond to the latest versions.

The execution of level 1 PSAs entailed a greater understanding of the plants by both the operator and the CSN. Certain design modifications on very specific issues have been undertaken as a result of their execution.

* This value corresponds to volatile releases to the outside greater than 10% after 24 hours from the start of the accident. There is no data on volatile releases greater than 3% but they could be one order of magnitude greater.

In accordance with the scope established in the second edition of the integrated plan, the level 2 of all PSAs has already been carried out and assessed in the Spanish plants by the CSN.

The CSN is currently assessing the PSAs for operation modes other than the full power mode (APSOM) corresponding to the last plants to submit them, Cofrentes, Almaraz, and Trillo.

As far as PSA applications are concerned, an objective stressed by the current edition of its integrated plan, methodologies have been tested in pilot projects in collaboration with the Electricity Sector, giving rise to the preparation of Guides that have been used in the official PSA usage requests during the discussions for changes to Plant Technical Specifications, the Piping In-Service Inspection Manual or the In-Service Inspection Manual for valve and pump testing in several plants. Several applications of this type have already been assessed by the CSN, and others are currently being assessed.

Apart from PSA applications aimed at assessing requests from the licensees, as previously indicated, it is also worth mentioning that it has been decided that risk information is used for their own internal processes, for both internal use by the CSN's inspectors and the inspection itself, as well as to give support to the process started at the CSN on the Integrated Plant Supervision System (SISC). In this process, already started in 2005 and fully implemented in 2006, PSAs are used and applied both by the indicator system, such as the Mitigation System Performance Indicator (MSPI) system and in the categorisation of the inspection findings in its phase of the Significance Determination Process (SDP) in its phase 3.

Among the internal uses of PSAs, the inspection process is the first one selected and where the greatest progress has been made towards the final objective of having a risk-informed Basic Inspection Plan in their corresponding inspection procedures. One of the developed tools is the implementation of a PSA information system (PSAIS) in the CSN's intranet, where all existing PSA information is included, which is an element at the disposal of all inspectors, it being used for selecting structures, systems, and components to be inspected in accordance with their risk significance.

On the other hand, the CSN has the updated PSA models, the Risk Spectrum code being the tool used for quantifying PSAs in the aspects related to the applications thereof, including, among others and apart from the abovementioned, the accident precursor event analysis.

14.5 Results obtained from Periodic Safety Reviews

As already previously indicated, a condition included in each of the operating permit establishes that the licensees must carry out a Periodic Safety Review, and its results must be submitted together with the corresponding documentation for the operating permit renewal request. These periodic reviews do not aim to replace the analysis, control, and surveillance practices continuously carried out at the plants but to perform an overall assessment of the safety of each plant and of the possible improvements to be introduced taking into account their current state.

Among their objectives are the following:

- Ensuring that the analysis process derived from the operating experience has been correctly applied, including the overall revision of the modifications carried out as a result of generic studies.
- Analysing the overall plant performance over long periods of operation, including the results of equipment surveillance and maintenance requirements, with the idea of

verifying that plant safety levels have not decreased over said periods and of ensuring a safe operation during the following period.

- Assessing the plant safety with regard to the new requirements established by national standards, international recommendations and prescriptions in the country of origin of the project for plants of a similar design, the application of which to Spanish NPPs has been generically or specifically established by the CSN.
- Updating the status of the different assessment programmes and establishing adequate improvement programmes.

Even though there has not been a nuclear power plant in which a periodic safety review has been carried out during this period, a description is included of the results of the Periodic Safety Review of Trillo NPP, which was submitted at the end of 2003 as support documentation for the request of extension of its operating permit and the assessment of which ended after the completion of the previous report. The Periodic Safety Review of this plant covers the period from December 1988 to December 2001. Since a program for reviewing the System and Operating Experience Analysis (SOEA) was executed in this plant, which, as already described in previous reports, entailed a full check of the safety systems; therefore, no results of great significance appeared in this Periodic Safety Review. Among the results of the assessment of this documentation are worth to mention the incorporation of improvements in the integrated safety management system, in the qualification of cables located inside the containment, in the scope of the new regulation applicability analyses, in the completion of the Fire Probabilistic Safety Analyses and in the surveillance of aspects relating to the site (such as seismic monitoring and hydrogeological data). In general, it may be said that the experience of linking the execution of a Periodic Safety Review at a nuclear facility and its submittal prior to the granting of a renewal of the operating license has positive aspects of unquestionable value for the safety of the facility. The overall review of a facility over long periods of time allows assessing the operation with a complementary view to the daily follow up. The results of the Periodic Safety Review may be used to improve the operation during the following period. As a result of the execution of Periodic Safety Reviews, an update of the documentation associated with each facility has taken place; in certain cases, discrepancies have been detected between different documents and design modifications of some importance have even been carried out. A set of programs to improve some aspects affecting the safety of the facility has been established in each plant. Among these, the improvement programmes of the organisational aspects and of the human factors have received special impetus in all cases.

This same action systematics is deemed to be equally valid for those cases in which the renewal of the Operating Permit exceeds the lifetime originally considered in the initial design of the facility. In this case, it is understood that special conditions must be included, both administrative and relating to the facility aging management, such that the operation of the plant may be extended beyond the initial design lifetime. In order to address this circumstance, the publication of a revision of Safety Guide 1.10, including the recommendations to perform the Periodic Safety Reviews, is planned.

14.6 Degree of Compliance with the obligations of the Convention

In previous reports, the systematics for assessing and verifying the safety of Spanish nuclear power plants was viewed favourably, both from the standpoint of the current licensing and inspection systems and as regards their efficiency, which has allowed the problems that have been appearing to be detected and analysed. In those reports, some aspects that might be highlighted and which are still applicable were identified, and among them, the following:

- The implementation of a policy for granting operating permits for ten-year periods, preceded by a systematic check of the safety and radiation protection of the plant, has continued. Once assessed, the results of this periodic review, if they have been deemed appropriate, have been taken into account in the conditions of the new license.
- This same systematic is deemed equally valid for those cases in which the renewal of the Operating Permit exceeds the lifetime originally considered in the initial design of the facility. In this case, it is understood that special conditions must be included, both of an administrative nature and other related to the facility aging management, such that the operation of the plant may be extended beyond the initial design lifetime. In order to address this circumstance, it will be necessary to revise Safety Guide 1.10, which recommends actions to carry out the Periodic Safety Reviews.
- The boost to the Integrated Probabilistic Safety Assessment Program, its results and the use thereof in risk-informed applications entails an improvement of plant safety. The review and update of probabilistic safety studies and their application as support of risk-informed design modifications have been used in the identification and improvement of resource management and dedication in aspects important for the safety of the facility.

In short, it is considered that Spain continues to meet the requirements of this article, suitable measures having been adopted for the periodic execution of detailed and systematic safety assessments throughout the lifetime of Spanish plants. Through the Inspection Model followed, together with the supervision and assessment of the requests from each plant, a mechanism for the continuous review of operative experience and, all in all, of the safety conditions of each facility is available.

During the meeting for reviewing the third national report, Spain undertook to provide information on the maintenance of safety in the facilities in the phase of cessation of the operation.

- Once the cessation of the operation of nuclear facilities has been declared and once the permit that allowed their operation has expired, it is necessary to dismantle them and declare their decommission so as to declassify and free them from the regulatory control which they have been subject to. This final stage of the life of nuclear facility starts with a new dismantling license authorising the licensee to initiate the decontamination, equipment disassembly, structure demolition and material removal activities in order to finally allow the full or restricted release of the site of the facility.
- Maintaining safety throughout the technical and administrative process of dismantling and decommissioning nuclear facilities is based on the exercise of two of the basic functions of the regulatory control: the previous authorisation of the process and the supervision and control of the dismantling activities.
- The official documentation that supports the nuclear facility dismantling permit is included in Chapter VI of the Regulation governing Nuclear and Radioactive Facilities.
- In order to make use of the real experience obtained during previous dismantling processes, the CSN is in the process of structuring the format and content of these official documents in order to adapt them to the specific peculiarities of the dismantling process.

Article 15. Radiation Protection

15.1 Summary of Laws, regulations and requirements referring to radiation protection at nuclear power plants

The provisions of the Spanish regulations that deal with radiation protection are included fundamentally in Law 15/1980, of 22nd April, Creating the CSN and in the Regulations on Health Protection against Ionising Radiations of 6th July 2001. These provisions have not undergone any modification during the period considered in this report.

15.1.1 Law Creating the Nuclear Safety Council (CSN)

This Law assigns to this body the functions of monitoring and controlling the levels of radioactivity inside and outside nuclear power plants and their particular or accumulative incidence in the areas in which such facilities are located, of controlling the doses received by the operating personnel and of informing and advising the Government with respect to the commitments of other countries or international organisations in relation to nuclear safety and radiation protection.

15.1.2 Regulation on Health Protection against Ionising Radiations

The basic regulation for radiation protection of exposed workers and the members of the public against the risks resulting from exposure to ionising radiations are established in Royal Decree 783/2001, which approves the Regulation on Health Protection against Ionising Radiations.

This Regulation transposes to the Spanish legislation the provisions of the European Union Directive 96/29 Euratom and implements the basic recommendations of ICRP-60. Detailed information on its contents and scope was presented in the 2nd Report of the Convention on Nuclear Safety.

As an additional development of the provisions of the aforementioned Regulation, the Nuclear Safety Council has issued several binding legal provisions (CSN Instructions), regarding the procedures to follow in order to fulfil some of these provisions:

- In Instruction IS-02, revision 1, 21st April 2004, regulating the documentation on refuelling activities at nuclear power plants, the licensees are required to proceed as follows:
  - Prior to initiating the refuelling outage, they shall submit a report to the CSN including a detailed estimate of the occupational doses expected during the outage and detailed information on the dose reduction techniques to be applied with a view to fulfilling the ALARA criterion.
  - Within a three-month period following the refuelling outage they shall submit a report to the CSN including information on the occupational doses resulting from the outage, using a dose-task approach in accordance with format NEA 1 of the ISOE (International System of Occupational Exposure).

15.2 Control activities for the radiation protection of exposed workers.

15.2.1 Dose limits

The Regulation on Health Protection against Ionising Radiations establishes the following dose limits for exposed workers at nuclear power plants:

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

15.2.2 Surveillance and control of occupational exposure

For the surveillance and control of occupational exposure the nuclear power plants have their own official dosimetry services, which are specifically authorised by the CSN for the performance of this task, in accordance with article 25 of Euratom Directive 96/29. Furthermore, these dosimetry services are subject to a system of regulatory control by the CSN, based on the performance of inspections and audits and on intercomparison campaigns.

The regulatory framework for the authorisation of personal dosimetry services is defined in CSN Safety Guide 7.1 (Rev 1) dated 15th February 2006, (Technical and administrative requirements for personal dosimetry services).

The control of external doses is based on the use of thermoluminescent dosimetry systems. In addition to this official dosimetry, for the tracking of external doses received during work inside the controlled zone the nuclear power plants have direct reading electronic dosimeters fitted with optical and acoustic alarms, which provide a warning when the dose or dose rate exceeds a pre-established value.

The nuclear power plants have implemented a systematic working approach by means of which when a direct reading dosimeter is assigned to a worker, he/she is also assigned a code identifying the type of work to be performed (inspection, maintenance, etc.). This makes it possible to gain insight into the collective dose resulting from the different types of work performed at the plant and, therefore, to identify those that have the highest radiological burden (which will be priority tasks when applying dose reduction techniques with a view to complying with the ALARA criterion).

The control of internal doses is based on the use of whole body radioactivity counters, although it should be pointed out that Spanish nuclear power plants have implemented a very strict policy as regards the control of contamination in the working environment, as a result of which events implying internal contamination in excess of the established recording level (1 mSv/y) are extremely rare.

Every month the nuclear power plants submit to the CSN individualised information on the doses received by each of the workers (in-house and contracted) that have carried out their occupational activity at the plant during that period. This information is incorporated in the National Dosimetry Bank (NDB), a large database managed by the CSN and storing the official individual dosimetry history of all the professionally exposed workers in Spain. As of the end of 2006, the NDB contained the dosimetry histories of 40,418 nuclear industry workers.

15.2.3 Radiation work permits

The Spanish regulation requires that any exposed worker accessing the controlled zone of a nuclear power plant must have received specific instructions on the performance of his work, which must be in keeping with the radiological risk existing in this zone. In order to comply with these provisions, the nuclear power plants use what are known as "Radiation Work Permits" (RWP's), which are work orders containing the following:

- Description of the work to be performed and identification and limitation of the work area.
- Information on the radiological conditions in the work area.
- Indication of the estimated duration of the work.
- Maximum acceptable dose for the work.
- Personal dosimetry requirements.
- Protective clothing requirements.
- Breathing equipment requirements.
- Information on the precautions to be taken during the performance of the work.

These RWP's must be authorised by the person responsible for the plant's Radiation protection Service and, in order to ensure suitable implementation, the person responsible for performing the work covered by the RWP must sign it to accredit his awareness and understanding of the requirements established therein.

15.2.4 Specific measures adopted for contractor company personnel

Aspects relating to the radiation protection of contractor company personnel at nuclear power plants receive special attention by the CSN, since experience shows that more than 80% of the occupational doses recorded at the Spanish plants are received by such workers.

Royal Decree 413/97, of 21st March 1997, which transposes to the Spanish regulations the provisions of Euratom Directive 90/641, specifically addresses the radiation protection of contractor workers, providing as follows:

- That contractor companies:
  - Must be entered on an Official Register managed by the CSN.
  - Must provide their workers with basic training on radiation protection and control the doses received by them, keeping dosimetry records.
  - Must provide their workers with a radiological passbook and ensure that this is suitably updated.
  - Must manage the medical surveillance of their workers.
- That nuclear power plants:
  - Must ensure that any external company contracted is entered on the Official Register of the CSN.
  - Must ensure that all contractor workers have a radiation passbook accrediting that they are medically fit for the work, that they have received basic training on radiation protection and that they have an updated dosimetry history.
  - Must provide contractor workers with the specific training required for the work to be performed and supply them with protective clothing and dosimetry surveillance appropriate for this work.

– Must record the doses resulting from the activities performed in the passbook on completion of the work.

In additionally enacting the provisions of the aforementioned Royal Decree, the CSN has issued two mandatory Instructions:

- Instruction IS-01, of 31st May 2001, establishes the format and content of the radiation passbook, adapting them to the new dose limit (accumulated over five years) established in the Regulation on Health Protection against Ionising Radiations.
- Instruction IS-06, of 9th April 2002, defines basic and specific training programmes on radiation protection, as well as the requirements for instructors and training courses for contractor company workers.

15.2.5 Measures adopted to guarantee that occupational exposure to radiations is maintained within ALARA levels

The implementation of the ALARA principle is a basic objective to be achieved during nuclear power plant operation. Since the early 1990's the plants have been modifying their operating organisations in order to ensure that all their staff are seriously and formally committed to compliance with this principle.

This process, which was based on the premise that the ALARA principle is a philosophy that should be shared by the entire organisation, from upper management to those performing work, was completed at the end of the 1990's and is now fully consolidated.

In 1999 the CSN approved Safety Guide GS-1.12 (Practical application of the optimisation of radiation protection in nuclear power plant operation), which established the general framework (criteria, administrative system, responsibilities) to be considered by the nuclear power plant organisations in order to comply with the ALARA principle[1]. This Guide establishes the following criteria, among others:

- Compliance with the ALARA principle should be one of the objectives to be achieved during plant operation and in the planning of all its activities, and should be part of the plant modification and updating plans. Said document is also applicable to the nuclear power plant dismantling and decommissioning processes.
- The Management of the plant should be committed to the implementation of the ALARA principle throughout the entire lifetime of the facility, from design to decommissioning, as part of the safety culture.
- The commitment of the Management should be transferred to all the elements of the plant organisation and extended formally to external companies involved in the performance of the most radiologically significant work.
- Adequate measures should be established to inform, train and motivate plant workers regarding compliance with the ALARA principle.

Safety Guide GS-1.12 also establishes that the commitment of the plant organisation to the ALARA principle should materialise through the implementation of an ALARA programme including the following:

- Definition of the radiological indicators to be used to verify the degree of efficiency of the implementation of the ALARA principle.
- A systematic approach for the revision, from the point of view of ALARA, of the most radiologically significant tasks.

[1] This Safety Guide reflects what was a reality in the owner's organizations at the time of its publication.

- Definition of the plant policy in relation to source term reduction (decontamination, reduction of cobalt, etc.).
- A systematic approach to the revision of design modifications, from the point of view of ALARA.
- Initial and on-going training programmes specifically oriented towards implementation of the ALARA principle.
- Definition of the content and scope of the programme of internal audits to be implemented to verify the degree of implementation of the ALARA Programme.

Annex 15.A includes a summary of the occupational doses recorded at each of the Spanish nuclear power plants during 2006.

Figures 15.A.1 and 15.A.2 of Appendix 15.A show the evolution of collective doses at the Spanish nuclear power plants, compared to those registered at the plants of the different regions considered in the ISOE. This analysis underlines the fact that the situation of the Spanish nuclear power plants is comparable to that of plants of a similar design in other countries.

15.3 Control activities for the radiation protection of the population

The regulatory control of the public radiation protection is implemented through the programmes for the limitation, surveillance and control of releases from the nuclear power plants and through the environmental surveillance programmes performed in their areas of influence. The Nuclear Safety Council defines the scope and content of the releases surveillance and control programme and of the environmental radiological surveillance programme of each nuclear power plant, systematically inspecting their implementation, evaluating their results and reporting to Parliament and to the European Commission via annual reports.

15.3.1 Compliance with the conditions on the release of radioactive substances

The system for the limitation, surveillance and control of releases from nuclear power plants is based on the same principles, criteria and practices as described in the previous reports, and has led to actual releases values far lower than the authorised limits, standardised at international level.

Table 15.B.1 indicates the activity released by the nuclear power plants during 2006. The radiological impact associated with the releases is insignificant, representing the released activities only a minor fraction of the authorised limits.

The effective doses, calculated for the most exposed individual and considering highly conservative hypotheses, have in no case exceeded the limit of 100 microSievert authorised for radioactive effluents and are in all cases lower than 4 microSievert.

Table 15.B.2 shows the standardised activity of liquid and gaseous radioactive effluents from the Spanish nuclear power plants, compared to those of the European Union countries and of the United States.

15.3.2 Environmental radiation surveillance

As described in previous reports, each nuclear power plant has an Environmental Radiation surveillance Programme, drawn up in accordance with the directives of the Nuclear Safety Council, the annual schedule and results of which are evaluated by the CSN. Furthermore, the CSN carries out an annual sampling and analysis campaign around each plant, allowing the licensee's programme to be contrasted against the results.

Appendix 15.C describes the content of the environmental radiation monitoring programmes and shows the most significant results during 2005.

From the evaluation of these results it may be appreciated that the radiological impact on the surroundings of the Spanish nuclear power plants continues to be far below the limits established and that the quality of the environment in the areas surrounding the plants is maintained under acceptable conditions from the radiological point of view, without any risk for the people as a result of their operation.

