

# Spanish Nuclear Safety Council report to the Parliament

Year 2010 Summary

CSN



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## Summary

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## Introduction

In 2010, the Spanish Nuclear Safety Council (in Spanish, CSN) celebrated its thirtieth anniversary. During its thirty-year existence, the CSN has fulfilled its mission as an independent regulatory body, obtaining both local and international recognition and prestige.

The Council of Ministers of 5 November 2010 approved the CSN's new Statute, which establishes the powers of this regulatory body, its organisational structure, staff regime, contracting regime and legal assistance, as well as the patrimonial, budgetary, economic-financial management control and accounting schemes.

The Statute was reformed pursuant to the modification of Law 15/1980 on the Creation of the CSN, published at the end of 2007, which sets forth, among others, the legal framework to strengthen and guarantee the effective independence of said body, by taking into account the increasing social awareness of the environment, and by institutionalising the necessary mechanisms in order to promote and enhance transparency and social participation, and to reinforce the public's right to access information. Particularly, the approval of the Statute has enabled the creation of the Advisory Information and Public Participation Committee in relation to nuclear safety and radiological protection, whose functions, established by law, consist of its ability to issue recommendations to the CSN with the aim of guaranteeing and improving transparency, and proposing any necessary measures to promote the access to information and the participation of the members of the public in CSN matters.

This committee has wide institutional representation, since it is composed of public administrations as well as social, industry and environmental organisations, and qualified experts. By the end of 2010, the necessary arrangements were started for the appointment of representatives and for the Advisory Committee organisational meeting, which was held at the end of February 2011.

The adaptation of the CSN organic structure to the new Statute was completed at the end of that year.

The renewal cycle of authorisation licenses for Spanish nuclear power plants started in 2009. After renewing the operating license for Santa María de Garoña nuclear power plant in 2009, the CSN reported favourably, in 2010, the 10-year license renewal for the two Almaraz units and Vandellós II nuclear power plant. In addition, technical studies have begun this year toward the renewal of operating permits for Cofrentes power plant and for the two Ascó units, whose licenses will expire in 2011. Moreover, it is worth highlighting the Council's favourable report regarding a power uprate of 8% at Almaraz II nuclear power plant, as well as the CSN's positive assessment with regard to similar power uprate tests conducted at Almaraz I nuclear power plant.

The CSN uses an Integrated Plant Supervision System (in Spanish, SISC) as a basic tool to assess power plant operation as far as safety is concerned. During 2010, new aspects relating to physical protection and to the safety culture were added to the SISC, and their pilot phase implementation is expected to start in 2011.

It can be stated, that according to the results of the regulatory activity, the Spanish nuclear power plants performed adequately in 2010. During this period, the Spanish nuclear fleet, as a whole, was in the SISC's status of *plant response* 75% of the time, which means that the plants were operating under normal conditions. Only the Ascó I, Ascó II and Cofrentes power plants required additional regulatory intervention to that originally planned according to the system, as a result of some deficiencies found through the operation indicators or in the inspections made pursuant to the SISC.

In 2010, the Spanish nuclear power plants reported 66 events pursuant to CSN Instruction IS-10. 98% of those events were caused by operational deviations which had no impact on safety, in accordance with the IAEA's International Nuclear Events Scale (INES Scale). Only one event was categorised as a level 1 *anomaly* on the aforementioned scale, due to non-compliance with a surveillance requirement of the reserve control liquid system at the Cofrentes nuclear plant.

With respect to the plans for improving nuclear power plant safety management, the Action Plan for Safety Management Improvement (in Spanish, PAMGS) at Vandellós II power plant was finished in 2010. This action plan was created in 2004 as a result of the degradation of the essential services cooling water system. During this period, the plant implemented all the required improvement measures, both the design modifications that separated the plant's final heat sink from the seawater, and the organisational and management measures. Some of those improvement measures have been added to the Plan for the Organisational, Cultural and Technical Reinforcement (in Spanish, Procura) in order to bring together the improvement measures of the Ascó-Vandellós Nuclear Association in a single corporate plan.

As far as Radiological Protection is concerned, the Epidemiological Study started in 2006 by the Carlos III Health Institute, in collaboration with the CSN, was completed in 2010. This study, which reviews research done on the possible health effects of ionising radiations on populations residing in areas surrounding nuclear facilities, was submitted to Parliament by the Ministry of Health, Social Policy and Equality in April 2010. The study concluded that there are no harmful health effects on populations residing in areas surrounding nuclear facilities in the country.

The radiation levels, both in the vicinity of nuclear facilities and in the country as a whole, have remained normal, in line with the measures adopted by the existing environmental radiological surveillance networks.