15.3.3 Epidemiological Study

On its 9th December 2005 plenary session, the Spanish Parliament approved a Non-legislative Motion urging the Government to develop, through the Ministry of Health, and the Carlos III Health Institute, an epidemiological study in the areas where there are nuclear facilities and in their areas of influence (based on the wind regime, water currents, etc.), analysing the influence of these facilities on public health. Among other things, said Non-legislative Motion considered:

a) CSN participation in said studies, as far as it may be established, and specifically contributing with information allowing to assess the level of radiological exposure of the public both from artificial (derived from the nuclear facilities) and natural origin.

b) The creation of an advisory committee in which, along with institutions, independent experts, environmentalist entities and interested parties participate, for the follow up of the execution of the study and the analysis of the results obtained once the study is completed.

On 18th April 2006, the CSN and the Carlos III Health Institute (ISC-III - Instituto de Salud Carlos III) signed a cooperation agreement for drawing up an epidemiological study looking for the possible effects of the exposition to radiation resulting from the operation of nuclear facilities and radioactive facilities included in the Spanish nuclear fuel cycle on the health of the population living in the surrounding areas. In compliance with the aforementioned agreement, the deadline for completing the works is the end of February 2009. On that date the final report of the results shall be submitted.

The study to be elaborated comprises an assessment of the exposure due to the routine operation of the installations, from the beginning of the operations until 2003, devoting a special effort to reconstruct the exposure history of the populations through the monitoring of radioactive effluents and the environmental radiation monitoring in the areas surrounding the installations. It also considers exposure due to natural radiation in these areas and in two areas of the peninsula, with high and low background radiation.

The basis for the study are the municipalities in those two high and low natural radiation areas, in a 30 km radius zone, and those in the surrounding areas of the nuclear and radioactive facilities comprising the Spanish nuclear fuel cycle (within a 30 kilometre radius around those facilities), independently of their operating or dismantling situation. Other sufficiently remote municipalities with similar features will be taken as control elements.

After the aforementioned Agreement was signed, the ISC-III and the CSN started to carry out their duties in their respective scopes of competence. Activities were coordinated by means of a Joint Oversight Commission created for such purpose. Likewise, an Advisory Committee was created, comprising 26 members, in accordance with the provisions in the Non-legislative Motion.

During 2006 the CSN started the collection of the information required for reconstructing the dosimetry history of the population in the surrounding areas of the facilities, and the definition of the methodological model for estimating the doses resulting from facilities

releases and natural radiation, which concluded at the beginning of 2007. The CSN has also collected the information available needed to estimate the exposure resulting from natural radiation, and has identified, in cooperation with the Carlos III Health Institute, the municipal areas subject of the study, including those of the two areas with high and low background radiation and those beyond the area of influence of the facilities to be considered in the Study.

For its part, the ISC-III has started the elaboration of a document, similar the ones prepared by the CSN for reconstructing the doses, which describes with some level of detail the epidemiological methodology, thus completing the information reflected in the agreement itself. The Institute has started to prepare the data for the mortality analysis, which includes reading and tabulating the available mortality files.

15.4 Degree of compliance with the obligations of the Convention

In Spain, adequate measures are in place to ensure that the exposure of the workers and the public to radiations caused by a nuclear facilities under all operational situations is kept as low as is reasonably achievable and that no person is exposed to radiation doses in excess of the dose limits established.

During the period that has elapsed since the previous report, the following activities have been performed with a view to improving radiation protection at the nuclear power plants:

- The methodology and criteria to be applied in order to carry out a realistic estimation of doses on the population as a result of the operation of nuclear power plants have been defined. With such purpose, the recommendations included in the publication of the European Commission, Radiation Protection 129 «Guidance on the realistic assessment of radiation doses to members of the public due to the operation of nuclear installations under normal conditions», have been observed.
- As regards environmental radiation surveillance programmes, work continues on the analytical comparison exercises among laboratories performing environmental radioactivity measures, the objective being to guarantee the homogeneity and reliability of the results obtained from these programmes, and standardised procedures are being developed for the different stages of the measuring process.

Appendix 15.A

Information on personal dosimetry included on the CSN report to the Parliament corresponding to 2006

A. External exposure

The statistical results for accumulated dose during the year for the nuclear power plants overall are as follows:

Joint operation (normal and refuelling)

A.1 In-house personnel

A total 2018 workers have been controlled.

1. 100% of the workers controlled received doses lower than the annual limit

2. 0.40 % of the workers controlled received doses ranging between 6 mSv and 20 mSv.

3. 99.60 % of the workers controlled received doses lower than 6 mSv.

4. 92.47% of the workers controlled received doses lower than 1 mSv.

5. 71.46 % of the workers controlled did not receive any measurable dose.

If consideration is given only to workers with readings higher than the background of the dosimetry system used, the average individual dose for this group of workers amounts to 0.91 mSv.

A.2 Contracted personnel:

A total 4547 workers have been controlled.

1. 100% of the workers controlled received doses lower than the annual limit.
2. 1.58% of the workers controlled received doses ranging between 6 mSv and 20 mSv.
3. 98.42% of the workers controlled received doses lower than 6 mSv.
4. 82.16% of the workers controlled received doses lower than 1 mSv.
5. 51.95% of the workers controlled did not receive any measurable dose.

If consideration is given only to workers with readings higher than the background of the dosimetry system used, the average individual dose for this group of workers during this six-month period amounts to 1.34 mSv.

A.3. Collective doses

By way of a summary, the following table shows the annual overall collective doses for each of the nuclear power plants:

José Cabrera [2]	358	mSv.persona
Santa María de Garoña	173	mSv.persona
Almaraz I and II	989	mSv.persona (*)
Ascó I and II	596	mSv.persona (* Ascó I)
Cofrentes	646	mSv.persona
Vandellós II	266	mSv.persona
Trillo	429	mSv.persona (*)

(*) Refuelling outage

These data mean that the average collective dose per reactor throughout the year amounts to 384.13 mSv.person. By type of reactor this parameter amounts to 409.64 mSv.person for BWR plants and 376.84 mSv.person for PWR's

As reference data, figures 15.A.1. and 15.A.2. show, based on the type of reactor, comparative graphs showing the evolution of the average collective three-year period dose in Spain, Europe,

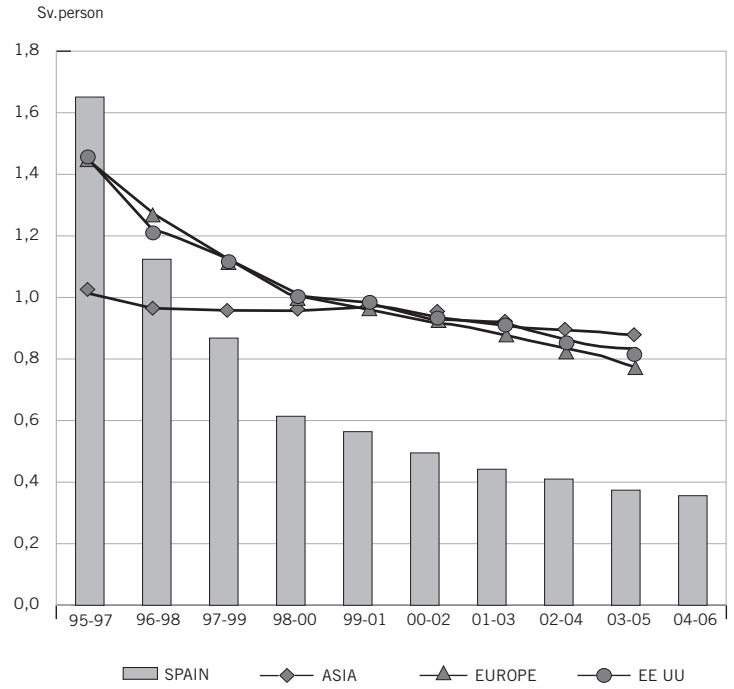
[2] José Cabrera NPP definitively ceased its operation in 30th April 2006.

Asia and North America. International data have been extracted form the database published by the International Information System on Occupational Exposure (ISOE)

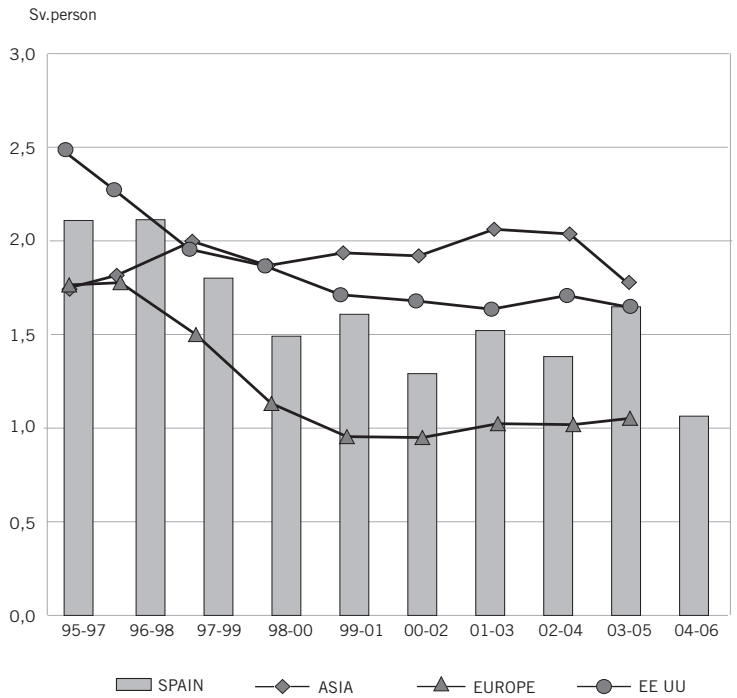
B. Internal exposure

Direct corporal radioactivity measures have been carried out on 7,701 people. In no case was any internal contamination in excess of the recording level (1 mSv/year) detected.

Figuras 15.A.1 y 15.A.2 Average collective threee-year period dose (Sv.person) for PWR and BWR type plants. International comparison



NOTE: In the production of this figure, the triennial average collective dose for PWR reactors have been considered for each compared region.



NOTE: In the production of this figure, the triennial average collective dose for BWR reactors have been considered for each compared region.

Appendix 15.B

Limitation, monitoring and control of releases of radioactive substances at Spanish nuclear power plants

The system for the limitation, monitoring and control of radioactive releases from nuclear power plants is based on the same principles, criteria and practices as were described in previous reports.

Release limits for nuclear power plants, established as an effective dose of 0.1 mSv/y for liquid and gaseous effluents overall, guarantee with an extremely wide safety margin that doses to which public individuals might be exposed to, as a result of the emission of said radioactive effluents during normal nuclear power plant operation, will not be significant and, in any case, will be clearly below the public dose limits established in the RPSRI: 1mSv/y effective dose and 50mSv/y equivalent skin dose.

As a result of the application of this system of limits on releases, the actual values of the releases continue to be far lower than the authorised limits and completely comparable to others at international level. Table 15.B.1 shows the effluents released from the Spanish nuclear power plants during 2006; the doses received by the public as a result of these releases are below 1% of the integrated limit authorised for radioactive effluents.

Table 15.B.2 shows a comparison between the releases from the Spanish nuclear power plants and their US and European counterparts. The comparison is made in terms of standardised activity per unit of energy produced (GBq/GWh).

Table 15.B.1 Radioactive effluents from nuclear power plants. Activity released in 2006 (Bq)

	PWR Plants					
	José Cabrera	Almaraz I y II	Ascó I	Ascó II	Vandellós II	Trillo
Liquid effluents						
Total except for Tritium and Dissolved Gases.	$2{,}23\ 10^{8}$	$3{,}61\ 10^{9}$	$8{,}01\ 10^{9}$	$3{,}28\ 10^{9}$	$1{,}49\ 10^{10}$	$5{,}8810^{8}$
Tritium	$1{,}12\ 10^{13}$	$4{,}59\ 10^{13}$	$1{,}97\ 10^{13}$	$3{,}16\ 10^{13}$	$2{,}81\ 10^{13}$	$1{,}83\ 10^{13}$
Dissolved Gases	$4{,}59\ 10^{7}$	LID	$2{,}72\ 10^{8}$	$7{,}30\ 10^{9}$	$1{,}18\ 10^{7}$	(1)
Gaseous effluents						
Noble Gases	$3{,}03\ 10^{12}$	$8{,}12\ 10^{11}$	$7{,}20\ 10^{10}$	$1{,}30\ 10^{13}$	$2{,}29\ 10^{10}$	$1{,}08\ 10^{11}$
Halogens	LDL	$2{,}56\ 10^{6}$	$5{,}02\ 10^{5}$	$6{,}22\ 10^{5}$	$1{,}98\ 10^{5}$	LDL
Particles	$1{,}23\ 10^{6}$	$1{,}29\ 10^{6}$	$1{,}21\ 10^{6}$	$8{,}65\ 10^{5}$	$1{,}25\ 10^{7}$	$1{,}39\ 10^{5}$
Tritium	$7{,}84\ 10^{9}$	$6{,}19\ 10^{12}$	$7{,}07\ 10^{11}$	$7{,}67\ 10^{11}$	$9{,}54\ 10^{10}$	$6{,}74\ 10^{11}$

BWR PLANTS

	Santa Mª de Garoña	Cofrentes
Liquid effluents		
Total except for Tritium and Dissolved Gases	1,50 10^{8}	6,18 10^{7}
Tritium	3,20 10^{11}	6,06 10^{11}
Dissolved Gases	LDL(2)	2,39 10^{9}
Gaseous effluents		
Noble Gases	4,38 10^{12}	3,04 10^{13}
Halógens	6,87 10^{8}	2,65 10^{10}
Particles	1,68 10^{9}	3,54 10^{9}
Tritium	6,87 10^{11}	1,13 10^{12}

(1) The liquid releases do not carry entrained dissolved gases since these are eliminated in the treatment process.
(2) LDL: Lower Detection Limit.

Table 15.B.2 Standardised activity of radioactive effluents (GBq/GWh)*

Gaseous radioactive effluents

	Spain		EU countries		USA	
Components	PWR	BWR	PWR	BWR	PWR	BWR
Noble gases	8,57 10^{0}	1,97 10^{1}	4,89 10^{0}	7,36 10^{1}	1,45 10^{1}	1,26 10^{2}
I-131	1,97 10^{-5}	6,77 10^{-5}	2,52 10^{-5}	2,75 10^{-4}	9,43 10^{-5}	4,99 10^{-4}
Partícles	2,34 10^{-5}	9,21 10^{-5}	4,22 10^{-5}	6,19 10^{-2}	3,72 10^{-4}	1,32 10^{-3}
Tritium	1,85 10-^{1}	1,36 10^{-1}	2,79 10^{-2}	3,21 10^{-2}	4,62 10^{-1}	2,80 10^{-1}

Liquid radioactive effluents

	España		Unión Europea		Estados Unidos	
Components	PWR	BWR	PWR	BWR	PWR	BWR
Total except for Tritium	3,63 10-^{3}	4,94 10^{-4}	3,97 10^{-3}	4,96 10^{-3}	7,99 10^{-3}	7,08 10^{-3}
Tritium	3,15 10^{0}	7,85 10^{-2}	3,23 10^{0}	2,50 10^{-1}	3,02 10^{0}	1,09 10^{-1}

(*) Average values: Spain: 1981-2006, EU: 1981-1997 and USA: 1981-1997

Appendix 15.C

Environmental radiological surveillance programmes in the areas of influence of Spanish nuclear power plants

Radiological surveillance in the areas surrounding the Spanish nuclear power plants is carried out through two independent programmes.

The first one, established in accordance with the directives of the Nuclear Safety Council, is carried out by the licensee of the facility in application of regulatory provisions and the conditions of the corresponding licence and is subject to regulatory control by the CSN.

The second is performed by the Nuclear Safety Council itself, in certain cases through the assignment of functions to the regional governments of the Autonomous Communities, in collaboration with national laboratories or the laboratories of universities in the region in which the installation is located. This programme is completely independent from that performed by the licensee as regards collection of samples and the laboratories carrying out analytic determinations. The sampling points, types of samples and analyses performed coincide with those of the licensees. The scope is around 5% of the programme developed at each facility.

Both programmes have continued since the publication of the previous report.

At present, eight environmental radiological surveillance programmes are implemented around the different nuclear power plants, six in operation, one in definitive operation shutdown and one in latency phase. Some 9,000 samples per year are taken within these programmes and some 12,000 analytical determinations are made.

Table 15.C.1 includes a summary of these programmes.

Table 15.C.2 includes, for illustrative purposes, the average values of the results obtained from the analysis of the air samples taken in the environmental radiological surveillance programmes during 2005.

Table 15.C.1 ERSP's performed by nuclear power plant licensees

Type of sample	Sampling frequency	Analyses performed
Air	Continuous sampling with weekly filter change	Total beta activity, Sr-90 Spectrometry γ, I-131
Direct radiatión	Change of dosimeters following a maximum exposure period of three months	Integrated dose rate
Drinking water	Fortnightly sampling or more frequent	Total beta activity, rest of beta Sr-90, Tritium, Spectrometry γ
Rain water	Monthly or more frequently for surface waters and quarterly or more often for groundwaters	Sr-90, Spectrometry γ

Table 15.C.1 ERSP's performed by nuclear power plant licensees (cont.)

Type of sample	Sampling frequency	Analyses performed
Surface and groundwaters	Monthly or more frequently for surface waters and quarterly or more often for groundwaters	Total beta activity, rest of beta, Tritium, γ Spectrometry
Soil, sediments and indicator organisms	Annual for soil and six-monthly for sediments and indicator organisms	Sr-90, γ Spectrometry
Milk and crops	Fortnightly for milk in grazing period and monthly for the rest of the year; crops in the harvest period	Sr-90, γ Spectrometry I-131
Meat, eggs, fish, seafood and honey	Six-monthly	γ Spectrometry

Table 15.C.2 Nuclear power plant ERSP's. Year 2005

	Aire Bq/m^3			
Nuclear Power Plant	ß-Total	I-131	Sr-90	Cs-137
José Cabrera	4,57E-04	LDL	LDL	LDL
Santa Mª de Garoña	4,01E-04	LDL	LDL	LDL
Almaraz	7,47E-04	LDL	6,35E-06	LDL
Ascó	6,78E-04	LDL	LDL	LDL
Cofrentes	7,63E-04	2,57E-04	LDL	LDL
Vandellós II	6,42E-04	LDL	LDL	LDL
Trillo	5,80E-04	LDL	LDL	LDL

LDL: Lower Detection Limit

Article 16. Emergency preparedness

16.1. Laws, regulations and requirements regarding planning and preparation for nuclear emergency situations

In Spain, planning and preparation for nuclear emergency situations are governed by the Basic Nuclear Emergency Plan (Plaben) and by the Regulations governing Nuclear and Radioactive Facilities. In addition, there are general provisions on nuclear emergencies in the Law Creating the CSN (as amended by the law on public prices and tariffs for services rendered by the CSN), in the Regulation on Protection against Ionising Radiations, in the Agreement of the Cabinet of Ministers on public information on healthcare measures and actions in the event of radiological emergency and in the Basic Civil Defence Standard.

The most significant aspects of the modifications introduced in the legislative and regulatory framework during this period are summarised below:

16.1.1 Basic Civil Defence Standard

The Basic Civil Defence Standard comprises, strictly speaking, the Basic Civil Protection Regulation and the Basic Self-Protection Regulation.

The first one dates from 1992, and has not been modified, whereas Royal Decree 393/2007, of 23rd March, approved the Basic Self-Protection Regulation.

The Basic Self-Protection Regulation requires the implementation self-protection plans (internal emergency plans) on any centre, establishment or facility engaged in activities that could lead to emergency situations. Nuclear and radioactive facilities, regulated by Royal Decree 1836/1999, of 3rd November, approving the Regulation governing Nuclear and Radioactive Facilities, fall within the scope of application of this Basic Regulation.

16.1.2 Basic Nuclear Emergency Plan (Plaben)

On the 25th June 2004, the Cabinet of Ministers, approved the new Basic Nuclear Emergency Plan, which updated the Plan in effect since 1989, incorporating the regulations and international recommendations for the management of nuclear emergencies, including EU Directive 96/29/Euratom and others issued by organizations such as the IAEA and the ICRP.

Objectives

The new Basic Nuclear Emergency Plan pursues three basic objectives. The first objective is to make the most of the experience acquired from the practical application of the Plan over the last twelve years, developed through public information programmes, training of the persons required to act in emergency situations and exercises and drills, as well as any incidents that have occurred during the period.

On another hand, the Plaben aims to assign certain responsibilities to the concerned Autonomous Communities and Town Councils through the effective incorporation of their services, means and resources into the Nuclear Emergency Plans. Moreover, their own competencies in areas such as medical care, fire extinguishing and rescue services,

logistics, and even, in certain cases, the integral intervention of local police have been taken into account.

Thirdly, the intention has been to make the real Master Plan out of the Plan, which means that it will be developed and implemented materially throughout the country via off-site Nuclear Emergency Plans.

Regulatory development of the Plaben

Since the last national Report on the Convention, progress has been made regarding the implementation of the Plaben in several aspects:

Regulatory development, by means of the publication of Resolution of 7th June 2005, of the Secretariat of the Ministry of the Interior, with the favourable report of the Nuclear Safety Council, whereby the following are approved:

- Guideline for prior information to the public in off-site Nuclear Emergency Plans, developing the stipulations on this matter specified in the Plaben and the Council of Ministers Agreement of 1st October 1999.
- Guideline for Training and Instruction of persons required acting in off-site Nuclear Emergency Plans.
- Guideline for exercise and drill programmes in off-site Nuclear Emergency Plans.

Approval of the master nuclear emergency plans for the areas surrounding each nuclear power plant.

Approval of the Nuclear Emergency Plan for the Response and Support Central Level.

Modification of on-site emergency plans of the nuclear power plants, to be adapted to the Basic Nuclear Emergency Plan.

16.1.3 Law Creating the CSN. Law on CSN Tariffs and Fees

As already described in previous Reports, Law 15/1980, of 22nd April 1980, whereby the CSN was created, appointed this body, among other functions, to collaborate with the competent authorities in the definition of the criteria to be met by emergency plans of the nuclear facilities and, once they have been written, to participate in the approval process.

Subsequently, Law 14/1999, of 4th May 1999, on the public tariffs and fees for services rendered by the CSN, partially modified the functions assigned to this body by Law 15/1980, including those relating to emergencies. The functions assigned to the CSN in the event of a nuclear emergency include the following:

- To collaborate with the competent authorities in the definition of the criteria to be met by off-site emergency plans of nuclear facilities and radioactive facilities and during transport operations and, once the plans are written, participate in the approval process.
- To coordinate, regarding all aspects related to nuclear safety and radiation protection, the measures of support and response in emergency situations, integrating and coordinating the different bodies and private or public companies whose intervention is required in order for the CSN fulfilling the functions assigned to this organisation.
- To perform any other activity assigned to the organisation on emergency matters by the applicable regulations.

The foregoing functions make reference to the participation of the CSN in the response to emergencies that might arise as a result of practices subject to regulatory control, such as nuclear and radioactive facilities and transport. Furthermore, Law 14/1999 appoints the

organisation with other functions related with the response to emergencies arising in activities not subject to the authorisation regime included in nuclear legislation.

16.1.4 Regulation on Nuclear and Radioactive Facilities

The Regulation on Nuclear and Radioactive Facilities continues requiring the licensees of nuclear facilities the elaboration of an on-site Emergency Plan as a pre-requisite for obtaining the corresponding Operating Permit.

This requirement has been reinforced with the approval of the Basic Self-Protection Regulation, as indicated in section 16.1.1 of this Report.

All nuclear facilities submit a proposal for the on-site Emergency Plan, which is approved by the Ministry of Industry, Tourism and Trade following a report of the CSN, which assesses such proposals taking into account specific national and international regulations.

As stipulated by the aforementioned Regulation, the on-site Emergency Plans of the facilities are required to detail the measures foreseen by the licensee to respond to accident conditions, in order to mitigate their consequences and protect the site personnel, and to notify competent bodies thereof, including the initial assessment of the circumstances and consequences of the situation. Furthermore, the licensee is explicitly required to collaborate with the competent bodies in protection activities performed offsite.

16.1.5 Agreement of the Cabinet of Ministers on public information regarding health protection measures and radiological emergency response activities

This Agreement of the Cabinet of Ministers was issued in October 1999 and replaced the previous Agreement of 1993. The new version was undertaken in order to broaden the scope of the prior information in connection with facilities other than nuclear power plants, as established in the EU Council Directive 89/618/Euratom. The scope of this Agreement of the Cabinet of Ministers now includes radioactive facilities and activities not subject to the system of authorisations foreseen in the nuclear and radiological legislation, and does not modify what was established in the previous Agreement regarding public information programmes in areas surrounding nuclear power plants, regarding both prior information and the information during the emergency, and the training of people required to intervene in nuclear emergency situations. This agreement increases the responsibilities assigned to the CSN in relation to public information on emergencies.

In addition to the foregoing, the Regulations on Health Protection against Ionising Radiations, of 6th July 2001, approved pursuant to Directive 96/29/Euratom, include the general radiation protection principles to be considered in interventions, including those relating to nuclear or radiological emergencies in general.

The provisions stipulated by this Agreement of the Cabinet of Ministers regarding prior information to the public in the surrounding areas of nuclear power plants, and training of intervening parties in nuclear emergency situations, has been recently developed and strengthened by means of the approval of the first two directives specified in section 16.1.2 of this Report.

16.2 Application of emergency preparedness measures, including the role of the regulatory body and other organisations

The Plaben, as regards practical issues of its implementation, is developed in:

- Nuclear Facility On-site Emergency Plans (PEI)

- Nuclear Facility Off-Site Emergency Plan (PEN), which include Nuclear Emergency Municipal Action Plans (PAMEN)
- Response and Support Central Level for Nuclear Emergency Plans (PENCRA), defining the organization, structure and functions at a National level in the event of emergency situations providing support to the aforementioned.

Likewise, the regulatory body, in compliance with the functions assigned by law, and in consistency with the Plaben, has a plan for its own preparedness and response in nuclear emergencies.

16.2.1 Nuclear facility plans for on- and off-site emergencies, including support organisations and support systems

On-site Level of Response

Emergency preparedness and response actions at this level are included in the On-site Emergency Plans (Self-protection) of the nuclear facility.

The purpose of these plans is to cover the set of actions foreseen by the licensee of the nuclear facility in order to reduce the risk of a radiological emergency and to limit, in case of emergency, the release of radioactive material to the environment.

No significant changes have taken place to this regard since the previous Report, although revisions of all PEI have been carried out, in order to have them adapted to the new Plaben, basically in what concerns nuclear emergency notification rules and forms. These revisions have been favourably reported by the CSN.

Off-site Level of Response

Emergency preparedness and response actions at this level are established in:

- Off-Site Nuclear Emergency Plans, which include Nuclear Emergency Municipal Action Plans.

  On 9th June 2006, the new Master Plans corresponding to the Spanish nuclear power plant off-site PEN's were approved by Agreement of the Cabinet of Ministers, with the favourable report of the CSN.

  These Master Plans substitute those effective up to that date and have been adapted to the requirements of the new Plaben of 2004.

  The revision process of the action plans and procedures of the different operational groups comprising the organisational structure of such plans is currently under way, and their definitive approval is expected by the third quarter of 2007.

  The revision of the new Pablen is already under way, once PEN Master Plans were approved in the Plenary Meeting of the corresponding City Council, and ratified by the PEN Director.

  The CSN appoints the Heads of PEN Radiological Groups, through whom these groups are managed and the radiological intervention teams are coordinated.

  Besides the reinforcement measures for the intervention capacities in possibly affected off-site areas, as described in the previous Report, a maintenance and management service for radiological characterization instrumentation assigned to the Radiological Groups has been fully implemented, including a computerised system enabling to find out, in real time, the state and location of the aforementioned instrumentation, as well

as any exchange of the aforementioned equipments between the different plans, thus increasing the flexibility in their possible uses.

On the other hand, there has been significant progress in the implementation of the dosimetric equipment replacement programme, which is expected to be concluded within the current year.

- Response and Support at Central Level Plan.

  On 27th May 2005 the Ministry of the Interior approved the PENCRA (Order INT/1695), following the favourable report of the CSN.

  The PENCRA defines a National-level response model which foresees the mobilization of all resources and capacities of the Spanish State, necessary to configure said response, including the provision of foreign help.

  National resources supporting off-site PEN's are managed by the Directorate General for Civil Protection and Emergencies (DGPCE), framed within the Ministry of the Interior, as the coordinating body of all necessary supports from the different Organisations of the Central Administration and other Administrations, and the CSN, in charge of all nuclear safety and radiation protection aspects, which will coordinate the different organisations and public or private companies whose participation is necessary for fulfilling the specific functions assigned to the CSN.

  These national resources have been recently and significantly increased with the creation of the Military Emergency Unit (UME) by Agreement of the Council of Ministers of 7 October 2005, whose competences include facing emergencies resulting from technological risks. Full deployment of these resources throughout the whole national territory is foreseen for the end of 2008.

16.2.2 CSN emergency preparedness and response in emergency situations

As already described in the previous Report, CSN's essential responsibilities in the event of a nuclear accident were established in the Law creating the CSN, as amended by Law 14/1999, and are those indicated in section 16.1.3.

For the implementation of these new functions adapted to a new regulatory framework, the CSN has carried out a plan to improve its response capacities, which includes the following main actions:

- Revision of its Emergency Action Plan (PAE)
- Update of its Emergency Response Organisation (ORE)
- Modernisation of its Emergency Room (SALEM)
- Emergency Management System Renewal Plan
- CSN personnel training plan in emergency matters.
- Renewal of institutional agreements regulating CSN support to the National Civil Protection System.

Appendix A of this Report contains a summary of the CSN Action Plan, of its ORE in the event of emergencies, and of the Salem characteristics.

Revision of the Emergency Action Plan

On 27th April 2005, the CSN approved revision 4 of the CSN Emergency Action Plan (PAE), including the Emergency Response Organisation (ORE), which includes the

functions, specific resources and basic action procedures of its managing and technical organs, its interactions and general guidelines on the required training.

This revision has entailed, among other improvements, a simplification of the operational actions, through the use of intuitive operation schemes, an update of the applicable legal framework, a reinforcement of ORE's single-command concept, the reduction of the response structure and the incorporation of technicians from the Autonomous Communities into CSN's emergency response gears.

CSN actions, through the ORE, in the event of a real emergency situation, have priority over any other CSN activity. Consequently, whenever deemed appropriate by the Emergency Management, any resource of the CSN shall be made available to the ORE, and will immediately suspend any ongoing activity.

Emergency Response Organisation Update

The ORE acts independently of the regulatory and control function assigned to the CSN and will have the following exclusive functions:

- To cooperate in bringing the emergency situation to a safe condition.
- To contribute to the mitigation of the radiological consequences, generated by the accident that prompted the emergency situation, for people, goods and the environment.
- To report to and advise the authorities responsible of managing the applicable emergency plan, regarding the adoption of protective measures for the population.
- To inform the public on the risks associated to the emergency situation.
- To fulfil the international commitments regarding prompt notification and mutual assistance in as far as the CSN is concerned.

The plan includes the processes for incorporating resources from the basic organisational structure of the CSN into the emergency response organisation and the critical emergency tasks to be performed in each situation, in order to adequately fulfilling the responsibilities assigned to the CSN within the national emergency response system. In addition, the Plan considers the activation and operation of a series of intervention services in affected areas, in relation to the off-site response level.

Modernisation of the Emergency Room

The Emergency Room (Salem) is the location from which the CSN Emergency Organisation performs its function and which houses the tools required to perform its responsibilities. This Room is permanently manned by technical and support personnel. Additionally, the CSN Emergency Organisation has personnel on-call, on a weekly rotation basis, whom permanently pays attention and go either to the Salem or to the locations affected by an emergency situation.

The CSN has implemented an emergency room modernisation plan, consisting in the modification and enlargement of its facilities and the technological upgrade of the computer and telecommunications systems necessary for the operation of the CSN emergency services.

The new Salem was inaugurated in November 2005, with architectural modifications that improve and expand accommodation requirements of the emergency management and the permanent attention service of the centre, while improving person and document transit among the different premises.

Emergency Management System Renewal Plan

As regards technological renewal of computer and Telecommunications systems of the Salem, a Systems Plan is being implemented and will be completed in 2008.

Among the Systems Plan actions carried out to date, the following are the most noteworthy:

- Installation of redundant digital communications system between the CSN, nuclear facilities and other operation coordinating centres.
- Installation of emergency operations monitoring systems.
- Update of accident diagnosis and prognosis systems in nuclear power plants.
- Update of consequence assessment and decision making systems.
- Development of an integrated Database for Emergency Management.

CSN personnel training plan in emergency matters.

The Emergency Response Organisation of the CSN has a specific Training Plan aimed at all personnel working in the CSN. The Plan includes a planning with different annual and quadrennial objectives, the results of which are assessed and published on a yearly basis, and which translates into a set of training activities structured in accordance with the following scheme:

- *Level 1 information seminars*, aimed at all CSN personnel, for them to learn the role of the CSN in the emergency plans and the function of each department of the Emergency Response Organization.
- *Level 2 operational seminars*, aimed at those workers comprising the basic structure of the Emergency Response Organization, so that its members can learn about the Emergency Response Organization and emergency plans in detail. A special edition of Level 2 Seminars is aimed at training the Management of the CSN.
- *Level 3 technical seminars*, aimed at CSN personnel assigned to technical functions, so that they can learn about the procedures and tools they must use in the event of an emergency.
- *A specific training programme* for the personnel working permanently in the Emergency Room.
- *A training program* based on the participation in different types and levels of Exercises and Drills.
- *A catalogue of general courses* on emergency management, given by national and international organizations, which are regularly attended by CSN personnel involved in the Emergency Response Organization.

National Civil Protection System support renewal

This action materializes in the publication of a services letter in which the scope and content of the services rendered by the CSN to the National Civil Protection System concerning planning, preparation and response against nuclear and radiological emergencies are defined.

These services are:

- *Development of technical regulations and recommendations,* in particular, the definition of radiological criteria for setting up the emergency plans (listing of installations and activities entailing radiological risks, accident typology, planning areas, intervention levels, protective measures, etc.)

- *Technical Advice* in matters of scope, content, means, resources, etc. of nuclear and radiological emergency plans.
- *Collaboration* in carrying out and implementing emergency plans.
- *Cooperation* in the provision, maintenance of the capacity, verification and activation of emergency plans, by contributing with its own resources and means.
- *Training of the acting people*, establishing the basic content of the training programmes that the intervening personnel must complete, based on the degree of responsibility within the response organization, training instructors and offering courses and seminars to the most relevant collectives (important, among which the Armed Forces, the Police, Emergency and Fire-fighting Services, Civil Protection Services, etc. stand out).
- *Information to the public*, on a previous basis, so that citizens can learn about the risks arising form nuclear and radiological accidents and the guidelines to be followed to minimize their consequences, and, during the development of an emergency situation, to order the implementation of protective measures.
- *International Cooperation* in the framework of the Prompt Notification and Mutual Assistance Conventions and bi-lateral agreements in emergency matters entered into by the CSN and the regulatory bodies of other Countries.

16.2.3 Measures for public information on emergency preparedness in areas surrounding nuclear facilities

The Agreement of the Cabinet of Ministers regulating the aspects of public information regarding nuclear and radiological emergencies continues being applied.

As previously indicated, the stipulations of this Agreement of the Cabinet of Ministers related to prior information to the public in the surrounding areas of nuclear power plants have been recently developed and reinforced by means of the approval of the first Guideline specified in section 16.1.2 of the this Report.

The Nuclear Safety Council, for its part, collaborates closely with the Directorate General for Civil Protection and Emergencies in providing information for the population of nuclear emergency planning areas in issues such as the following: preparation of information plans and programmes, design and publication of informative brochures on emergency plans and giving lectures in direct public information sessions.

On another hand, the stipulations of this Agreement of the Cabinet of Ministers related to training of acting people in nuclear emergency situations, have been recently developed and reinforced by means of the approval of the second Guideline specified in section 16.1.2 of this Report.

In application of the above Agreement and Guideline, training courses are currently being prepared for and given to the intervening forces (fire-fighters, civil protection technicians, safety forces and bodies, the Military Emergency Unit).

In this context, the works for the planning, preparation, teaching and follow-up of a full course for training the people acting in nuclear emergency situations have started based on an adaptation of the European Commission Phare Project to Spanish regulations.

16.3 Instruction and on going training: drills and exercises.

Since the last report, the programme of exercises and drills of the on-site nuclear emergency plans has continued, which include a drill at each nuclear facilities every year. These programmes are prepared and performed in accordance with CSN Safety Guide

GS-1.09 on emergency drills and exercises at nuclear power plants. This guideline was revised in year 2006 with the purpose of reinforcing, among other things, the assessment and control aspects of the development of the drill and the independence between the acting people and the designers of the scenario. In this context, the Technical Drill Assessment Group (GTES) has been created within the CSN.

A great experience has been accumulated in the execution and follow-up of exercises and drills of on-site Emergency Plans, and improvement opportunities have been detected after their carrying out, similar to those described in the previous national report on the Convention.

As a consequence of the transition period that has taken place during the time covered by this report on the Convention, related to the approval process of the new Plaben, its guidelines, master plans and action plans of the PEN operational groups, there has been a slow down in the execution of the general exercise and drill programme for off-site Emergency Plans, which is expected to be re-launched in the short term.

The programme of general drills corresponding to the off-site plans is complemented with a programme of partial exercises in all the plans, which include: local, provincial and national emergency coordination centres, classification and decontamination stations and access controls.

In both the partial exercises and the general drills, a team of observers made up of technicians from the different organisations involved is set up; after every exercise this team holds a meeting, in which the exercise is analysed and reported on. The conclusions of these reports are incorporated into the documentation of the plans and constitute proposals for improvement of the response resources.

16.4 International agreements

The CSN and the Directorate General for Civil Protection, as the national authorities, regarding IAEA Conventions on prompt notification and mutual assistance in the event of nuclear accident, respectively, have incorporated into their nuclear emergency management systems the provisions of document EPR-ENATOM-2000 "Notification and assistance in emergencies. Operations Technical manual".

The Nuclear Safety Council emergency room (Salem) is the Spanish point of contact and alert, as established in the aforementioned manual.

On another hand, the first contacts required to start the work aimed at establishing cooperation agreements with French authorities involved in the planning, preparedness and response in nuclear emergencies, have been established.

16.5 Degree of compliance with the obligations of the Convention

Since the third national report on Convention compliance, a series of significant actions have been developed with the purpose of improving the general response capacity to nuclear emergencies in Spain. The most important ones make reference to the following issues:

Implementation of the new Plaben after its approval:

- Development of the Guidelines identified in section16.1.2 of the present report.
- Approval and application of the Master Plans for Off-site Nuclear Emergency Plans (16.2.1).