The ionising radiation doses received by professionally exposed workers continue to be at very low individual average values. In 2010, a total 103,934 exposed workers were dosimetrically controlled, showing an individual average dose of 0.72 miliSieverts/year, in comparison with the established limit of 20 miliSieverts/year. These data are stored at the CSN's National Dosimetry Bank, which centralises all the dosimetry histories of exposed workers since 1985.

With regard to emergency preparedness, the CSN, together with the Ministries of the Interior; Economy and Treasury; Industry, Tourism and Trade; and the Spanish Radioactive Waste Management Agency (Enresa), has signed the *Action Protocol in the event of inadvertent movement or illegal trading of radioactive material in general interest ports*, within the framework of the Megaports initiative. In addition, it has also signed a collaboration agreement with the Military Emergency Response Unit (UME) of the Ministry of Defence, in relation to the planning, preparedness and response in the event of nuclear and radiological emergencies. This agreement sets out several collaboration activities, including the design and the project for the installation of an emergency room to provide support to the CSN's Emergency Room (Salem), at the UME head office located in Torrejón de Ardoz (Madrid). All nuclear facilities have conducted the mandatory internal emergency drills in 2010.

The CSN has continued its intense regulatory activity as far as license issuing and control are concerned. In 2010, the CSN has issued a total of 432 expert reports: 48 for power plant licenses; 12 for nuclear fuel cycle facilities, storage and research centres; 3 for facilities in the dismantling and decommissioning phase; 365 for radioactive facilities, and 4 for the transportation of nuclear and radioactive material. It has also issued other reports for the validation of approval certificates for transport packages and for models of radioactive devices. It has further granted 5,052 new licences for the operating personnel of nuclear and radioactive facilities. In addition, this year the CSN has approved two temporary exemptions to the operating technical specifications of nuclear power plants.

With regard to its inspection activity during 2010, the CSN has conducted 2,103 inspections: 167 at power plants; 39 at nuclear fuel cycle facilities, storage facilities and research centres; 26 at facilities in the dismantling and decommissioning phase; 1,815 at radioactive facilities in the fields of industry, research and medicine; and 56 in relation to the transportation of nuclear and radioactive material.

Making use of its coercive powers, the CSN has proposed the opening of eight disciplinary files against nuclear and radioactive facilities, as well as utility companies, all of them for minor infringements, with the exception of two cases at industrial radioactive facilities. It has also issued 106 warnings for the correction of deficiencies found in regulated facilities and activities.

As far as legal provisions are concerned, there have been major changes in relation to the Council's scope of authority. In 2010, in addition to the approval of the new Statute mentioned above, the Regulation on Health Protection against Ionising Radiations was reformed pursuant to Royal Decree 1439/2010 of November 5, and the Basic Standard for the Planning of Civil Defence in the event of Radiological Risk was approved by virtue of Royal Decree 1564/2010 of November 19. Said standard seeks to reinforce the planning of protective measures and the information to the population in the event of radiological emergencies. Moreover, it is worth mentioning that the CSN collaborated with the Ministry of Industry, Tourism and Trade and with the Ministry of the Interior and other national authorities in the elaboration of the Royal Decree on the Physical Protection of Nuclear Facilities, Nuclear Material and Transportation of Nuclear and Radioactive Material, which establishes the necessary foundations for the definition of the design baseline threat.

In 2010, the CSN approved six new instructions in relation to: the filing and withholding period of documents and records of nuclear facilities; the criteria followed for conducting probabilistic safety analyses and for their application to nuclear power plants; basic safety requirements and basic design criteria applicable to nuclear facilities; operating technical specifications to be complied with by second and third category radioactive facilities; and safety criteria in facilities temporarily storing spent fuel assemblies and high level waste. It further approved and published a safety guide in relation to the quality standards to be maintained by radon measurement services and laboratories.

8 In 2010, the CSN signed a collaboration framework agreement with the Ministry of Health, Social Policy and Equality.

The CSN has continued to develop Law 11/2007 of June 22 of Electronic Access to Public Services by the Public, using its new corporate website created in 2009, pursuant to Law 33/2007 of November 7. During the first months of 2010, the CSN incorporated the virtual office, the electronic signature and the electronic registration system in its website.

In line with these institutional improvement activities, the CSN has continued to apply the model of competence-based management in relation to the qualifications of the organisation's personnel. It has also made progress in the areas for improvement identified by the IAEA's Integrated Regulatory Review Services (IRRS) Mission, which took place in 2008 and whose follow-up mission was conducted at the beginning of 2011. Within the frame of these improvements, the CSN has continued the internal audit plan started in 2009 by conducting nine audits on the CSN's operational processes.