- Approval and application of the Emergency Plan for the Central Response and Support Level (16.2.1).
- Continuation of the implementation of the plans for improving and updating the means and capacities for Off-site Nuclear Emergency Plans.

CSN response and preparedness:

- Approval and application of the new CSN Emergency Action Plan, including the new Emergency Response Organisation (16.2.2 and Appendix A).
- Execution of the Emergency Room modernisation plan, entailing the remodelling and enlargement of its premises, and the technological update of its computer and telecommunication systems, (16.2.2 and Appendix A).

As a result, the general conclusions drawn in the previous report continue to be valid, according to which Spain's planning and response to nuclear emergencies meets the requirements of Article 16 of the Convention.

On the other hand, the Basic Guideline for the Civil Protection Planning against Radiological Risks, the state of completion of which was indicated in the third report on the Convention, has been finally limited to radiological emergencies arising from activities or facilities other than nuclear power plants, and therefore is not considered to be applicable in the Convention on Nuclear Safety.

Appendix 16.A

CSN Emergency Response Organisation

The management of nuclear and radioactive emergencies in Spain is regulated by means of the national civil protection system and the requisites for the use of nuclear power and ionising radiations.

From a civil protection standpoint, the general organisation principles are established, along with the responsibilities, rights and duties of the citizens, public administrations and licensees with regards to the planning, preparedness and response to emergency situations. Likewise, emergency plans are established for off-site action whenever accidents in the nuclear facilities have an impact on third parties.

From the standpoint of the nuclear regulations, emergency plans are required to be available for each radiological practice, and the specific criteria regarding intervention levels and techniques are established, along with the protection measures on which plans are based.

Taking into consideration the specific nature of nuclear and radiological emergencies, the Nuclear Safety Council (CSN) assumes a set of functions in these matters that fall beyond its competences as nuclear regulatory body.

In order to fulfil these functions with the appropriate level of effectiveness and efficiency, the CSN has a Emergency Response Organisation (ORE), complementary to its normal working organisation, which has with a single-command operational structure, embodied by its President, who assumes a managing function and makes decisions, and in which the CSN technical and logistics units are included, in accordance with an action plan specifically established for these cases and which is activated depending on the level of severity of the accident triggering the emergency.

The ORE basically operates from an Emergency Room (Salem) which is in constant alert status, according to which it is attended in a closed shift basis, and has an on-call team available which can respond to any emergency situation within an hour time frame.

The CSN Emergency Action Plan includes a personnel training programme, framed within the training plan for acting personnel taking part in emergency plans of nuclear installations, and the areas in which these are located. Likewise, the CSN Emergency Action Plan specifies an exercise and drill programme with an internal, national and international scope, which enables the verifications of the operational status of its technical capacities and the implementation of the appropriate improvements on a periodical basis.

The ORE has a hierarchical structure, which acts in accordance with the single command principle and complements the CSN ordinary organisation.

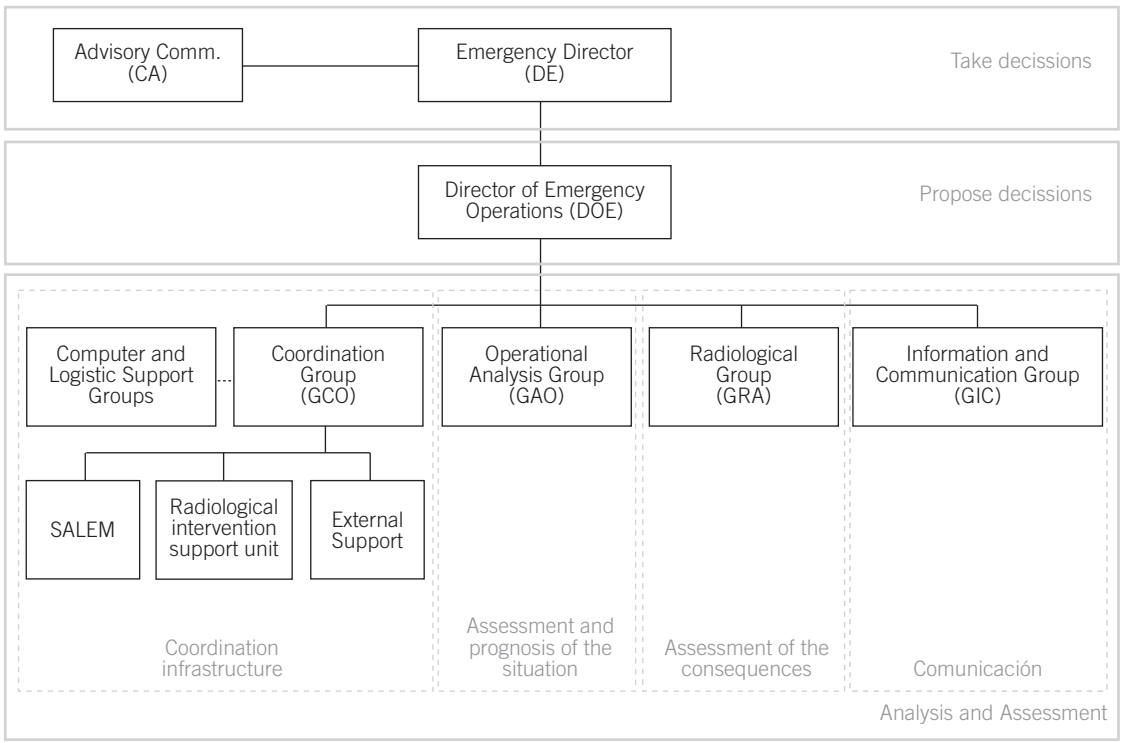
The ORE is structured in the following three hierarchical levels:

- *The Emergency Director*, advised by a committee comprising the Plenary Meeting of the CSN, is responsible for running the ORE, making decisions and transmitting CSN recommendations to the Management of the applicable emergency plan and for cooperating with the authorities informing the public. The DE function corresponds to the President of the CSN.

- *The Director of Emergency Operations*, responsible for the coordination of all actions and preparing proposals of recommendations that the DE has to forward to the Management of the applicable emergency plan. The Director of Emergency Operations is one of the two Technical Directors of the CSN.

- *The Operational Groups*, responsible for implementing the necessary technical actions to draw the recommendations to be transmitted by the DE to the Management of the applicable emergency plan, for activating and coordinating intervention teams, and for the preparation of the information that is to be communicated outside.

Figura 16.1 Estructura organizativa de la ORE



Specifically, the missions of ORE Operational Groups are the following:

- The mission of the *Operational Analysis Group* is to analyse accident causes and anticipate possible future developments, and to report the DOE on the measures that should be adopted in order to lead the emergency situation to a safe condition, bearing in mind that the responsibility for adopting appropriate preventive decisions and measures corresponds to the installation.
- The mission of the *Radiological Group* is to analyse the radiological situation generated by the accident, to propose appropriate measures to the DOE aimed at mitigating radiological consequences thereof affecting the public in general, the equipment and the environment, and to cooperate in their implementation.
- The mission of the *Information and Communications Group* is to provide other ORE organs and bodies with which the CSN has assumed a prompt notification commitment with information on the installation or place of the accident that is necessary for the development of their functions. Likewise, the GIC is responsible for preparing the information on the emergency that, in fulfilment of the functions assigned to the CSN, has to be provided to the mass media and the public.
- The mission of the *Coordination Group (GCO)* is to maintain the ORE structure in full operational conditions, and to ensure the flow of information among all its organs and with other entities. This group coordinates the Computer Support Group and the Logistics Support Group, and manages external support and emergency on-call teams.

  The Computer Support Group ensures the operative conditions of CSN corporate information systems in the event of an emergency, providing feasible alternatives, if needed, to guarantee the fulfilment of ORE basic functions, and provides technical support to ensure appropriate operative conditions of the Computer and Communications systems of specific use by the operational groups.

The Logistics Support Group ensures the availability of all required logistics means for the operation of the ORE, or offers feasible alternatives that guarantee the fulfilment of the basic functions thereof, as well as it guarantees ORE safety.

The General Sub-directorate for Emergencies has been assigned in the CSN organisation, among others, the operation maintenance of the Salem, the management of the external supports and of the emergency on-call personnel. Therefore, GCO responsibilities are closely linked to the operation of this Sub-directorate.

The ORE structure is variable and could be adapted to different response levels regarding the composition of its human resources: permanent (Salem), reduced (on-call teams), basic and expanded.

The ORE can take action in four Response Modes (from 0 to 3), and remains in permanent Mode 0 alert status through the operation of the Salem, and is activated in the other three Response Modes depending on the severity, complexity or duration of the emergency situation.

Nuclear Safety Council Emergency Room (Salem)

In order to ensure that the different elements of the CSN emergency organisation, described above, are able to perform the functions assigned to them in an efficient and coordinated manner, the CSN has an Emergency Centre known as the Salem. Salem is an abbreviation of "Sala de Emergencias" (Emergency Room).

The Salem is a national key centre for the notification, information, follow up, analysis and assessment of all nuclear accident or radiological emergency situations that might occur within Spain or beyond the country's frontiers but implying actual or potential repercussions for the national territory.

The Salem has been subjected to an important reform process affecting its architecture and its communications system, which has improved substantially the ergonomic and operational characteristics thereof. The new Salem was inaugurated in November 2005.

The Salem has the appropriate communications and assessment tools available to advise to the emergency plan directors of the exterior response level that have to be activated, on the development of the accident, on its potential consequences, and on the protective measures that should be implemented.

Within the Salem Systems' Plan, in the period elapsed since the last Report on the Convention, the communications with each of the points integrated in the Plaben have been replaced. An emergency communications network has been created, linking the nuclear power plants and the Operation Coordination Centres (CECOPS) with the CSN, allowing for voice, data and videoconference communications for all the points. This network has been designed with a high degree of physical and logical redundancy in order to guarantee the reliability required for an emergency network.

Advances have been made on the modernisation of the data transfer systems between the nuclear power plants and the CSN for emergency situations, creating the core of the emergency information database, which will enable to integrate all the necessary information. This process is expected to conclude in 2007.

The Centre and the information, calculation and assessment systems available are briefly described below.

The core of the Salem consists of 5 operational independent rooms, interconnected to each other. The Salem is considered to be a controlled access restricted area within the CSN.

The Salem is fitted with a series of surveillance, calculation and assessment systems that together constitute a set of specialised tools that are used by the emergency organisation experts for performing their functions.

The main room is the so-called Emergency Management Room and constitutes the working space of the Emergency Director, the Emergency Operations Director and the place where the Heads

of the Operational Groups defined in the CSN Action Plan report. The remaining four rooms constitute the working space of operational groups: operations analysis, radiological, information and communications, and coordination.

The Salem is manned 24 hours a day, 365 days a year by an on-duty technician qualified in nuclear safety and radiation protection and by a communications officer.

The *Operations Analysis Group Room* houses a safety parameter transmission system, necessary to help CSN personnel in gaining insight into the operational situation of the plant and in reliably assessing the degree of safety of the installation in emergency situation. The main function of this system is to identify abnormal operating conditions, providing a continuous indication of safety-related parameters or other variables representative of the operational status of the plant.

This room is also fitted with a real-time plant analysis system incorporating the MAAP code, specifically adapted to each nuclear power plant, and is connected to the safety parameter reception system of each installation. This system assesses and anticipates the evolution of severe accidents. It is also used as a facility for training CSN personnel on severe accident issues, by simulating this type of accidents.

The *radiological analysis group* room is equipped with the environmental radiological monitoring networks. These networks allow the CSN to address its responsibilities in relation to the measurement and control of the levels of radiation and contamination outside the nuclear and radioactive facilities. The CSN has its own automatic network of environmental radiological surveillance stations, known as the REA, made up of 25 stations distributed across the country, each of which consists of an automatic radiological station measuring the radiation and concentration levels of radon, radio-iodine and alpha and beta radioactivity emitters in the air, and of a meteorological station (belonging to the National Meteorology Institute) that measures the main meteorological parameters. The REVIRA network control centre at the Salem also receives data from all automatic station networks implemented by the Governments of the Autonomous Communities of the Spanish State. A consultation terminal (associated centre) is available at the Salem, pertaining to the radioactivity alert network belonging to the Directorate General for Civil Protection of the Ministry of the Interior, which is made up of 907 automatic radiation rate measuring stations distributed across the country.

The CSN currently has various calculation codes for the estimation of doses during emergencies, which take into account atmospheric dispersion, a factor of fundamental importance in determining the radiological risk associated with the releases of radioactive material that might occur in the event of a nuclear emergency. Most of these codes come originally from the NRC and have been adapted to the Spanish nuclear power plants: IRDAM, RASCAL AND MESORAD.

The Salem is also equipped with the generic application of the RODOS decision-making support system, which is currently being adapted to the conditions of the Spanish emergency plans via a specific CSN project.

In order to operate properly, these emergency dose estimation codes require the values of different meteorological parameters as inputs, the objective being to estimate or calculate the prevailing conditions of atmospheric dispersion. Accordingly, the CSN has a system that links the Salem to the meteorological towers of the different nuclear sites. Furthermore, there is a direct connection to the National Meteorology Institute via a data transmission line, for the reception of the parameters required to estimate wide range doses and of weather forecasts.

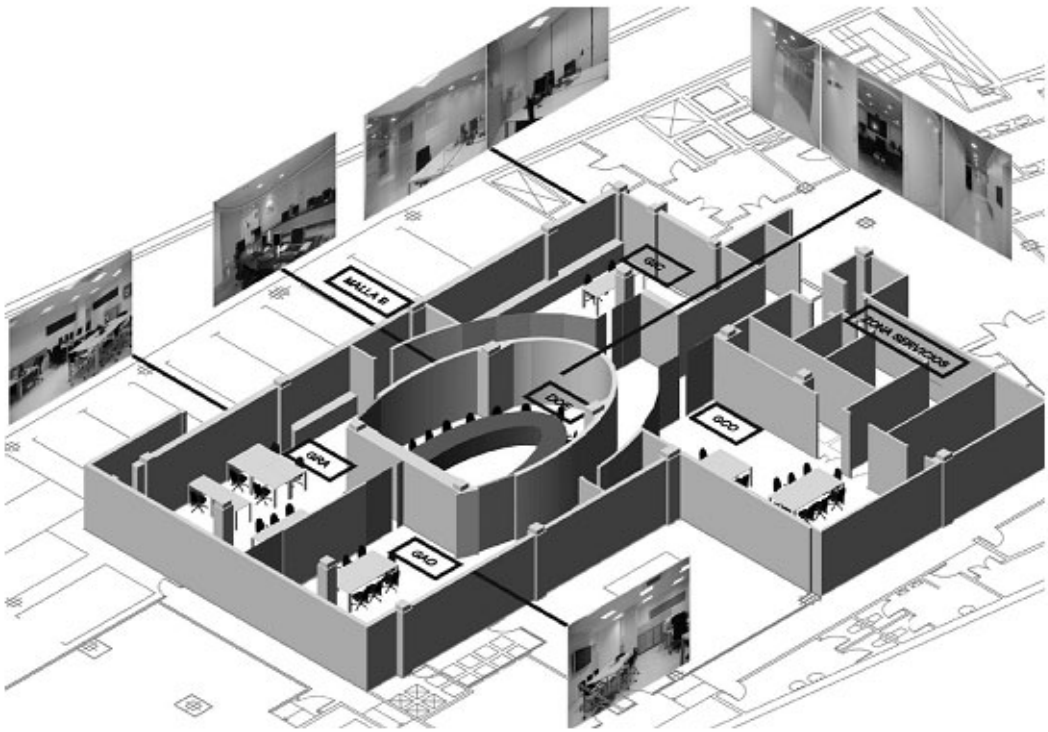
In the *Technical Support Group Room*, and with the purpose of enabling it to meet its purpose of providing the other operational groups with technical documentation on a given facility, there is an archive housing documentation on emergency situations for each of the nuclear groups: general and emergency operating plans and procedures, radiological surveillance plans, technical specifications, etc.

This document centre was completely remodelled during 2006, increasing its reliability and undertaking documentation expurgation, updating and encoding tasks, in agreement with the ORE operational groups, and with the owners of the facilities.

This room also has the format and technical means needed for notifying on emergency situations, in accordance with the Convention on prompt notification of nuclear accidents.

The *Coordination Group Room* has the appropriate technical means for ensuring the flow of information between all ORE operational groups and for external communications, a computerised "event log" which enables to centralise, and display to the whole organisation, the different sequences of events taking place during an emergency, and a connection system with Red Eléctrica Española (Spanish Electricity Grid Company), which provides real time information on the status of the connection of to the Spanish nuclear power plants to the national grid.

Figure 16.2 Salem Layout



d) Safety of facilities

Article 17. Site

17.1 Significant licensee activities in relation to the safety of nuclear power plant sites

The Spanish nuclear power plants keep in operation the necessary site parameter surveillance programmes: seismological (seismic instrumentation and transmission of the recorded information), meteorological (meteorology instrumentation and transmission of the recorded information) and hydro-geological (monitoring networks and data acquisition points). Furthermore, at the Ascó, Vandellós and Trillo nuclear power plants, earth movement's surveillance programmes are in force for the auscultation of global and differential movements, which are in a stabilization process as shown by the clearly damping evolution thereof. There is a surveillance requirement on the stability of the fuel building of Almaraz NPP and the results are included in the Monthly Operating Reports.

The Spanish nuclear power plants completed the adaptation, or the implementation, of seismic instrumentation systems that follow the recommendations of the NRC regulatory guides: R.G. 1.12, "Nuclear Power Plant Instrumentation for Earthquakes", rev.2, 1.166 "Pre-Earthquake Planning and Immediate Nuclear Power Plant Operator Post-Earthquake Actions" y 1.167 "Restart of a Nuclear Power Plant Shut Down by a Seismic Event". As a result, the Operating Specifications were adapted and new procedures implemented making it possible, in the event of seismic movements at the site, to verify whether the level of the Operating Basis Earthquake (OBE) has been exceeded and to perform the inspections required if this occurrence has been confirmed.

In accordance with their programmes, all plants have carried out the revision and/or maintenance of PSA's off site events studies (level 1), performed in accordance with the "Integrated Programme for performing and using Probabilistic Safety Assessments in Spain" and with the methodology described in NUREG-1407 of the USNRC.

Vandellós NPP licensee, as operator of the facility, has analysed the risks that the construction of a conventional electricity generating plant close to Vandellós site might entail for the operational safety of Vandellós NPP, since in the construction authorization of this new plant some conditions were included to safeguard nuclear safety and radiation protection at Vandellós II NPP.

In general, the actions of the licensees related to the surveillance of site parameters and the performance of studies and analyses on site safety, in accordance with previously established and scheduled plans, are in keeping with the forecasts made and satisfactorily fulfil the requirement of continuous site surveillance and of reasonable progress in nuclear power plant safety improvement.

17.2 Regulatory control of licensee activities

The Regulatory Body has reviewed the studies and reports that the licensees have elaborated during the period covered by this report in relation to site parameters surveillance programmes and have also carried out the supervision and control inspections at nuclear power plant sites defined in the Basic Inspection Plan. All this, following the

processes and procedures developed for that purpose in the Nuclear Safety Council Quality System.

Specifically, the implementation of the new seismic surveillance systems for nuclear power plants, which include digital accelerometers mounted on the field and inside the buildings, has been reviewed and inspected. The changes to the Technical Specifications and the implementation of specific procedures relating to exceeding the operating basis earthquake (OBE), including plant walk downs to identify earthquake damage, have also been reviewed and inspected. Moreover, significant improvements implemented by the licensees in other site parameter surveillance programmes have been reviewed and inspected.