As regards international relations, it is worth mentioning that the CSN collaborated to provide support during the Spanish European Union presidency, and worked on a draft

on the future European Directive aimed at establishing a framework which ensures safe and responsible management of spent fuel assemblies and radioactive waste.

Finally, since the 2005-2010 Strategic Plan expired in 2010, action has been taken towards the drawing up of a new plan for 2011-2016, which will be approved in 2011.



## 1. The Nuclear Safety Council

No modifications were made to the Board Commissioners hierarchical structure in 2010, which has remained as follows:

- President: Carmen Martínez Ten.
- Vice-president: Luis Gámir Casares.
- Commissioner: Francisco Fernández Moreno.
- Commissioner: Antonio Colino Martínez.
- Commissioner: Antoni Gurguí Ferrer.

In 2010, the CSN celebrated its thirtieth anniversary. For that reason, a commemorative full-day ceremony was held at the Senate on June 28 to honour former members of the Plenary, composed of the Body's ex presidents. Among the attendees were Yukiya Amano, general director of the International Atomic Energy Agency, Joaquín Almunia, European Commission vice-president, and Miguel Sebastián, Minister of Industry, Tourism and Trade.

On the occasion of said anniversary, His Majesty the King Juan Carlos I granted an audience to the CSN Plenary on July 1, 2010.

In 2010, the CSN's basic reference legal framework was made up of: Law 33/2007 of November 7, passed to reform Law 15/1980 of April 22 on the Creation of the CSN; the regulatory provisions set forth in Royal Decree 1157/1982 of April 30, whereby the CSN Statute was approved; and recently, Royal Decree 1440/2010 approved by the Council of Ministers on 5 November 2010, which approved the CSN's new Statute.

Throughout its five titles, the new Statute establishes the powers of this regulatory body, its organisational structure, staff regime, contracting

regime and legal assistance, as well as the patrimonial, budgetary, economic-financial management control and accounting schemes. It further contains provisions related to the operation of the Advisory Information and Public Participation Committee created by virtue of Law 33/2007.

In 2010, there were some important developments regarding the regulation of the Council's activities. Among them, and in addition to the new Statute, we must mention Royal Decree 1439/2010 of November 5, which reformed the Regulation on the Protection of Health against Ionising Radiations, approved by Royal Decree 783/2001 of July 6, and Royal Decree 1564/2010 of November 19, approving the Basic Standard for the Planning of Civil Defence in the Event of Radiological Risk.

This same year, the CSN held 37 Plenary ordinary sessions. The Council's decisions continued to be taken by unanimous consent and only one decision by the Council resulted in one dissenting vote.

The Council Plenary adopted a total of 394 resolutions in 2010, 30 of which are undertakings on the part of the Body's work entities, the Secretariat-General or the Council members themselves. 25 of these resolutions were acted upon this year, while others will be closed in future years on account of their nature.

Annex I contains the main resolutions adopted by the Plenary of the CSN in 2010.

The Council has been informed about the adoption, in 2010, of a total of 609 decisions, pursuant to task delegations made to other CSN bodies. In the course of this year, the Council delegated certain functions to technical directors in relation to the safety of activities and facilities within the nuclear and radioactive environment (the power to issue technical instructions).

Taking into account both the Plenary resolutions and the decisions taken by way of delegation, in 2010 the CSN adopted a total 1,003 decisions or resolutions, a similar number to that registered the previous year.

Throughout 2010, the Council continued to promote and develop its policy of operation transparency enhancement, and of improvement on the information of and participation in the Body's activities. The most remarkable development was that, once the new CSN Statute was approved, steps were taken for the prompt creation of the Advisory Information and Public Participation Committee and the appointment of its members.

The Council committees continued, under the supervision of the Council members, to promote the activities entrusted to the Body in the areas of strategic planning, regulations, external relationships, resources and media, as well as training and R&D. The main issues discussed by these committees include:

- Preparations for the IRRS follow-up mission.
- Action plan pursuant to the IRRS recommendations.
- Law to Reform Nuclear Energy Law 25/1964.
- CSN's 30<sup>th</sup> anniversary.
- Follow-up of the CSN's virtual office operation.
- Analysis and debate of courses of action in R&D in view of the budget restrictions.
- Follow-up of the progress made in the implementation of the competence-based management model.
- Budget use follow-up.

In addition to the Council's committees, the Nuclear Safety and Radiological Protection Committee, operating under the supervision of the Council's Secretariat-General, is in charge of informing the Council members of potential issues to be submitted to the Plenary by the technical offices in the short term, as well as acting as an open debate forum in relation to proposals and matters of general interest or technical complexity.