When revising the PSA - external event studies and their maintenance, the risks derived from earthquakes, floods, strong winds, transport routes and nearby industries have been specifically considered. These studies have reviewed the event occurrence and the performance of elements important for safety when facing up beyond design basis events (leaving out those events with a yearly frequency of recurrence lower than 10-6) in order to detect specific vulnerabilities of each nuclear power plant that could be effectively eliminated at a reasonable cost, in other words, by applying improvements with a good cost-benefit ratio.

Within the review processes followed for the assessment of external events and their consequences, special attention has been paid to the identification and selection of initiating events, to the adequate use of databases as input information and to the homogenization of return periods when calculating site parameters. Likewise, specific efforts have been devoted to due consideration of the evolution of possible external events caused by the presence of nearby industries and of land transport routes close to nuclear power plants.

In connection with the inspections carried out, it has to be stressed that the implementation of a specific plan of periodic inspections to each nuclear power plant has been completed in relation to site parameters, which is part of the Integrated Plant Supervision System (SISC). The purpose, scope and periodicity of these inspections are included in procedure PT.IV.201, "*Protection against severe meteorological conditions and floods*".

The ultimate aim of these inspections is to verify that the application of licensee's procedures intended to protect the mitigation systems against severe meteorological conditions and floods is coherent with the design requirements and the assumptions made for the plant PSA. Basically, the Plan consists in performing two types of inspection: one with a general scope and 2 years periodicity; the other of limited scope and six months periodicity. In the general scope inspection, all risks related to meteorological and flooding events identified for each power plant site are included; the licensees supporting studies and documents, the results of the applied surveillance programmes, the operating experience incidents and the corrective actions programme are reviewed. On the other hand, the six-monthly specific scope inspections are carried out on safety related structures, systems, equipment and components previously selected that might be affected significantly by severe meteorological conditions or external floods.

A two yearly general inspection related to the site is also included in the SISC for verification of the operation of the ultimate heat sink and the water intake structure (procedure PT.IV.206).

17.3 Degree of compliance with the obligations of the Convention

Referring to the safety of the nuclear power plant sites and taking into consideration the actions carried out by the licensees and the regulatory control thereof, it might be concluded that Spain complies with the safety requirements established in this article of the Convention.

Article 18. Design and Construction

18.1 Significant Licensee Activities in relation to nuclear power plant design safety review

The significant licensee activities related to the Periodic Safety Review are included in Section 14.2.

During this period, in relation to Probabilistic Safety Assessment (PSAs), the application of the Integrated Programme issued by the CSN in 1986 and reviewed in 1998 has continued. In accordance with its contents, a project has been carried out at José Cabrera NPP to assess the risks associated with radioactive sources other than the reactor core, the results of which are being used in the licensing process for the cessation of its operation. In this case, the only radioactive source worth being analysed in each plant due to its contribution to risk was the spent fuel pool, where the fuel is stored until the on-site temporary store is available. The design of said store was favourably appraised in 2005 for this purpose. The evaluation of the transport casks and the modifications to enable the loading of said casks and the movement of heavy loads are under way.

In the period covered by this Report, the plants have maintained and updated their PSAs in accordance with criteria and procedures agreed with the CSN in 2000. After its application for a period of time, these criteria and procedures have been issued as a CSN Safety Guide (GS 1.15).

Likewise, during this period, nuclear power plant licensees have continued to carry out different Probabilistic Safety Assessment (PSA) applications in support of licensing and safety improvement processes. These applications have consisted in the execution and presentation of several risk-informed modifications, among them, the extension of the periods of inoperability of some components required in the Plant Technical Specifications, or the risk-informed In-Service Inspection practices. This kind of requests was started in the years 2000 and 2001, after an analysis and application methodology derived from that followed by the NRC was adapted in each case. This methodology was previously validated by means of a pilot experience.

The plants have finished updating the design basis and licensing documents of each licensee. The purpose of this activity has been to compile the design basis and the licensing basis for each safety-related system. The update of the design basis requires to verify the hypotheses, data and results of the accident analysis included in the Safety Analysis Report, the identification of the design basis of the support components needed to carry out the safety functions and the design modifications included in the safety systems. The review of the current physical reality of each system and the operation procedures are also included in order to reconcile operational practices with system design. An updated content – sufficiently contrasted and reconciled with design-basis documents – of the Safety Analysis Report has been obtained as the end product of this process.

Additionally, early in 2006 a joint working group, comprising representatives from the electrical sector and the CSN, was set in motion to prepare a guide that enables a homogeneous treatment of the Anomalous Conditions (degraded conditions and non-compliance conditions) that could arise during plant operation. This guide will be endorsed by the CSN in 2007.

The control of the aging of the components of the systems is a key element in the Life Management that is reflected in a condition included in the operating permits. According to this condition, the licensee must send to the Directorate General of Energy Policy and Mines and to the CSN a report on the surveillance of the mechanisms of aging and degradation of the structures, systems and components related to safety and their current state, identifying the new inspection, surveillance and maintenance activities incorporated to detect said mechanisms and control their effects. Said Plant Life Management Plans are based on the System for the Assessment of the Remaining Life in LWR Nuclear Power Plants, developed jointly by the Spanish nuclear power plants associated in Unesa.

Article 81 of the Regulation governing Nuclear and Radioactive Facilities, approved in 1999, introduced the possibility of requesting the CSN to issue a favourable appraisal statement on new designs, methodologies, simulation models or verification protocols related to the nuclear safety and radiation protection of the facilities or activities to which this Regulation refer to. This statement from the Nuclear Safety Council may be included in any subsequent process for requesting any of the authorisations contemplated in this Regulation, provided that the limits and conditions imposed in the statement are met. Under said article, the National Waste Company (Enresa) submitted in June 2005 a project for the Generic Design of a Centralised Temporary Storage for High-Level Waste, which received a favourable approval in June 2006.

18.2 Regulatory Control of Licensee Activities

The CSN has resident inspectors at each site, which in addition to the execution of the Inspections envisaged in the Basic Inspection Programme common to all plants – as described in Article 19 – allows the CSN to carry out an adequate regulatory control of licensee activities. Each licensee must also provide a set of periodical or non-periodical reports envisaged in each license. It has been continued the practice mentioned in the previous report, being classified and identified those reports that must be evaluated and those that, being subject to a supervision process, are elements to be taken into account in the inspection programme of each plant.

In order to verify that nuclear power plants are operating in accordance with the conditions and regulations established and that the actions required in the different permits and approvals are adequately implemented, the CSN carries out a Basic Inspection Programme such that each of the nuclear power plants receives at least a biennial Inspection in each of the areas object of the Inspection. Two Resident Inspectors, who take part in the execution of that Inspection Programme, are available for the implementation of this programme Article 19 provides more details on this Inspection Programme

Maintenance Rule

A process for the implementation of the Maintenance Rule was initiated in Spain in November 1993, defining a methodology for complying with the USNRC's 10 CFR 50.65, which was approved by the CSN in October 1996 This methodology was subjected to a verification and validation process at two pilot power plants (Vandellós II and Cofrentes), which was completed in December 1998 and included the determination of the structures, systems and components that had to be considered, the risk-significant aspects, the performance criteria, the periodical evaluation reports and the safety assessment to be conducted for equipment tagout/lockout during maintenance activities at the two pilot power plants Once the implementation in the pilot power plants was complete, the process for the remaining plants was started, except for Trillo nuclear power plant, for which it was delayed until 2002 due to its specificity The CSN receives a report from each plant on the

application of the Maintenance Rule during each cycle, and inspections on this subject are carried out every two years, within the Basic Inspection Program

In-Service Inspection

Before the start of each inspection interval – which covers a 10-year period during which the inspection of all inspection areas has to be completed – licensees must send to the CSN a general review of the "In-Service Inspection Manual" including the areas that must be the object of an inspection, as well as the non-destructive testing method that must be applied in each inspection area in accordance with the requirements of ASME Code, Section XI, in the applicable edition.

Furthermore, prior to any refuelling outage – as included in the CSN Instruction IS-02 regulating the documentation on refuelling activities in light water plants – each plant must send the inspection programme, including inspection percentages; areas to be inspected; non-destructive testing techniques to be used; the support and snubber inspection program; planned personnel, equipment and means to be used; the scope of the steam generator tube inspections (for PWR) including the expected methods and techniques to be used; special inspections and tests; as well as the planned valve and pump functional tests or pressure tests to be conducted in compliance with specific surveillance requirements.

Once each refuelling is complete – as also stated in the aforementioned CSN Instruction IS-02 – each plant must send a final report with the results and the degree of fulfilment of the initially planned inspection programme, clearly identifying the deviations occurred; the areas with interferences above 10 % of the volume under examination; each inspection or test program individually; as well as the participating personnel and the equipment used. This report must explicitly show the areas in which reportable indications or anomalies have been detected.

All this information is subjected to a supervision process by the CSN, through of the inspections conducted by the CSN within the Basic Inspection Programme for each plant. When licensees have proposed a modification to the In-Service Inspection Programme using risk-informed criteria, this methodological change has been assessed by the CSN. As previously discussed, over these last few years the CSN took part, together with the licensees, in the development of its own methodology for validating systems of in-service inspection (ISI) of Spanish nuclear power plant components, as is defined in European Methodology for Qualification (second issue) (ENIQ Report no. 2 EUR 17299 EN, 1997) and in Common position of European Regulators on Qualification of NDT systems for pre-and-in-service inspection of light water reactor components, Rev. 1 (EUR 16802 EN, 1997) This methodology has been generically accepted by the CSN and has received the CSN's favourable appraisal ,at Unesa's request, for its use on each of the plants so requesting.

Life Management

In relation to the life management activities undertaken by the licensees, the CSN intervened from the beginning by conducting a generic evaluation of the methodology proposed by the electricity industry. The operating permit of each power plant includes a condition that requires the sending of an annual report on lifetime management activities of the plant. This includes surveillance the mechanisms of ageing and degradation of safety-related structures, systems and components. The implementation of life management in each plant has been monitored through specific Inspections included in the Basic Inspection Programme of each power plant.

On the other hand, Safety Guide 1.10, which indicates the activities to be taken into account in each Periodical Safety Review (PSR), includes the overall review of the deterioration or ageing processes and the corrective measures applied or contemplated during the period included in each Periodical Safety Review. The information applicable to life management is subjected to an evaluation process, as all the other PSR-related issues.

This same systematic approach, in which an PSR must be conducted prior to any new operating permit being granted, are equally valid for those cases in which the period of validity for the new Operating permit exceeds the lifetime originally considered in the initial design of the installation. The permit renewal process after an PSR is carried out, which includes the analysing of the performance of the facility in the previous years, is a reasonable guarantee that the safety conditions will be maintained during the following period.

In that case, it is understood that special considerations must be given to conditions related to ageing management, necessary for reviewing the analyses performed under a defined design life hypothesis and thus have a guarantee that plant operation can be extended beyond the initial and administrative design lifetime (submittal of the documentation must be sufficiently in advance to allow its evaluation, which must be greater than in other cases, or supplements to official operation documents, etc.).

In May 2001, an internal working group was created within the CSN to analyse the conditions that would be necessary for the long-term operation of nuclear power plants (beyond their design time), and to define the criteria for their safe operation, identify the studies and analysis to be carried out in order to fulfil said criteria, and establish all necessary regulatory documents. The result of this work is included in a document that was approved by the CSN at the end of 2005. This document, in relation to the regulations to be analysed by the licensee is concerned, apart from modifying the practice established up to date regarding the continuous review of the regulations of the country of origin of the project, proposes to incorporate other regulations from the application of which a significant improvement in safety may be derived – even though they may not be of direct application in the country of origin for similar plants. The decision on which standards must be considered in each case will fall on the CSN itself. Once it is approved by the CSN, this document will be used as the starting basis for incorporating those regulatory modifications that are necessary.

18.3 Prevention of Accidents and Mitigation of Their Consequences Emergency Operation Procedures and Severe Accident Management Guides

The implementation of the Severe Accident Programme in nuclear power plants described in previous national reports can be considered as completed; there is only one open programme, which is that relating to the incorporation of the modifications necessary to carry out the feed & bleed strategy in the primary circuit at Trillo NPP, as the last strategy to prevent damaging the core in case of loss of heat removal capacity using the secondary circuit. The programme in question consists in the application of Cost-Benefit criteria for the design modification implementation, following the methodology of the CSN-Unesa Guide "Guide for Carrying Out the Cost-Benefit Analysis". The need, or no need, of implementation of such mitigation measure will be derived from the project's result.

Throughout the period covered by this report, plant licensees have given the retraining courses needed to maintain the level of response against Severe Accidents.

The emergency drills performed in several plants in these last few years have considered a fictitious scenario in which a situation requiring the use of Severe Accident Guides was

reached. This has been the case of Santa María de Garoña NPP in 2004 and 2006, José Cabrera and Cofrentes NPPs in 2005, and Almaraz NPP in 2006.

18.4 Incorporation of Qualified and Proven Technologies incorporation of human factors in the human-machine Interface

The importance of safety-related structures, systems and components being provided with redundancy and diversity, such that they are able to carry out their function even in the event the most limiting single failure, has been pointed out throughout this article. When a new design is to be incorporated, a prior homologation process is available to prove by means of analysis, test programmes, prior experience or a combination thereof that the design is appropriate. Furthermore, given that Spanish nuclear power plants are of American or German design, most of the technologies incorporated into the designs have a previous application experience.

Safety system components are subjected to a qualification process, both environmental and seismic, which takes into account the environmental conditions under which they have to perform their function. Environmental qualification results are included in the appropriate environmental qualification manual of the equipment, in which the environmental conditions the equipment in question must withstand are specified. The conditions established in said manual are verified in the inspections contemplated in the Basic Inspection Programme.

Digital instrumentation and control systems have been gradually incorporated into nuclear power plants for replacing instrumentation that has become obsolete. Examples of these are the incorporation of distributed control systems for controlling the reactor and feedwater system, or the recirculation control systems, as well as in the main turbine control system or in the nuclear instrumentation system. Special attention has been given to systems incorporating digital instrumentation; a guide has been prepared in cooperation with the electricity sector for the implementation of digital systems in nuclear power plants in order to verify and validate the software of this type of systems. During the period covered in this report, said guide has been applied in the licensing of some of those design modifications that have been motivated by the need for replacing controls systems that have become obsolete over time.

18.5 Experience Feedback

The generic letters issued by the USNRC are within the scope of periodical tracking of the changes in the regulations of the country of origin of the technology. In the period of this Report, special consideration has been given to the generic letters relating to the integrity of PWR Steam Generator Tubes (GL-2006-01); the performance and possible clogging of the filters of the recirculation sumps from which the emergency cooling systems would suction (GL 2004-02); and the habitability conditions of the Control Room (GL 2003-01) In each of these cases, the actions considered in those generic letters have carried out by the licensees, and the corresponding evaluations have been conducted. With regard to Control Room habitability, an individualised test programme was established for each plant – which will be completed by late 2007 – in order to determine the infiltrations existing in each of the Control Rooms, as indicated in said generic letter. As for the performance of containment sumps, the assessment of the measures taken at each plant has entailed the execution of specific tests. The objective of this assessment programme is that the modifications to be implemented in each power plant are completed before 31st December 2007.

As far as the human-machine interface and the application of human factors in the design are concerned, it is worth highlighting that after the TMI event and the actions derived, licensees carried out a Control Room design review process, incorporating ergonomic criteria into said design review. This review process was the object of a detailed monitoring by the regulatory body and it enabled a set of improvements in the design of the Control Room to be implemented. Article 12 includes further details of the activities performed by licensees and the follow up of the regulatory body of the human factor aspects.

18.5 Degree of Compliance with the Obligations of the Convention

Spanish nuclear power plants are based on light water technology (PWR and BWR), of a validity corroborated by many years of operational experience and contrasted by means of tests and analysis. The design facilitates a reliable operation and takes into consideration the importance of the human factors and the human-machine interface. In the past, important modifications entailing significant improvements were introduced.

The Spanish legislation contemplates a formal mechanism for obtaining the licenses of a nuclear power plant in which the CSN intervenes as the sole body competent as regards nuclear safety and radiation protection – independent from the Central Administration of the State – whose conclusions from a nuclear safety and radiation protection standpoint are binding on the Ministry in charge of granting the permit. The assessment of the initial operating license includes the review of the design, the monitoring of the construction and the verification of the suitability of the facility by means of a test programme. The basis for the permit rests on the submittal by the licensee of a request with the corresponding licensing documentation attached. Significant facility modifications are also subjected to a review and approval process, as appropriate.

The concept of defence-in-depth or utmost safety has always been present in the design of Spanish nuclear power plants. This concept has been applied both in the design and maintenance of physical barriers and of the technological safeguards the purpose of which is to protect the integrity of said barriers, both in case of foreseeable operational situations and in accident circumstances.

The design also pays special attention to the prevention of the postulated accidents and the mitigation of their consequences. The reactor protection system and associated safeguards are designed with broad safety margins, following standards of recognized validity. Containments and their associated technological safeguards also receive the necessary attention, and their mechanical resistance has also been reassessed against the strictest criteria.

Throughout the period covered by this report, power plant licensees have continued to train the plant employees involved in its operation. The emergency drills carried out during the last few years have considered theoretical scenarios beyond the design basis in which situations requiring the use and application of Severe Accident Management Guides were reached.

As final summary, it is worth highlighting that appropriate measures have been adopted so that the design of nuclear facilities and their operation is carried out counting on several reliable levels and methods for protection against emissions of radioactive matter and for preventing accidents and mitigate their radiological consequences in case they were to occur. For all these reasons, Spain is deemed to meet the commitments of this Article

Article 19. Operation

19.1 Significant Licensee Activities in relation to nuclear power plant operational safety review

During the period covered by this report, Spanish nuclear power plants have not introduced modifications leading to power up grading. Since 1990, the increase of installed gross electrical power has thus remained at the 574 MWe power level referred to in the previous report. However, as indicated in Section 14.2, in order to calculate the total gross electrical power of Spanish facilities, the 150.1 MWe of José Cabrera NPP have to be deducted since April 30th, 2006, date on which it ceased to operate. As of December 31st, 2006, the gross electrical power of all Spanish nuclear power plants amounts to 7,727.9 MWe.

In 2005, Cofrentes NPP obtained the CSN's authorisation to extend the operating cycles from 18 months, implemented since 1991, to 24 months, for reasons related to the optimisation of radiation protection, the efficiency of operation, and a better adaptation to the scheduling of the national electricity grid. In order to obtain this authorisation, Cofrentes NPP conducted an exhaustive safety analysis in which the effect on safety of the extension of the surveillance interval of each requirement of the Improved Plant Technical Specifications (IPTSs), the Manual of Operation Requirements (MOR) and the Outside Dose Calculation Manual (ODCM) was individually evaluated; the historical data of the last six operation cycles was reviewed for each affected IPTS, MOR and MCDE requirement so as to confirm the conclusions of the previous evaluations associated with each test by assessing the effect of the new surveillance frequency on safety; and the compliance with the Licensing Bases for the affected functions was checked. The conclusion was that the impact on safety of the cycle extension was insignificant and that it still met the licensing basis.

In the last few years, licensees have devoted important efforts to the search for their own methodology for establishing the philosophy, principles, and requirements of system validation for the in-service inspection (ISI) of Spanish nuclear power plant components. Validation is understood as the systematic evaluation with the methods required to obtain a reliable confirmation that a Non-Destructive Testing (NDT) method is capable of guaranteeing the required performance under real inspection conditions, as defined in "*European Methodology for Qualification (second issue)*", (ENIQ Report no. 2, EUR 17299 EN, 1997) and "*Common position of European Regulators on Qualification of NDT systems for pre- and-in-service inspection of light water reactor components*", Revision 1 (EUR 16802 EN, 1997). A position stance of Spanish nuclear power plants – accepted by the CSN – on the requirements called for in the validation of in-service inspection systems is defined in them. Said methodology (CEX-120) covers the technical and administrative scopes and the associated liabilities during the preparation, execution, and certification of the validation of in-service inspection systems, and it has received the CSN's generic favourable appraisal at UNESA's request, which will simplify the process of specific approval of its use by each of the plants that request it. The plants have worked in the development and application of said methodology with the establishment of the Validation Group (GRUVAL) and the Independent Verification Group (GROIV) and their activities in the qualification of ultrasound inspection tests. With regard to this matter, Trillo NPP has used the validation technique during the inspection of fuel assembly pins.

In the second half of the 1990s, Spanish nuclear power plants developed a research project for the application of Probabilistic Safety Assessment to In-Service Inspection. The final objective of the project was to have an application guideline – agreed by consensus and validated by the CSN and Spanish nuclear power plants – that included both the methodology to be used and the minimum documentation and presentation requirements of the new in-service pipe inspection programme, based on risk information from the Spanish nuclear power plants that would want it, as well as the basic aspects of its assessment by the CSN, to allow an immediate implementation thereof. The completion of said project in 1999 has lead to Almaraz, Ascó, Vandellós II and Cofrentes nuclear power plants having implemented or being in the process of implementing its results after obtaining the appropriate authorisations from the CSN, applied to class 1 pipes and, additionally, to class 2 pipes in the case of Cofrentes NPP.

Likewise, Spanish nuclear power plants have developed and implemented Risk Monitors, as PSA applications, for risk management during maintenance operations. PSA applications have also been put into practice for prioritising motor operated valves (MOVs).

PSA applications have been used at Trillo NPP in the assessment of maintenance during power operation, the feed & bleed of the primary, and the filtered venting of the containment.

In 2004, Cofrentes NPP carried out a study to identify all those systems/functions which, being risk significant, were not included in the Plant Technical Specifications (PTS) and which should thus be included in accordance with the 4th criteria of 10 CFR 50.36 (c). These systems/functions have been included in Cofrentes NPP PTS, and the surveillance criteria and the out-of-service time periods thereof have been established with the corresponding increase of the facility's safety.

In connection with maintenance, all Spanish nuclear power plants have already implemented the Maintenance Rule.

Additionally, as has been indicated in previous national reports, the plants have implemented the Reliability-Centred Maintenance (RCM). This programme, started in 1984 by the Electric Power Research Institute (EPRI) and with the participation of the Institute of Nuclear Power Operations (INPO), both from the USA, can be defined as a rational and documented analysis process for defining or improving the maintenance plans of a system based on the necessary reliability in said system and the use of a logical decision tree to identify maintenance requirements.

During this period, the plants continue to use this methodology to define, update and improve their maintenance plans, in some cases extending their application to systems outside the scope initially established in the "Maintenance Rule". In order to evaluate the implementation experience, it can be said that this technique is in a mature phase and is allowing to being to fruition the benefits that have caused its implementation, that is, the optimisation of resource allocation in favour of safety and availability.

As a result of the implementation of the new inspection and indicator system, SISC, inspired by the American ROP and already mentioned in Section 14.2, licensees have implemented at the plants a systematics for gathering information of such indicators for the CSN . These indicators entail the supervision and information about values related to plant operational safety. Also related to IPSS, the Corrective Action Programme (CAP) must also be mentioned since it constitutes a useful tool for managing operational safety and has been implemented in all plants, as indicated in Section 8.3.2.

All plants have reviewed the methodology to be followed for the treatment of degraded and non-compliance conditions of Spanish plants in order to ensure that their operation,

faced with these situations, is done with the proper safety guarantees. Said methodology has been jointly agreed with the CSN.

As a result of the event occurred in the essential service water system of Vandellós II NPP on August 25th, 2004, the CSN required a series of actions from both the licensee of the facility and the other Spanish nuclear power plants.

As far as the licensee is concerned, ANAV issued and Action Plan aimed at improving safety management, which received the CSN's favourable appraisal. Said Plan envisages a total of 36 improvement actions aimed at strengthening Safety Culture and improving the technical infrastructure of the Plant. Some of the actions undertaken, given that they have an effect on the corporate activities shared by the two plants operated by ANAV – Vandellós II NPP and Ascó NPP – also affect this last plant. The actions, some of which represent a project by themselves due to their relevance, have been grouped in five programmes: Management and Leadership; Organisation; Management Systems; Communication; and Design Improvement, Inspections and Surveillances, with the following objectives:

- Management and Leadership Programme: the purpose of this programme is to improve management quality and strengthen the managerial leadership in the organisation through the promotion of the systematic practice of behaviours consistent with the values stated by ANAV and the application of a management style based on the definition and monitoring of objectives and the involvement of the collaborators in the improvement of their own duties and those of their units.
- Organisation Programme: its purpose is to carry out the necessary changes in ANAV's organisation – functions, composition of collegiate bodies, encouragement of delegation practices, etc. – so as to ensure its adequate operation, mainly in the areas directly implicated in safety and quality promotion.
- Management System Programme: its purpose is to strengthen ANAV's management systems by means of the improvement, in some cases, and the creation, in other cases, of the managerial procedures that regulate and support safety-related actions.
- Communication Programme: the purpose of this programme is to contribute from the communication side to reinforcing safety culture, providing the different actions carried out as regards communication with rigour and planning so as to ensure the involvement and commitment of workers with safety, improve the coordination between departments and facilitate communications with the main interest groups involved in the Action Plan (CSN, workers, owner companies, etc.).
- Design Improvement, Inspection and Surveillances Programme: its purpose is to perform the necessary actions to ensure a high reliability of the equipment and the short-, medium- and long-term Management of Assets, as well as to plan and carry out the Design Modification Projects in ESCs that are deemed necessary.

The CSN is closely monitoring the implementation of this Plan.

With regard to the rest of plants and the impact of this event on their activities related to checking their operational safety, in 2005 and 2006 all of them performed the analyses requested by the CSN, already described in Section 18.1. Additionally, all have carried out a safety assessment conducted by an independent external organisation.

19.2 Nuclear Power Plant Operating Experience Review Programme and Results Obtained

Among the documentation that licensees have to send to the CSN according to the legal provisions is the documentation relating to operating experience. Additionally, the periodic

safety reviews have entailed an exhaustive review of, among others, the analyses of both own and external operating experience. The scope of the analysed events, their applicability to the plant, the set of corrective actions derived from this analysis and, lastly, the state of implementation have been assessed in these reviews.

Since 1994, the CSN maintains a programme of operating indicators that has served to track the historic evolution of each indicator at Spanish facilities individually or as a whole. These indicators, older than those of the SISC set forth in Section 19.2, are kept because they represent a historical nuclear facility assessment series is deemed convenient to maintain.

This programme takes into account the following indicators:

- Average of automatic scrams with the reactor in a critical condition.
- Average of safety system actions.
- Average of significant events.
- Average of safety system failures.
- Average rate of forced shutdowns.
- Average forced outages due to per equipment failure per every 1000 commercial critical hours.
- Average of collective exposure to radiation.
- Among the main findings of the programme, the following is to be highlighted:

In the long term, all indicators, except the *Average of significant events* and the *Average rate of forced shutdowns*, display a decreasing trend over the 10 years analysed:

- *Average of automatic scrams with the reactor in critical condition*: The decreasing trend of this indicator is sustained in the long term. The short-term results are slightly on the rise due to the upturn of 2006, greater than the value of 2005, which leads to think of a stabilisation for next year depending on the results of 2007.
- *Average of safety system actions*: This indicator retains its favourable, decreasing long-term trend – a response that also appears in the medium term – which is an advantageous fact and allows the long- and short-term evolution of this indicator to be considered satisfactory.
- *Average of significant events*: A substantial rise of this indicator has been observed in 2006 – which noticeably deviates from the average (0.97 significant events per reactor and year) – due to the notification by NPPs in said year of some latent events caused by deficiencies that potentially could have affected several safety redundancies/systems and which, as a result, have fulfilled the criteria to be classified as significant but the real impact of which on the operation has been very low. This is due to the criteria for declaring significant events being very strict; frequently incidents that do not have an appreciable impact on plant risk must, however, appear as significant. This statement is corroborated by the fact that no notified events have been classified in 2006 as being of a level above 0 in the INES scale. Nevertheless, this indicator and its contributing factors will be specially monitored. The increasing trend of this indicator is maintained in the long and short terms.
- *Average safety system failures*: The indicator displays an evident decreasing trend in the long term, a phenomenon that is also observed in the short term. Thus, the conclusion is that its evolution is favourable.

- *Average rate of forced outages*: This indicator retains a increasing trend. It also displays an increasing evolution in the short term. Whereas the value corresponding to 2005 significantly increased owing to the lengthy forced shutdown of Vandellós II as a result of the corrective actions after the rupture of the essential service water manhole, in 2006 the shutdowns of this same plant in April (699 hours due to loose parts being located within the pressure barrier) and September (647 hours in order to substitute the split pins of the reactor control rod guide tubes) have been the main contributing factors. Because the deviation of the indicator is specific and justified, a special monitoring of its evolution is not deemed necessary.
- *Average of forced outages due to per equipment failure per every 1000 commercial critical hours*: This indicator retains its growing long-term trend, whereas that in the short term an increase is observed due to the same reasons mentioned for the previous indicator. Its trend is considered favourable.
- *Average of collective exposure to radiation*: This indicator maintains its decreasing long-term trend and tends to stabilise in the short term.

19.3 Regulatory control of Licensee Activities. Nuclear Power Plant Operation Inspection and Tracking Programme

As far as the regulatory control is concerned, the CSN has implemented a new programme for supervising and tracking nuclear power plants in operation called "Integrated Plant Supervision System" (SISC). This new system uses more safety-focused and objective criteria to evaluate plant operation and attempts to regulate it in a more efficient and effective manner, taking into account the CSN's experience in the 25 years since its creation.

The CSN decided to adapt to Spain the Reactor Oversight Program (ROP) of the US Nuclear Regulatory Commission (NRC), as the CSN considers it a well-argued and documented model, applicable to Spain.

Like the ROP, the main features of the SISC are:

- It concentrates the inspecting effort on areas with a greater potential risk.
- It pays greater attention to the worst performing plants.
- It uses objective measures of plant operation.
- It provides fast, understandable and predictable assessments on plant operation.
- It reduces unnecessary regulatory load at plants.
- It responds to deviations or failures to comply in a predictable and risk-proportional manner.
- It increases the transparency of the supervisory processes.

Its main characteristic is that it uses new operation inspection methods – more focused on performing direct observations and observing results – as well as new operation evaluation methods. It specifies in a clearer manner what can an operator with a good operation expect from the CSN and what can it expect if that operation worsens.

The Pillars of Safe Operation

Three strategic areas – nuclear safety, radiation protection, and security – and seven safety pillars, linked to the previous and comprising the essential aspects of the facility's operational safety, are established for plant operation supervision. Satisfactory results in all seven pillars provide a reasonable guarantee that the CSN's mission is being fulfilled

without the need for additional actions; otherwise, it will be necessary to adopt the measures described below in the Action Matrix.

The seven pillars of safe operation are:

- Initiating events: limiting the frequency of events.
- Core damage mitigation systems: availability, reliability and capability.
- Barrier integrity: fuel cladding, pressure boundary, and containment.
- Emergency preparedness: correct performance in drills and real emergencies.
- Radiation protection of the public: liquid and gaseous effluents, inadvertent release of radioactive solids, environmental radiological monitoring, and radioactive transports inside the facility.
- Occupational radiation protection: area access control, radioactive material control, and application of the ALARA criterion.
- Security: design-basis threat, and radiological sabotage. This pillar, despite being part of the CSN's inspection and control programme, is dealt with specifically due to the necessarily confidential treatment of its results.

In addition to the seven pillars there are three transverse areas, which are common to all of them:

- Human Behaviour
- Safety Culture
- Corrective Action Programme

The deficiencies in these transverse areas also appear as deficiencies in the pillars and are often their root causes.

SISC Elements

1. Performance Indicators

The SISC is a system that is intended to be as objective as possible. Thus, a performance indicator has been developed for each safety aspect that can be reasonably quantified. These indicators provide an objective indication of the key attributes of plant operation but have to be complemented by inspections since they do not cover all aspects of interest.

13 indicators, distributed among the 7 safety pillars, have been developed, which are displayed below.

Table 1.- SISC Performance Indicators

PILLAR	INDICATOR
Initiating Events	I1.- Unscheduled, instantaneous reactor scrams per every 7000 hours with the reactor in critical condition I2.- Unscheduled reactor outages with loss of the normal removal of residual heat I3.- Unscheduled power changes per every 7000 hours with the reactor in critical condition
Mitigation Systems	M1.- Mitigation System Performance Index (MSPI) of each of the systems most significant for safety M2.- Functional failures of safety systems
Barrier Integrity	B1.- Specific activity of the reactor coolant system B2.- Reactor coolant system leaks
Emergency Preparedness	E1.- Response when faced with drills and emergency situations E2.- Emergency Organisation E3.- Facilities, Equipment and Means
Occupational Radiation Protection	O1.- Effectiveness of the control of occupational exposure
Radiation Protection of the Public	P1.- Radioactive Effluent Control
Security	Its definition and use are still to be decided

Thresholds limiting the acceptable operation values are defined for each indicator. These values delimit the acceptable operating bands according to a colour code: green, white, yellow, and red. These thresholds are based on Probabilistic Safety Assessment (PSAs), particularly in the strategic area of nuclear safety.

When obtaining numeric values related to risk is not possible, they are based on the opinion of experts or on regulatory requirements. Their calculation and reporting take place every three months.

The "green" band indicates an operation within the expected in which safety pillar objectives are satisfied. A "white" band indicates an operation outside the expected range, but the objectives of its safety pillar are still met. A "yellow" band indicates that the objectives of its safety pillar are still fulfilled although with a slight reduction of the safety margin. A "red" band indicates a significant reduction of the safety margin in the area measured by the performance indicator.

2. Inspection Programme

It is designed to cover safety-, reliability-, and risk-significant activities, as well as other activities that require a special attention. The findings are assessed following a process for determining the significance for safety and are categorised according to the same colour code than performance indicators: green, white, yellow, and red. The programme comprises the following parts:

- Basic Inspection Programme (BIP): It is a minimum, risk-informed programme that is mainly carried out by resident inspectors. It covers all safety pillars such that each one of them has indicator and inspection information as well as the three transverse areas. It includes, among others, areas not covered by indicators and the verification that the values of the operator-reported indicators are correct.
- Additional Plant-Specific Inspections: they are conducted when there are relevant findings or when indicator thresholds are exceeded. They are more directed at diagnostics and vary in scope and depth.
- Inspections in response to or to monitor events. They vary in scope and depth.

In short, the system is regulated by a management procedure, PG.IV.07.-Integrated Plant Supervision System (SISC), as well as by ten administrative procedures, forty two technical procedures and ten finding-significance categorisation procedures.

Result Evaluation

The purpose of the evaluation programme is to carry out an overall evaluation of the operation of each plant. The CSN continuously supervises plant operation and the established actions will be adopted in case that any safety-relevant inspection finding takes place or some performance indicator exceeds a threshold. In all the assessments, the operation level of the plant is checked in accordance with the Action Matrix, and the actions established in it will be adopted according to said level.

Each quarter, a plant operation assessment is carried out using the data of performance indicators and inspection findings.

An overall check is done annually, the additional purpose of which is to verify the diligence of the operators in applying the actions derived from the deficiencies detected. The conclusions of this evaluation are formally presented on-site by the CSN to the management staff of each plant, with which the operation of the plant during the last year is discussed.

The results of the quarterly checks are documented and notified to the licensee by means of a letter in which the column of the Action Matrix in which each plant is located is indicated.

Table 3.- CSN's Action Matrix

Plant Operation	CSN's Response
Licensee's Response	
All indicator and inspection results are green	To maintain the base inspection programme and other SISC elements
Regulatory Response	
1 or 2 white results in different safety pillars and no more than 2 white results in a strategic area	Meeting with the Licensee Root cause analysis and corrective actions of the Licensee supervised by the CSN Base programme supplemented with an additional inspection on root cause analysis and derived actions Technical Instruction from the CSN
Degraded Safety Pillar	
1 degraded safety pillar (2 white results or 1 yellow result) or 3 white results in a strategic area	Meeting of the CSN's management staff with that of the plant Inspections necessary for an independent assessment by the CSN of the extent of the problems, the identification of the causes, and the actions of the Licensee Self-assessment by the Licensee to identify the root cause of the collective problems. CSN supervision
Multiple/Repeated Degradations	
Several degraded safety pillars, several yellow results, a red result or a degraded pillar for 5 or more quarters	Meeting of the CSN with plant management or the persons in charge of the owner companies Licensee's Analysis and Improvement Plan to correct the problems; it can be carried out by an independent third party. CSN supervision Base programme supplemented with a root cause analysis performed by the CSN The CSN requires from the Licensee an improvement plan which it will be evaluated
Unacceptable Operation	
Unacceptable overall operation. Plant operation is not allowed.	CSN Plenary Meeting with the persons in charge of the companies that own the facility A favourable report from the CSN is needed for the plant to resume operation. The CSN will conduct as many inspections and analyses it deems necessary to issue this Report

Integrated Plant Supervision System (SISC) Implementation

On 15th September 2004 the CSN approved that the NRC's Reactor Oversight Program and the implementation programme thereof be adapted to Spain.

On 6th July 2005, the CSN approved the SISC implementation deadlines: pilot phase until 31st December 2005; effective implementation on 1 July 2006; and notification of the results to the public from 1st January 2007 on. On 6th July 2005, a letter was sent to all plant licensees informing them of this SISC implementation timetable.

The application of the IPSS has required the adaptation of the ROP methodology to Spain, taking into account that there are certain differences with the USA and the NRC – from the American legal framework to the NRC's organisational structure. The set of indicators is similar to that of the ROP; however, some inspections have been included in the inspection programme that were already part of the previous inspection programme and have been deemed relevant to keep. These inspections are the structure, system, and component lifetime (ageing) management inspection; the organisation and human factor inspection; and the Probabilistic Safety Assessment (PSA) maintenance inspection.

19.4 Activities Related to the Management of Radioactive Waste and Spent Fuel at the Nuclear Power Plant Sites

On 23rd June 2006, the Cabinet of Ministers approved the 6th General Radioactive Waste Plan, which describes the current and foreseen generation of radioactive waste in Spain, the technical approaches and the economic and financial aspects of waste management, and represents the reference framework for the strategies to be implemented by the Public Enterprise in charge of Radioactive Waste Management (ENRESA).

Article 20 of the Nuclear and Radioactive Facility Regulations – approved by Royal Decree 1836/1999, of 3rd December, relating to the documentation to be submitted by nuclear facility licensees in order to request the operating permit – establishes that licensees must submit a Radioactive Waste Management Plan that incorporates, as the case may be, the contracts established with managing companies and includes, among other concepts, a system for the possible clearance of radioactive waste.