The main topics discussed by this Committee in 2010 include:

- Matters related to the dosimetry of workers exposed to ionising radiations.
- Transportation of radioactive material.
- Proposal of operating license renewal requirements for Almaraz nuclear power plant in 2010.
- Compliance status of the complementary technical instructions and conditions imposed on Santa María de Garoña NPP pursuant to the operating license renewal granted in 2009.
- Revision 1 of the Ciemat Site Restoration Plan.
- Status of the actions required in the operating license renewal of Almaraz NPP and of the plans for refuelling operations of unit II.

With regard to the Council members' participation in the Body's coordination activities, we must mention the following activities for 2010:

- Coordination of the activities related to the organisation of the CSN's thirtieth anniversary, celebrated in June 2010.
- Supervision of the preparatory activities for the 2011-2016 Strategic Plan.

- Coordination of preliminary activities of the IAEA's IRRS follow-up mission.
- Coordination of activities related to the Design Basis Threat at nuclear and radioactive facilities.
- Supervision of working groups on the modernisation and improvement of radiological surveillance automatic station networks.

Regarding its information duties to the Parliament, the Council fulfilled its obligations in a timely manner, answered to written questions from both the Congress and the Senate and acted upon resolutions adopted by the Congress's Industry, Trade and Tourism Committee.

The Council's 2009 Annual Report to the Congress and the Senate was submitted to both houses on 30 June 2010, pursuant to Law 15/1980, section 11, according to the provisions set forth in Law 33/2007. In addition, the report was submitted to the parliaments of those autonomous communities where there are nuclear facilities, as well as to the parliaments of

autonomous communities with which the CSN has agreements for the assignment of responsibilities.

In 2010, the president of the CSN appeared before the Congress on the following occasions:

- Before the Sub-committee on the Spanish Energy Strategy Analysis for the next 25 years, a committee within the Congress, in order to inform about the current situation of nuclear energy and prospects for the future. This appearance was on 11 May 2010.
- Before the Congress's Industry, Tourism and Trade Committee, in order to submit the Report on the CSN's activities during 2009. This appearance was on 1 December 2010.

In its session held on 15 December 2010, the Congress's Industry, Tourism and Trade Committee approved 38 resolutions in relation to the Report on the Activities carried out by the CSN during 2009, of which 30 were expressly addressed to the CSN and 8 to the Government.

## 2. Supervision and control of installations and activities

### 2.1. Nuclear power plants

#### 2.1.1. Operation

Six nuclear power plants (eight reactors) shown in table 1 were in operation in 2010.

The global assessment of nuclear power plant operation is primarily based upon the results of the Integrated Plant Supervision System (SISC); any reported events, particularly those in a category above level zero on the INES Scale; radiological impact; workers dosimetry; any relevant

modifications required; warnings and disciplinary actions; and the impact of such operation.

#### Integrated Plant Supervision System (SISC)

The SISC is currently an essential tool in assessing power plant operation with regard to safety, planning of the CSN's supervision and control efforts and communication to the public of those two matters.

In 2010, the Spanish nuclear fleet, as a whole, operated normally 75% of the time. Standard programmes for the inspection and correction of deficiencies were applied. This status is referred to as *plant response* in the SISC's diagnosis table. The remaining 25% of the time, the CSN was required to pay special regulatory attention within the framework established by the system.