The purpose of the Radioactive Waste Management Plan is to gather the criteria and instructions that ensure that the management of the radioactive waste generated in these facilities is safe and optimised considering the advances in regulations and technology. It must also guarantee that no radioactive wastes are disposed of in a conventional way.

In order to analyse the most appropriate content and scope of waste management plans, the CSN promoted in 2001 the creation of a working group made up of representatives from UNESA, ENRESA and the ENUSA Industrias Avanzadas, S.A. Company. The work done by the group has allowed the objectives and contents of this Waste Management Plan to be precisely defined.

The pilot application of the document prepared on the waste management plan of José Cabrera nuclear power plant was completed in 2005. The conclusions and lessons learnt have contributed to its improvement and facilitated its subsequent implementation in the other facilities by means of the preparation of a Nuclear Safety Council Safety Guide.

Nevertheless, during the Radioactive Waste Plan guide editing process, the creation of a specific working group made up by representatives of the CSN, UNESA, ENRESA and the ENUSA Industrias Avanzadas, S.A. company was deemed of interest in order to study the contents of the guide in connection with High Level Waste and Spent Fuel.

After adding the comments provided by this group to the guide, the latter will be finally published during the current year, 2007. On the other hand, the execution of a pilot

project for the application of the guide in relation to the spent fuel at Ascó and Santa María de Garoña nuclear power plants has been decided, as for low- and intermediate-level waste. The lessons learnt from this pilot project will be included in future reviews of the guide.

Although the new waste management plans prepared in accordance with the guide have not been authorised yet, some of the planned improvements have already been materialised in Spanish nuclear facilities according to the objectives that prompted their writing.

On the one hand, it can be said that what has been called *the second line of defence* – consisting of the radiological control infrastructures and processes necessary to strengthen the guarantees associated with the objective that no radioactive wastes are managed in a conventional manner – has already been implemented in almost all of Spanish nuclear power plants for the control of residual materials.

On the other hand, improvements in the systematics and analysis of the information relating to radioactive waste management have also been made in order to reveal in a more precise manner the waste for which a management method is not defined yet or for which improvement actions can be implemented in its current management.

Present predictions indicate that, since the publication of the guide on radioactive waste management plans, which is currently in the public commentary phase, all Spanish nuclear facilities will prepare new plans so that their definitive implementation will likely be complete in 2008.

19.5 Degree of Compliance with the Obligations of the Convention

As indicated in the previous national reports, Spain met the requirements of the Convention as far as the operation of nuclear facilities is concerned. With the modifications made during this period and described in the previous paragraphs, Spain may be said to have improved its degree of compliance with the requirements established in this article.

Appendix 19.A

Standardised operating permit model

A Letter to the Minister of Industry, Tourism and Trade

SUBJECT: RENEWAL OF THE OPERATING PERMIT FOR _____ NUCLEAR POWER PLANT

On _____(date)_____, the CSN received from the Directorate General for Energy Policy and Mines of the Ministry of Industry, Tourism and Trade, with its document dated on..... (entry register no.....), the request for the renewal of the operating permit, for ten years, of _____ nuclear power plant, to which Chapter IV of the Regulations on Nuclear and Radioactive Facilities refers to. A year in advance of the expiration of the current permit, in accordance with Condition ___ of Appendix I of the Ministry Order of _____ __, _____, and the licensee submitted the plant's safety and radiation protection reassessment, known as a Periodic Safety Review.

The CSN has continuously monitored and supervised the operation of the aforementioned plant during the period of validity of the current Permit and the compliance with the applicable conditions on nuclear safety and radiation protection. Likewise, the Periodic Safety Review submitted by the licensee corresponding to the last years, from _____ to _____, has been evaluated, in which an analysis of the operating experience of the plant, the analysis of equipment performance, the analysis of the impact of the new applicable regulations, the results of the probabilistic safety assessment, and the safety improvement plans initiated by the licensee were included.

The Nuclear Safety Council, at its meeting of _____ __, _____, has analysed the request submitted by {Licensee} as well as the report drawn up by the Technical Directorate of Nuclear Safety on the basis of the evaluations performed, and has agreed to issue its favourable determination regarding the renewal of the operating permit for a period of __ years, provided the operation meets the limits and conditions included in the Appendix. This agreement has been reached in compliance with Section b) of the 2nd Article of Law 15/1980, modified by the first additional stipulation of Law 14/1999, and is submitted to that Ministry for the appropriate purposes.

Madrid, _____

THE PRESIDENT

B Limits and Conditions on Nuclear Safety and Radiation protection associated with the Operating Permit

1. For the purposes provided for in the current legislation, the _____ company is considered the licensee of this permit and operator in charge of _____ Nuclear Power Plant.
2. The present Operating Permit authorises the licensee to:

   2.1. Possess and store slightly-enriched uranium fuel assemblies, in accordance with the technical limits and conditions contained in the Safety Analysis Report on the Refuelling of each cycle and with the limits and conditions associated with the specific, fresh and irradiated fuel storage authorisations.

   2.2. Operate the plant up to _____ MWt of thermal power.

   2.3. Possess, store, and use radioactive materials, nuclear substances, and radiation sources as required for the operation of the facility.

3. The permit is granted on the basis of the following documents:

   a) Safety Analysis Report, Rev. _____.

   b) Operating Regulations, Rev. _____.

   c) Plant Technical Specifications, Rev. ____.

   d) On-Site Emergency Plan, Rev. ___.

   e) Quality Assurance Manual, Rev. ____.

   f) Radiation Protection Manual, Rev. ____.

   g) Radioactive Waste Management Plan, Rev. ____.

   The operation of the plant will be carried out in accordance with the previous documents, in their current review, by following the update process indicated below.

   3.1 Subsequent modifications or changes to the Operating Regulations, the Plant Technical Specifications, and the On-Site Emergency Plan must be approved by the Directorate General for Energy Policy and Mines, following a report from the Nuclear Safety Council, prior to their coming into effect. The Nuclear Safety Council may temporarily exempt from complying with some section of the documents mentioned in the previous paragraph, informing the Directorate General for Energy Policy and Mines of the start and end of the exemption.

   3.2. Six months after the start-up following each refuelling outage, the licensee shall review the Safety Analysis Report that incorporates the modifications included in the plant from the beginning of the previous cycle to the end of said refuelling that have not required authorisation according to that established in Condition 4.1 and the new safety assessment performed. This new revision shall be submitted to the Directorate General for Energy Policy and Mines and to the Nuclear Safety Council in the month following its coming into effect.

   Safety Analysis Report reviews corresponding to modifications that require an authorisation from the Directorate General for Energy Policy and Mines, in accordance with Condition 4.1, shall be authorised simultaneously with the modifications.

   3.3. Modifications to the Quality Assurance Manual may be performed under the responsibility of the licensee provided the change does not reduce the commitments contained in the current quality assurance programme. Changes that reduce commitments must be approved by the Nuclear Safety Council prior to their coming

into effect. Commitments are understood as being those included in the current Quality Assurance Manual in the form of applicable regulations and guides, as well as the description itself of the programme reflected in the contents of the Manual, as specified in the complementary technical instructions issued in this respect by the Nuclear Safety Council.

Reviews of the Quality Assurance Manual shall be submitted to the Directorate General for Energy Policy and Mines and to the Nuclear Safety Council within one month of their coming into effect.

3.4. Modifications to the Radiation Protection Manual may be carried out under the responsibility of the licensee, except in those cases that they affect basic radiation protection standards or criteria, as specified in the complementary technical instructions issued in this respect by the Nuclear Safety Council. In these cases, the approval of the Nuclear Safety Council shall be required prior to their coming into effect.

Radiation protection Manual revisions shall be sent to the Directorate General for Energy Policy and Mines and to the Nuclear Safety Council within one month of their coming into effect.

3.5. Modifications to the Radioactive Waste Management Plan may be carried out under the responsibility of the licensee, except in those cases indicated in the complementary technical instructions issued by the Nuclear Safety Council. In these cases, the favourable approval of the Nuclear Safety Council shall be required prior to their coming into effect.

4. The following is required in connection with modifications to the design or the operating conditions and tests to be conducted at the plant:

4.1. Modifications to the design or operating conditions affecting the nuclear safety or radiation protection of the facility, as well as the performance of tests thereat, shall be previously analysed by the licensee in order to verify whether the criteria, regulations, and conditions on which the present license is based are still fulfilled, as specified in the complementary technical instructions issued in this respect by the Nuclear Safety Council.

If from the analysis carried out by the licensee it is concluded that the requirements listed in the previous paragraph are still guaranteed, the licensee may conduct the modification or test, informing the Directorate General for Energy Policy and Mines and the Nuclear Safety Council of its performance, as established in Condition 5.

In case the design or operating condition modifications or the performance of tests entail a modification of the criteria, standards, and conditions on which the Operating Permit is based, the licensee shall request from the Ministry of Industry, Tourism and Trade a modification or test authorisation, which shall become effective prior to the modification coming into effect or the performance of the test. The request will be accompanied by the documentation specified in the complementary technical instructions issued in this respect by the Nuclear Safety Council.

4.2. Design modifications, the implementation of which entails a significant interference in the operation of the facility or whose associated tasks are deemed to entail collective doses above 1 Sv.person, shall be approved by the Nuclear Safety Council prior to their execution, and to this end documentation similar to that indicated in previous Point 4.1 will be sent. Significant interference with the operation is understood as a case when the work required for the facility or verification of the modification may cause plant transients or damages to safety equipment or entail a reduction of the capability of the personnel to operate the plant safely.

5. During the first quarter of each calendar year, the licensee shall submit to the Directorate General for Energy Policy and Mines and the Nuclear Safety Council reports on the following aspects, with the scope and contents specified in the complementary technical instructions issued in this respect by the Nuclear Safety Council:

   5.1 In house and industry experience applicable to the facility, describing the actions adopted to improve the performance thereof or to prevent similar events.

   5.2. Design modifications planned, implemented or being implemented at the plant. When a design modification not included in the last annual modification report is expected to be implemented during the refuelling, a report including said modifications and having the same scope and contents as the annual report will be sent to the CSN three months prior to the date scheduled for the start of the activities of the corresponding outage.

   5.3. Measures taken to adapt the operation of the plant to the new national requirements on nuclear safety and radiation protection and to the standards of the country of origin of the project. In this last case, an analysis of the applicability to the plant of the new requirements issued by the regulatory body of the country of origin of the project for plants of a similar design shall be included.

   5.4. Activities of the programme for training all plant personnel whose work might have an impact on nuclear safety or radiation protection.

   5.5. Results of the environmental radiological surveillance programme. The information included must be suitable for detecting possible increases in activity above the radiological background and for determining whether the possible additional activity is the result of plant operation.

   5.6. Results from dosimetry controls of operating personnel, including an analysis of the trends of individual and collective doses received by the staff during the previous year.

   5.7. Activities of the radioactive waste management plan, including the activities regarding very low-level waste that can be managed as conventional waste, low- and intermediate-level wastes, and high-level waste as well as irradiated fuel.

6. The exit of packages of radioactive waste and fissionable materials from the plant site shall be communicated to the Directorate General for Energy Policy and Mines and to the Nuclear Safety Council at least seven days in advance of the exit date. The departure of other radioactive packages will be communicated within 24 hours from the decision to transport and, in any case, prior to it being carried out. The exit of radioactive packages from the plant site will be subject to the authorisation system established by current regulations.

   When the licensee is responsible for the transports of fissionable materials for which the plant is the point of origin or destination and no authorisation is required due to the sum of the transport indexes of all packages of the shipment being lower than 50, the expected number of said transports shall be additionally communicated to the Directorate General for Energy Policy and Mines and to the Nuclear Safety Council three months in advance of the scheduled date.

7. Within the first six months of every calendar year, the licensee shall send to the Directorate General for Energy Policy and Mines and to the Nuclear Safety Council a report on plant lifetime management activities that includes the surveillance of the mechanisms of ageing and degradation of safety-related structures, systems, and components and the status thereof, and in which the new inspection, surveillance, and maintenance activities incorporated in order to detect said mechanisms and control their effects are identified.

The scope and contents of lifetime management activities will comply with those specified in the complementary technical instructions issued in this respect by the Nuclear Safety Council.

8. The licensee may request a new permit from the Ministry of Industry, Tourism and Trade for a period no greater than 10 years a minimum of ____ years in advance of the expiration of the present operating permit. The request will be accompanied by: (a) the last reviews of the documents to which Condition 3 refers to; (b) a Periodic Safety Review of the plant in accordance with that specified in the complementary technical instructions established by the Nuclear Safety Council; (c) a review of the probabilistic safety assessment; (d) an analysis of the ageing experienced by the plant's safety components, systems, and structures; and (e) an analysis of the operating experience accumulated during the period of validity of the permit intended to be renewed.

9. If during the period of validity of this permit the licensee were to decide to cease the operation of the plant, it shall communicate this decision to the Directorate General for Energy Policy and Mines and to the Nuclear Safety Council at least one year in advance of the scheduled date, unless such cessation is due to unforeseen causes or to a resolution by the Ministry of Industry, Tourism and Trade. The licensee shall justify the nuclear safety of the facility and the radiation protection of the personnel which the operations to be performed at the facility from the cessation of the operation to the granting of the dismantling authorisation must meet, as specified in the complementary technical instructions issued in this respect by the Nuclear Safety Council.

10. The licensee shall measure the efficiency of the maintenance practices conducted at its plant with respect to previously set objectives, such that the capacity of the structures, systems, and components thereof for performing their expected functions is ensured, following the complementary technical instructions issued by the Nuclear Safety Council, dated February 15th , 1999. *(In the case of Trillo, it was requested of it in 2002.)*

11. Before each refuelling outage, the licensee will submit to the Directorate General for Energy Policy and Mines and to the Nuclear Safety Council a Refuelling Safety Review and a report on the activities to be carried out during the outage, following the complementary technical instructions issued in this respect by the Nuclear Safety Council.

12. During the period of validity of this permit, the licensee shall put into practice the Plant Safety Improvement Programmes identified in the Periodic Safety Review conducted by the licensee in support of the request for the present permit, in the periods defined for each one of them in the submitted report and those specified in the complementary technical instructions issued in this respect by the Nuclear Safety Council.

13. The Nuclear Safety Council may send complementary technical instructions directly to the licensee in order to guarantee that the safety conditions and requirements of the facility are maintained and to better comply with the requirements established in the present permit.

Conclusions

Of the Nuclear Safety Council

With a view to underlining the most significant aspects of the period, providing an overall view of our efforts to ensure safety and responding to the objective of self-assessment that this report implies, the Nuclear Safety Council, as the only organisation responsible for nuclear safety and radiation protection in Spain, presents in this section its conclusions regarding the period July 2004 to December 2006 and outlines certain future challenges.

The Spanish nuclear power plant fleet has changed since the last review meeting of the third national Report on the Convention on Nuclear Safety. On 30th April 2006, the José Cabrera NPP operating permit expired and, from that date, the activities required to remove the spent fuel are under-way and later the activities associated to the permanent cessation of operations and dismantling will be undertaken.

Throughout this period, since the last revision of the Convention, the Regulatory Body has carried out a project for the development of a Strategic Working Plan, the first milestone of which has been the definition of the following:

- The mission of the organisation, in terms of nuclear safety and radiation protection, achievement of which is linked to the performance of the licensees and personnel of the facilities.
- The vision, making clear the independence, technical qualification, rigour, efficiency and transparency required to obtain the confidence of the society and become a point of reference.
- The strategic lines of action: safety, efficiency and credibility, which, supported by the mission and vision, have made possible to identify strategic objectives for action such as development of the regulatory framework, development of the safety management model, the improvement of the efficiency and effectiveness of internal processes, the increased confidence between the CSN and its clients, the improvement of the emergency organisation and planning and the improvement of the communication.

In relation to the development of the regulatory framework, work has been performed in several areas:

- First, it must be highlighted that, during 2007, the Spanish Parliament has discussed the modifications to the *Law on the Nuclear Safety Council,* reforming the Law 15/1980. The priority objective of the reform is to update the operation of the CSN, after the elapsed time since its creation, contemplating some organizational and functional changes, incorporating mechanisms to improve the transparency of the processes of information and communication to the general public, and regulating the procedure enabling the workers of the nuclear installations to report failures and deficiencies on safety matters to the CSN.

  After the approval of the aforesaid Law, the *Law 25/1964, Nuclear Energy Act*, will also experience some reforms related to the update of the regime of infractions and sanctions on nuclear matters, contemplating a better description of the behaviours and

an increase of the economic fines, further to revising technical aspects (types of nuclear facilities, etc.) that due to the advances on scientific research had to be updated,

- In the period covered by the fourth national report, a series of rules have been approved developing the government directives and CSN participation in nuclear emergency planning matters, regulating the competences of the different authorities in such situation:
  - Royal Decree 1546/2004, of 25th June, approving the Basic Nuclear Emergency Plan (PLABEN).
  - Order INT/1695/2005, of 27th May, of the Ministry of the Interior, approving the Nuclear Emergency Plan for the Central Response and Support Level. (PENCRA)
  - Resolution of 14th June 2006 of the Under-secretariat of the Ministry of the Interior, providing for the publication of the Agreement of the Council of Ministers, of 9th June 2006, approving the Master Plans related to the Nuclear Emergency Plans outside nuclear power plants.
- CSN Instructions. Six Instructions have been issued, which are listed below indicating their contents:
  - INSTRUCTION IS-08, of 27th July 2005, of the Nuclear Safety Council, on the criteria applied by the Nuclear Safety Council to request specific advise on radiation protection from the owners of the nuclear and radioactive facilities.
  - INSTRUCTION IS-09, of 14th June 2006, of the Nuclear Safety Council, establishing the criteria to be applied for the systems, services and procedures of physical protection for nuclear facilities and materials.
  - INSTRUCTION IS-10, of 25th July 2006, of the Nuclear Safety Council, establishing the criteria for reporting events to the Nuclear Safety Council by the nuclear power plants.
  - INSTRUCTION IS-11, of 21st February 2007, of the Nuclear Safety Council, on licenses for the operating personnel of the nuclear power plants
  - INSTRUCTION IS-12, of 28th February 2007, of the Nuclear Safety Council, on training of non-licensed personnel of nuclear power plants.
  - INSTRUCTION IS-13, of 21st March 2007, of the Nuclear Safety Council, on radiological criteria for the release of nuclear power plant sites.
- In this period, a set of Guides of the Nuclear Safety Council have been published dealing with the subjects listed below:

  Section 1: Power reactors and nuclear power plants.
  - GS-1.05. Documentation on refuelling activities at light water nuclear power plants. 1990. (Rev. 1, July 2004).
  - GS-1.09. Emergency drills and exercises at nuclear power plants. 1996. (Rev. 1, March 2006).

  Section 4: Environmental radiation surveillance. -
  - GS-4.02 Site restoration plan, 2007

  Section 7: Radiation Protection.-
  - GS-7.01. Technical-administrative requirements for personal dosimetry services. 1985. (Rev. 1, April 2006).
  - GS-7.05. Actions to be implemented in the case of persons affected by radiological accidents. 1989. (Rev. 1, May 2005).
  - GS-7.09. Manual for dose calculation outside nuclear power plants. April 2006.