**Table 1. General information on the nuclear power plants and their operation in 2010**

|                                        | Almaraz I                  | Almaraz II                 | Ascó I                                                   | Ascó II                    | Vandellós II | Trillo                     | Garoña                                   | Cofrentes                           |
|----------------------------------------|----------------------------|----------------------------|----------------------------------------------------------|----------------------------|--------------|----------------------------|------------------------------------------|-------------------------------------|
| Type                                   | PWR                        | PWR                        | PWR                                                      | PWR                        | PWR          | PWR                        | BWR                                      | BWR                                 |
| Gross capacity (MW)                    | 2,947                      | 2,729                      | 2,950.6                                                  | 2,950.6                    | 2,940.6      | 3,010                      | 1,381                                    | 3,237                               |
| Net capacity (MW)                      | 1,045                      | 984                        | 1,032                                                    | 1,028                      | 1,087.1      | 1,066                      | 465,6                                    | 1,104                               |
| Start-up authorisation date            | 13-10-80                   | 15-06-83                   | 22-07-82                                                 | 22-04-85                   | 17-08-87     | 04-12-87                   | 30-10-70                                 | 23-07-84                            |
| Current authorisation date             | 07-06-10                   | 07-06-10                   | 02-10-01                                                 | 02-10-01                   | 21-07-10     | 16-11-04                   | 03-07-09                                 | 19-03-01                            |
| Term of validity (years)               | 10                         | 10                         | 10                                                       | 10                         | 10           | 10                         | Through 06-07-13                         | 10                                  |
| Refuelling outage                      | 02-11-09<br>to<br>16-01-10 | 21-11-10<br>to<br>25-01-11 | No                                                       | 08-05-10<br>to<br>26-06-10 | No           | 15-04-10<br>to<br>16-05-10 | Partial <sup>(2)</sup><br>to<br>14-05-10 | No                                  |
| Operation factor %                     | 93.00                      | 86.43                      | 93.96                                                    | 86.59                      | 94.67        | 90.98                      | 95.17                                    | 100                                 |
| Load factor %                          | 89.48                      | 84.63                      | 92.41                                                    | 84.92                      | 93.04        | 88.13                      | 93.99                                    | 99.82                               |
| Indicators<br>SISC > green             | –                          | –                          | 2 white<br>(during 2 and 4<br>quarters,<br>respectively) |                            | –            | –                          | –                                        | 1 white<br>(during<br>3<br>quarter) |
| Findings<br>SISC > green               | –                          | –                          | –                                                        | –                          | –            | –                          | –                                        | –                                   |
| Event level<br>INES > 0 <sup>(1)</sup> | –                          | –                          | –                                                        | –                          | –            | –                          | –                                        | 1 level 1                           |

(1) Events notified by the nuclear power plants that have been classified by the CSN in accordance with the INES scale over level 0.

(2) Outage scheduled from May 2<sup>nd</sup> to May 14<sup>th</sup> for the partial refuelling and maintenance work, in order to adapt to the foreseen operation interruption date.

The CSN web contains a specific link to the SISC ([www.csn.es/sisc/index.do](http://www.csn.es/sisc/index.do)), which includes, for all nuclear power plants, and on a quarterly basis, the system's results and the supporting operational information, as well descriptive documentation and relevant procedures.

During 2010, no inspection findings were above the *green* category and the indicators described below were above such classification:

- A *white* indicator at Cofrentes NPP, in the emergency preparedness pillar, since the operation indicator of "Response in the event of emergency situations and drills" were active for the last three quarters of the year.
- A *white* indicator at Ascó I NPP, in the initiating event pillar, due to the number of non-scheduled scrams. This indicator was active for the first two quarters of the year.
- A *white* indicator at Ascó I NPP, in the mitigation systems pillar, due to the failure rate

in mitigation systems related to the emergency diesel generators. This indicator was active for the four quarters of the year.

The aforementioned results and the aggregate number of 2009 findings and indicators the SISC takes into account make up, in the four quarters of 2010 and for all power plants, the diagnosis table shown in table 2.

Figure 1 summarises the SISC's results for the 2007-2010 period, and it includes information for each of the existing reactors in operation.

According to the SISC's results for 2010, the Spanish nuclear fleet operated correctly as far as safety is concerned.

#### Reportable events

The nuclear power plant directors reported a total of 66 events in 2010, one of which was categorised as a level 1 event on the International Nuclear Events Scale (INES) and the rest were categorised as level 0, below the scale.

**Table 2. Summary of the SISC's diagnosis table in 2010**

|              | Quarter I           | Quarter II          | Quarter III         | Quarter IV          |
|--------------|---------------------|---------------------|---------------------|---------------------|
| Almaraz I    | –                   | –                   | –                   | –                   |
| Almaraz II   | –                   | –                   | –                   | –                   |
| Ascó I       | Regulatory response | Regulatory response | Regulatory response | Regulatory response |
| Ascó II      | Regulatory response | –                   | –                   | –                   |
| Vandellós II | –                   | –                   | –                   | –                   |
| Trillo       | –                   | –                   | –                   | –                   |
| Garofña      | –                   | –                   | –                   | –                   |
| Cofrentes    | –                   | Regulatory response | Regulatory response | Regulatory response |

(–) Plant response.

Figure 1. SICS's results 2007-2010

| Almaraz I nuclear power plant |      |    |    |    |      |    |    |    |      |    |    |    |      |    |    |    |
|-------------------------------|------|----|----|----|------|----|----|----|------|----|----|----|------|----|----|----|
|                               | 2007 |    |    |    | 2008 |    |    |    | 2009 |    |    |    | 2010 |    |    |    |
| MD                            |      |    |    |    |      |    |    |    |      |    |    |    |      |    |    |    |
| PD                            |      |    |    |    |      |    |    |    |      |    |    |    |      |    |    |    |
| RR                            |      |    |    |    |      |    |    |    |      |    |    |    |      |    |    |    |
| RT                            |      |    |    |    |      |    |    |    |      |    |    |    |      |    |    |    |
|                               | T1   | T2 | T3 | T4 | T1   | T2 | T3 | T4 | T1   | T2 | T3 | T4 | T1   | T2 | T3 | T4 |

| Almaraz II nuclear power plant |      |    |    |    |      |    |    |    |      |    |    |    |      |    |    |    |
|--------------------------------|------|----|----|----|------|----|----|----|------|----|----|----|------|----|----|----|
|                                | 2007 |    |    |    | 2008 |    |    |    | 2009 |    |    |    | 2010 |    |    |    |
| MD                             |      |    |    |    |      |    |    |    |      |    |    |    |      |    |    |    |
| PD                             |      |    |    |    |      |    |    |    |      |    |    |    |      |    |    |    |
| RR                             |      |    |    |    |      |    |    |    |      |    |    |    |      |    |    |    |
| RT                             |      |    |    |    |      |    |    |    |      |    |    |    |      |    |    |    |
|                                | T1   | T2 | T3 | T4 | T1   | T2 | T3 | T4 | T1   | T2 | T3 | T4 | T1   | T2 | T3 | T4 |

| Cofrentes nuclear power plant |      |    |    |    |      |    |    |    |      |    |    |    |      |    |    |    |
|-------------------------------|------|----|----|----|------|----|----|----|------|----|----|----|------|----|----|----|
|                               | 2007 |    |    |    | 2008 |    |    |    | 2009 |    |    |    | 2010 |    |    |    |
| MD                            |      |    |    |    |      |    |    |    |      |    |    |    |      |    |    |    |
| DP                            |      |    |    |    |      |    |    |    |      |    |    |    |      |    |    |    |
| RR                            |      |    |    |    |      |    |    |    |      |    |    |    |      |    |    |    |
| RT                            |      |    |    |    |      |    |    |    |      |    |    |    |      |    |    |    |
|                               | T1   | T2 | T3 | T4 | T1   | T2 | T3 | T4 | T1   | T2 | T3 | T4 | T1   | T2 | T3 | T4 |

| Ascó I nuclear power plant |      |    |    |    |      |    |    |    |      |    |    |    |      |    |    |    |
|----------------------------|------|----|----|----|------|----|----|----|------|----|----|----|------|----|----|----|
|                            | 2007 |    |    |    | 2008 |    |    |    | 2009 |    |    |    | 2010 |    |    |    |
| MD                         |      |    |    |    |      |    |    |    |      |    |    |    |      |    |    |    |
| DP                         |      |    |    |    |      |    |    |    |      |    |    |    |      |    |    |    |
| RR                         |      |    |    |    |      |    |    |    |      |    |    |    |      |    |    |    |
| RT                         |      |    |    |    |      |    |    |    |      |    |    |    |      |    |    |    |
|                            | T1   | T2 | T3 | T4 | T1   | T2 | T3 | T4 | T1   | T2 | T3 | T4 | T1   | T2 | T3 | T4 |

| Ascó II nuclear power plant |      |    |    |    |      |    |    |    |      |    |    |    |      |    |    |    |
|-----------------------------|------|----|----|----|------|----|----|----|------|----|----|----|------|----|----|----|
|                             | 2007 |    |    |    | 2008 |    |    |    | 2009 |    |    |    | 2010 |    |    |    |
| MD                          |      |    |    |    |      |    |    |    |      |    |    |    |      |    |    |    |
| DP                          |      |    |    |    |      |    |    |    |      |    |    |    |      |    |    |    |
| RR                          |      |    |    |    |      |    |    |    |      |    |    |    |      |    |    |    |
| RT                          |      |    |    |    |      |    |    |    |      |    |    |    |      |    |    |    |
|                             | T1   | T2 | T3 | T4 | T1   | T2 | T3 | T4 | T1   | T2 | T3 | T4 | T1   | T2 | T3 | T4 |

| Vandellós II nuclear power plant |      |    |    |    |      |    |    |    |      |    |    |    |      |    |    |    |
|----------------------------------|------|----|----|----|------|----|----|----|------|----|----|----|------|----|----|----|
|                                  | 2007 |    |    |    | 2008 |    |    |    | 2009 |    |    |    | 2010 |    |    |    |
| MD                               |      |    |    |    |      |    |    |    |      |    |    |    |      |    |    |    |
| DP                               |      |    |    |    |      |    |    |    |      |    |    |    |      |    |    |    |
| RR                               |      |    |    |    |      |    |    |    |      |    |    |    |      |    |    |    |
| RT                               |      |    |    |    |      |    |    |    |      |    |    |    |      |    |    |    |
|                                  | T1   | T2 | T3 | T4 | T1   | T2 | T3 | T4 | T1   | T2 | T3 | T4 | T1   | T2 | T3 | T4 |