Furthermore, during the third review meeting of the Convention on Nuclear Safety, Spain collected the opinions of the other contracting parties on the third Spanish report, in order to propose tasks for the future to be embodied in this fourth report. The progress made in these matters has been described throughout this Report, along with the improvement of the degree of compliance with the obligations of the Convention. This section summarises the initiatives and activities performed in response to the commitments adopted.

In relation to the development and improvement of the integrated management system of the CSN:

In the year 2006, the Spanish Government, through its Permanent Representative and at the instance of the Nuclear Safety Council, requested the IAEA that a Mission of an International Expert Group carried out an Integrated Regulatory Review Service (IRRS) with the aim of reviewing, with respect to the regulations and directives of the IAEA, the situation of the legislative and regulatory framework on nuclear energy in Spain, as well as the structure, performance and practices of the organizations having competence, particularly the functions of the CSN only competent organization on nuclear safety and radiation protection matters.

The CSN prepared and approved a Strategic Plan, spanning the period 2005 – 2010. Such Plan sets out the Mission and Vision of the CSN, summarises the environment analysis performed in order to prepare the Plan and establishes the expected results from the organization. The strategies laid down and the objectives associated to them are also described. Finally, the most significant activities to be carried out in order to achieve the objectives are included.

In order to prepare adequately the mission, the CSN initiated, at the end 2005, a self-assessment process using as reference the questionnaire IAEA-TECDOC-703 Edition 1993 Part II and the documents of requirements issued by the IAEA.

In March 2006, the CSN Plenary Meeting approved the final assessment report and, later, the action plan identifying the activities to be carried out to satisfy the IRRS mission requirements. Once this action plan was approved, an analysis was performed intended to define the initial actions to be taken and that made possible to identify the most important processes both for the CSN strategy and for the IRRS mission.

In February 2007, a preparatory meeting of the IRRS mission was held with IAEA representatives. This meeting was useful to define the final programme for the IRRS mission and consolidate the approved Action Plan.

In relation to maintaining the technical capability of the CSN:

The Annual Training Plan, established in the 90's, was integrated into the CSN Strategic Orientation Plan framework, the objective being to achieve the highest levels of qualification of the personnel and to cover the needs for adaptation to the required new working methods.

The Training Plan appears as a tool to help achieving CSN strategic objectives, as defined in the "CSN Strategic Plan", facilitating and promoting the fulfilment of the Mission and Vision of the CSN.

CSN strategy on training matters is the result of the accumulated experience as well as of the efforts made within the Training Coordinating Commission, created by the CSN in the Plenary Meeting of 3rd February 2004.

The publication of the Mission and Vision, as well as the Strategic Plan of the CSN, reoriented the training strategy to be in line with the later, and appearing as a tool for accomplishing the objectives of the Strategic Plan.

The effectiveness of the reoriented training enabled improving the development of the Plan for 2005 and is continued in document "General Strategy on Training Matters: Training 2006" (SG/PF06/01/Rev.2/Oct.05), approved by the Plenary Meeting of the CSN on 5th October. This strategy is materialized on the 2006 Training Plan proposal.

All the training activities were re-grouped into six areas, which have been developed throughout the four-year period:

- Nuclear Safety.
- Radiation Protection.
- Development of management skills, organisation and communication.
- Administration and management..
- Information systems.
- Languages.

The Plan has been assessed annually and different measures have been adopted to adapt it to the specific needs of the units, as requested.

In relation to the improvement of the efficiency of the Regulatory Body processes

In previous national reports, information was provided on the different programmes initiated to improve the efficiency of the regulatory process. It is worthy to point out as important aspects carried out in the period covered by the fourth national report, the following:

- The Plenary Meeting of the CSN approved document "Regulations Pyramid and Licensing Basis" as well as Conditions for Long-Term Operation of the Spanish Nuclear Power Plants. The Plenary Meeting also urged the implementation, both for the nuclear sector and for the CSN, of the actions for each of the analysed aspects.
- In relation to the improvement of the assessment processes and the streamlining of the process for exemption to the Technical Specifications and improvement of the quality of Licensees' documentation, the "Guide for preparation and assessment of requests for temporary exemptions to the Plant Technical Specifications (ETF)" was elaborated and later approved by the Plenary Meeting on 29 June 2005. Another guiding document was prepared, applicable to the licensees, setting up minimum quality requirements to elaborate the documentation to be submitted to the CSN.
- In relation to the Integrated Plant Supervision System (SISC) inspired on NRC's "Reactor Oversight Process" (ROP), the Plenary Meeting of the CSN approved its adoption as new system for supervising the operation of the nuclear power plants.

  The SISC has been subjected to a trial period enabling the CSN inspectors and the licensees of the installations to become acquainted with the new supervision system. The trial period started in the second half of 2005, being applied internally in an effective manner in 2006. This period has been useful to complete some pending aspects, put into practice the set of elements of the new supervision model and provide the required skills and confidence for the application of the new processes and indicators. Since January 2007, the system is fully operational.
- In relation to the Policies of the CSN and the Licensees, the document "Policies for CSN' Actions" was elaborated and submitted to the Plenary Meeting of the CSN at the end of 2004. Finally, the CSN-UNESA Liaison Committee approved it in January 2005.

  The document "Policy of the Licensees" was also elaborated, though in this case, being a generic guideline affecting the different plants; it required a later period for its specific incorporation to each plant.

In relation to the implementation of improvements in the reengineering processes and monitoring of the decommissioning of the facility for the commitment to safety:

In previous reports, information was provided on the systematic for the assessment and verification of the safety of the Spanish nuclear power plants and some remarkable aspects were identified which are still applicable; among them, the following:

- The implementation of a policy for granting operating licenses valid for 10 years has continued, preceded by a systematic review of the safety and radiation protection of the plant.
- The same systematic approach is considered to be equally valid for those cases in which the renewal of the Operating Permit exceeds the lifetime considered originally in the initial design of the facility. It is understood that in this case special conditions must be included, both administrative and related to the management of the ageing of the facility so that plant operation may be extended beyond the initial design lifetime.
- The boost of the Probability Safety Analysis Integrated Programme, its results and their use on risk-informed applications, entails an improvement of plant safety. The review and update of the probabilistic safety analyses and their application as support to risk-informed design modifications has been used to identify and improve the management and to dedicate the resources to aspects relevant for the safety of the facility.

In summary, Spain has adopted adequate measures for carrying out detailed, systematic and periodic safety assessments during the lifetime of the Spanish nuclear power plants. The Inspection model used constitutes a mechanism for the continuous review of the operating experience and safety situation of each facility.

Also, in the review meeting of the third national report, Spain committed itself to supply information on how to maintain the safety of the facilities in the cessation of operations phase.

- Once the cessation of operations of a nuclear facility has been declared and the operating permit has expired, it is necessary to proceed to the dismantling and declaration of decommissioning in order to be declassified and released from the regulatory control it has been subjected to. This final stage of the nuclear facility life starts with a new dismantling authorization enabling the licensee to initiate the decontamination activities, dismantling of equipment, removal of materials, to enable finally the total or restricted release of the facility site.
- Maintaining the safety throughout the technical-administrative process of dismantling and decommissioning nuclear facilities is based on two of the basic functions of the regulator: the previous authorization of the process, and the supervision and control of dismantling activities.

In relation to the realistic assessment of the dose that the population receives from NPPs operation:

Adequate measures are in force in Spain to ensure that the exposure of workers and general public to the radiations caused by a nuclear facility under all operating situations is kept as low as reasonably achievable and that no person is exposed to radiation doses in excess of the established dose limits.

During the period elapsed since the previous report, the following activities have been performed to improve the radiation protection area at the nuclear power plants:

- The methodology and criteria to be applied for performing a realistic assessment of the doses to the general public as a consequence of nuclear power plants operation have been defined, based on the recommendations included in the document of the

European Commission, Radiation Protection 129 «Guidance on the realistic assessment of radiation doses to members of the public due to the operation of nuclear facilities under normal conditions».

- As regards environmental radiological surveillance programmes, work continues on the analytical comparison exercises among laboratories performing environmental radioactivity measurements, the objective being to guarantee the homogeneity and reliability of the results obtained from these programmes. Standardised procedures are being developed for the different stages of the measuring process.
- The Plenary Meeting of the Congress of Deputies, on 9th December 2005, approved a non-legislative motion urging the Government that the Ministry of Health, through the Health Institute "Carlos III", performed an epidemiological study in the areas where the nuclear facilities are located and their areas of influence (depending on the wind regime, water streams, etc.) and analysing the influence of these facilities on the population health. Among other things, this non-legislative motion contemplates:

  a) the collaboration of the CSN in the aforesaid studies, to the extent to be determined, and specifically providing the information enabling the assessment of the population radiological exposure both from artificial origin (nuclear facilities) and natural origin.

  b) the creation of an Advisory Committee with participation of the institutions, independent experts, environmentalist entities and other interested parties, for the follow up of the study and analysis of the achieved results once the study is completed.

  The CSN and the Health Institute "Carlos III" (ISCIII) signed a cooperation agreement on 18th April 2006 for carrying out an epidemiological study investigating the possible effects of the exposure to the radiations derived from the Spanish nuclear and radioactive facilities of the nuclear fuel cycle on the health of the population living in their vicinity. The deadline to complete the study is the end of February 2009.

  The study, currently under way, incorporates an assessment of the exposure derived from the routine operation of the facility from the beginning of their operation up to 2003, making an effort to reconstruct the dose exposure history through the monitoring of the radioactive effluents and the environmental radiological surveillance in the areas close to the facilities. The exposures due to natural radiation in these areas and in two areas of peninsular Spain, of high and low background radiation, are also taken into consideration.

A series of significant actions have been developed with the aim of improving the general response capability to nuclear emergencies in Spain. The most significant ones are the following:

- Implementation of the Nuclear Emergency Basic Plan after being approved.
- Response and preparedness of the CSN
  - Approval and application of the new Action Plan on Emergencies of the CSN, including the Emergency Response Organisation.
  - Execution of the Emergency Room updating plan, consisting in the modification and enlargement of the rooms and the technological update of the computer and telecommunication systems.

On the other hand, the Basic Directive for Civil Protection Planning against Radiological Risks, the elaboration status of which was indicated in the third Report on the Convention, has finally been restricted to radiological emergencies derived from activities or facilities other than nuclear power plants and therefore is of no application to the Convention on Nuclear Safety.

In relation to the pilot application of the waste Management Plan of the José Cabrera plant and Management Plans in all NPPs:

On 23rd June 2006, the Cabinet of Ministers approved the 6th General Radioactive Waste Plan, which describes the current and future generation of radioactive waste in Spain, the technical approaches and the economic and financial aspects of waste management, and constitutes the reference framework for the strategies to be implemented by ENRESA, the public company entrusted with the management of radioactive wastes.

In 2005, the pilot application of the document prepared on the waste management plan for the Jose Cabrera nuclear power plant was finished. The conclusions and lessons learnt were useful to improve the document and to facilitate its subsequent implementation on the other nuclear power plants through the elaboration of a Safety Guide of the Nuclear Safety Council.

On one side, it can be said that the so-called *second line of defence* has been implemented, in practically all Spanish nuclear power plants, for the control of residual materials, consisting of the infrastructures and processes of radiological control required to strengthen the guarantees associated to avoiding any radioactive waste being managed in a conventional way.

On the other hand, improvements have been achieved in the systematic and in the analysis of the information relating to radioactive waste management, with the aim of revealing more precisely the wastes that do not have their management route defined or for which it is possible to improve their current management.

Existing predictions indicate that upon publication of the guide on radioactive waste management plans, which is now in the phase of public comments, all Spanish Nuclear facilities will elaborate new plans in such a way that the definitive implementation is likely to be complete in 2008.

Finally, certain objectives of special interest for the future are underlined:

- Implementation of the recommendations and improvements obtained as a result of the IRRS mission in 2008 and dissemination of the good practices found during the development thereof.
- Continuation of the safety improvement programmes, fundamentally in relation to human resources and strengthening of nuclear facility inspection activities.
- Implementation of the new Emergency Response Plan of the CSN.
- Implementation of the new Basic Nuclear Emergency Plan.
- Completion, in the year 2009, of the epidemiological study on the possible effects of the exposure to radiations derived from the operation of the Spanish nuclear and radioactive facilities of the nuclear fuel cycle on the health of the population living in their vicinity.
- Implementation of the integrated plant supervision system in Spain (SISC) and development of the plan for communicating the achieved result to the public.

As a final conclusion, the nuclear facilities may be said to have operated correctly from the point of view of safety, as indicated in the annual reports submitted to the Spanish Parliament by the CSN during the period covered by this report.

Of the licensees

In this section, the initiatives and activities developed as a consequence of the commitments adopted at the third review meeting of the Convention on Nuclear Safety are summarized.

In relation to the UNESA commitment to report on the maintenance of the technical capability of the licensees:

During the period covered by this Report, the efficiency of the organization performance has been maintained as one of the operating standards, taking into account the human resources.

In accordance with document "Studies on the minimum technical capabilities and staffing of the organization" all Spanish nuclear power plants have maintained the directives thereof referring to the requirements of the minimum technical capabilities and staffing of the departments of each organization to ensure: first, that the operation is carried out in a safe and reliable manner; and second, that each organization is capable of maintaining the explicit and tacit knowledge required to maintain its performance within the achieved efficiency parameters. This has been particularly important and has supposed great efforts in Organisations that have experienced important changes due either to the cessation of the operations or to the inevitable generational changes.

These change processes have been faced up and assumed first by the Management of the organizations who have promoted the design of training processes and of overlapping periods adequate to each specific situation.

Following the CSN's decision to require training simulators for the operating personnel to all nuclear power plants, these facilities have made important efforts to adapt themselves to the new framework. Nowadays, all Spanish nuclear power plants have full scope simulators that are been used or have been used, as it is the case of the José Cabrera nuclear power plant until its final cessation of operations on April 2006, for the initial training of the new licensed personnel and for the on-going training of the licensed personnel. These simulators are used occasionally as support to plant operation on issues such as validation of the operating procedures, analysis of certain incidents, training before performing certain tests or manoeuvres, validation of design modifications and training of the operators prior to their implementation in the Control Room. The simulators are also being used as a complement to the initial and on-going training of the Management personnel, CSN personnel, simulator instructors, engineering personnel and maintenance personnel.

The most significant activities carried out by the licensees of the Spanish nuclear power plants in relation to nuclear safety and radiation protection since the last national report are indicated below:

- In the period covered by this report, the permanent cessation of operations of the José Cabrera Nuclear Power Plant has taken place, on 30th April 2006, after the expiration of the validity of its Operating Permit. Trillo Nuclear Power Plant has renewed its Operating Permit. Santa María de Garoña Nuclear Power Plant has submitted the request for renewal of its Operating Permit that, for the first time in Spain, includes the analyses required for long term operation (beyond 40 years). It may be said that, once completed by all plants the first cycle of Periodic Safety Reviews (PSR), associated to the renewal of their Operating Permits, the new cycle PSRs shall have to include an analysis of the Conditional Application Regulations.
- The cooperation with the CSN has continued with normality in several issues, through joint groups CSN-UNESA, standing out specifically, in this period, the activities relating to integrated management, development and implementation of the Integrated Plant Supervision System (SISC) and corrective actions programme; improvement of the regulatory process efficiency (relating to, for example, the review of new regulations and management of regulatory commitments); organization and human factors, emergencies (revision of the Internal Emergency Plans of the nuclear power plants in accordance

with new Nuclear Emergency Basic Plan approved by the Government and updating of the Emergency Communication System between the plants and the Emergency Room of the CSN); development of the regulations standardisation process promoted by WENRA; and on-going research and development projects, among other.

- Implementation by each Plant, following the document developed by UNESA for that purpose, of the Integrated Management System including safety management and planning of safety related investments.
- Adaptation of the Spanish nuclear power plants processes to the new Integrated Pant Supervision System (SISC). Such adaptation has been necessary to facilitate CSN monitoring and control through the systematic provision of information for the new performance indicators of the plants and for preparation of the inspections to achieve maximum efficiency.
- Implementation by each Plant, in accordance with two documents elaborated by UNESA for that purpose, of the Self-assessment and Corrective Actions Programmes, both tools in trial period, which are revealing themselves as very useful in maintaining plant safety.
- On Probabilistic Safety Analysis (PSA) matters, the application of the Integrated Programme has continued: thus, the Spanish nuclear power plants have kept their PSAs updated; have elaborated PSAs in other modes and with other sources; and have continued applying the PSA for supporting the licensing processes and improving safety, among which the use of PSAs in the SISC framework must be underlined, because it is innovative, both for the determination of the importance of the findings and for obtaining certain parameters included in the calculation method of the indicator of the Mitigation System Performance Indicator.
- The Plants have completed the revision of their design basis and licensing documents, leading to updated Safety Analysis Reports.
- In the Maintenance area and, more specifically, in that of In-service Inspection, the effort devoted to the development and implementation of a methodology for validation of in-service inspection systems for components of the Spanish nuclear power plants must be underlined. This methodology, shown in a UNESA document, has received a generic favourable appreciation from the CSN and it is being developed in detail through to UNESA working groups (GRUVAL and GROIV) and applied to specific components and procedures, some of which have been used already.
- In the Severe Accident area, it is possible to state that the implementation of the Severe Accident Program in all Spanish nuclear power plants is practically complete.
- The activities associated to the ageing control of structures, systems and components has continued; ageing is monitored through the Life Management Plan that each Plant submits annually to the Ministry of Industry, Tourism and Trade. Additionally, all plants have carried out, at the request of the CSN, a specific assessment as consequence of the Vandellós II incident in the essential service water system.
- The IAEA's OSART missions and WANO *Peer Reviews* have continued taking turns at the Spanish nuclear power plants.
- Safety Assessment and Improvement Programmes have received a boost in the Organizational and Human Factors areas and in the specific training on associated fields, among which a special attention has been devoted to the Safety Culture improvement through the implementation of a Safety Culture Programme at each Plant, according to the document developed by UNESA for that purpose, including the independent internal and external assessments contemplated in the document.

- In relation to maintaining the technical capabilities of the licensees, UNESA accepted in the last review meeting to include information on this subject in the next report. The information, detailed in Article 11, says that the Spanish nuclear power plants have applied the document "Studies on the technical capabilities and minimum staffing levels of the organization" in relation to the requirements on technical entailed particularly important efforts in organizations that have experienced significant changes either by cessation of operations of the plant or due to generational changes.

  The activities performed in relation to aspects such as the awareness and commitment of the organisations regarding compliance with ALARA objectives, reduction of the source term and improvement of refuelling activities management and planning have made possible that collective dose per reactor/year in Spain has followed a downward trend, being the Spanish plants in a good position worldwide.

  The radioactive effluents from the nuclear facilities have also followed a downward trend, thanks to improvements to the waste treatment systems and to the efforts to reduce the source term, being now at a level comparable to those of similar plants in other Countries. Moreover, work is being performed since 2006 to adapt the EU's recommendation on effluents.

- The adaptation to the new Spanish regulations on radiation protection, themselves an adaptation of European directives, is being accomplished without problems due to the measures adopted to reduce individual doses through the improvement of processes and the automation of tasks implying the highest radiological risk. Additionally, improvements have been made to the dosimetric systems, especially in the internal dosimetry area.

- The development of different projects intended to minimizing the low and intermediate activity wastes and a better management thereof has continued (declassification projects, waste management plans, implementation of new equipment and systems at the plants…). The installation of archways for detecting possible radioactive materials in vehicles leaving the site is being completed at all plants.

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