| Trillo nuclear power plant |      |    |    |    |      |    |    |    |      |    |    |    |      |    |    |    |
|----------------------------|------|----|----|----|------|----|----|----|------|----|----|----|------|----|----|----|
|                            | 2007 |    |    |    | 2008 |    |    |    | 2009 |    |    |    | 2010 |    |    |    |
| MD                         |      |    |    |    |      |    |    |    |      |    |    |    |      |    |    |    |
| DP                         |      |    |    |    |      |    |    |    |      |    |    |    |      |    |    |    |
| RR                         |      |    |    |    |      |    |    |    |      |    |    |    |      |    |    |    |
| RT                         |      |    |    |    |      |    |    |    |      |    |    |    |      |    |    |    |
|                            | T1   | T2 | T3 | T4 | T1   | T2 | T3 | T4 | T1   | T2 | T3 | T4 | T1   | T2 | T3 | T4 |

Situation of the diagnosis table: RT: plant response. RR: regulatory response. DP: degraded pillar. MD: multiple degradations.  
T1/2/3/4: quarters 1, 2, 3 or 4.

The aforementioned level 1 event occurred on 12 May 2010 at Cofrentes nuclear power plant and consisted of the failure to comply with a surveillance requirement of the reserve control liquid system related to the volume of the system's borated water storage tank. The lack of compliance was due to an error in the calibration of the tank level measurement, which had 14,396 litres instead of the minimum 15,000 litres required. The power plant proceeded to put the tank back into operation and to document the cause of the error for future measurements.

### Sanctions and disciplinary measures

In 2010, the CSN proposed to the Ministry of Industry, Tourism and Trade the opening of two disciplinary files and issued two warnings:

- A proposal for the opening of a disciplinary file against Cofrentes NPP due to breach of section 3.1.1 of CSN Instruction IS-21, related to applicable requirements for the modification of nuclear power plants.
- A proposal for the opening of a disciplinary file against Vandellós II NPP due to lack of compliance with operation technical specification 3/4.7.12 of protection against fires.
- A warning against Santa María de Garoña NPP due to breach of Instruction IS-12 of the CSN, related to the qualification and training requirements for non-licensed, regular and outsourced personnel within nuclear power plants.
- A warning against Ascó NPP due to lack of compliance with operation technical specification 3/4.7.12 of protection against fires.

### Temporary exemptions

In 2010, the CSN approved two temporary exemptions to the Operating Technical Specifications of nuclear power plants:

- Santa María de Garoña NPP: the CSN granted a 10-day temporary exemption to compliance with the Improved Operating Technical Specification 3.7.10 PCI – Water System for Protection Against Fires, in order to carry out maintenance tasks on the protective coating of water inlets against the “zebra” mussel.
- Trillo NPP: The CSN approved the temporary exemption, from January 20 until refuelling operations begin in April, to the compliance with the Operating Technical Specification related to the operation indicator of the neutron noise limitation system.

### 2.1.2. Licensing

In 2010, the CSN issued 48 expert reports for licenses or favourable assessments. The most relevant matters reported include:

- Almaraz NPP: 10-year renewal of the power plant's operating permit, with the consequent restrictions and conditions as well as complementary technical instructions.
- Vandellós II NPP: 10-year renewal of the power plant's operating permit, with the consequent restrictions and conditions as well as complementary technical instructions.
- Almaraz I NPP: favourable assessment on the trial plan results in relation to the authorised request for an 8% increase in thermal power.
- Almaraz II NPP: Authorisation for the design modification of an 8% power uprate, up to 2,947 MW gross capacity, together with the related modifications of the Safety Study and the Operating Technical Specifications.

- Vandellós II NPP: Authorisation for a design modification to change the infiltration value of the control room shell.
- Ascó I and II NPPs: Authorisation to postpone the submitting of level 1 Probabilistic Safety Analysis reviews of fires during power operation, internal events in other operating modes and flooding during power operation, related to the renewal of the operating permit, due in October 2011.
- Cofrentes NPP: Authorisation for the specific project of waste clearance and renewal of the authorisation for spent fuel clearance. In addition, in relation to both authorisations, there was a favourable assessment towards a new review of the Radioactive Waste and Spent Fuel Management Plan.
- Within the plans for improvement of Ascó-Vandellós Nuclear Association (ANAV), there was a positive assessment of the closing of the Action Plan for Safety Management Improvement (PAMGS), applicable to Vandellós II NPP, and of revision II of the Plan for the Organisational, Cultural and Technical Reinforcement (Procura), applicable to both the Ascó and Vandellós II NPPs.

Among the CSN's licensing activities, we must also mention the important programmes carried out for nearly three years to support the expert reports on the request for renewal of the operating permits at Almaraz (units I and II) and Vandellós II, announced in April and June, respectively.

### 2.1.3. Follow-up and control

The CSN performs follow up and control tasks on nuclear power plants mainly by way of its inspection powers, and it also supervises the

development of various power plant safety improvement programmes.

#### 2.1.3.1. Inspection

167 inspections were conducted at the six power plants in operation (eight units) in 2010.

99 of them were made pursuant to the Basic Inspection Programme (in Spanish, PBI) established in the SISC. In 2010, said Programme included 75 inspections conducted by CSN specialists in different fields and the rest were conducted by resident inspectors and are recorded in 24 record files of quarterly inspections. This means that virtually all the inspections scheduled for 2010 in the PBI were conducted.

The remaining inspections include the supplementary inspections conducted as a result of indicators or findings in SISC inspections which fall under a category above *green*; the reactive inspections conducted as a result of operational incidents; inspections on generic issues, pursuant to new regulations and the CSN's and third parties' operational experience; and other inspections related to licensing.

The assessment of both the periodic safety review and the application of the required regulations required the conduction of licensing inspections both at Almaraz and Vandellós II NPPs, in view of the expert reports authorising the renewal of their respective operating permits.

An inspection was also conducted on the trial programme for the design modification at Almaraz I NPP, aimed at increasing its thermal power. Five of those trials were attended by CSN officers.

#### 2.1.3.2. Safety improvement programmes

The most relevant safety improvement programmes in force in 2010 were:

### Periodic safety review programmes

The periodic safety review assessment in relation to the renewal of the operating permits for Almaraz and Vandellós II, announced in April and June, respectively, was completed in 2010. In addition, the analysis of the periodic safety reviews continued at Cofrentes and Ascó, with the aim to review the request for renewal of their operating permits due in March and October of 2011.

### Generic issues

A generic issue is defined as any safety problem found at any national or foreign nuclear power plant which might affect other power plants. The CSN performs the follow up and promotes the analysis of applicability in Spanish power plants, as well as the adoption of corrective measures derived from such analysis.

The most relevant generic issues throughout 2010 include:

- *Corrosion of anchor bolts in the refuelling water storage tank*

This issue resulted from corrosion found in the anchor bolts of the refuelling water storage tank due to filtration of rain water through the thermal insulation system. In view of the risk of anchor bolts being incapable of resisting the design loads, the CSN, in addition to its control and inspection activities carried out at Ascó, sent a generic letter to all nuclear power plants requiring them to inspect the anchor bolts in all outdoor tanks and structures which are part of the safety systems or whose collapse might affect safety systems, provided they are not currently conducting a periodic verification of that kind.

- *Failure of magnesium rotors in motor-operated valve actuators*

The US-NRC published two *Information Notices* relating to failures of motors with a magnesium

rotor of motor-operated valves, due to high temperatures or humidity, which cause galvanic corrosion, general corrosion or thermal stress. This type of failure was registered in Spanish nuclear power plants on two occasions, both in 2009, although there might have been more cases before the category of the failure was clearly identified.

Notwithstanding the measures taken by power plants in relation to this problem, in 2010 the CSN sent a generic letter to the nuclear power plants requesting, among other issues, a list of all valve actuators having a magnesium rotor and information on review procedures, guides of ownership groups and a spare parts inventory.

- *Disruptions in the safety valve blowdown*

This issue was caused by an incident at Almaraz, which consisted of the unexpected opening of the suction relief valve of the residual heat removal system and its later closing at a lower pressure than specified.

This event, caused by a misinterpretation of the manufacturer's adjustment procedure, resulted in the CSN issuing a technical instruction to all power plants in 2008. After analysing the actions required in this instruction, in 2010 the CSN sent a generic letter to all nuclear power plants, broadening the scope of such instruction to include all safety valves which had previously been excluded, but which are installed in systems that fall under the criteria included in the maintenance regulation.

- *Management of gas accumulation in emergency core cooling systems, residual heat removal systems and containment spray systems*

In 2008, the NRC issued a *Generic Letter* requiring measures to be taken in order to

prevent gas accumulation in the pipes of emergency core cooling systems, residual heat removal systems and containment spray systems, which may affect the proper operation of such systems.

In turn, the CSN sent a technical instruction to all nuclear power plants establishing the same requirements and terms as those set out in the *Generic Letter*. Throughout 2009 and 2010, the power plants took the necessary steps to comply with the aforementioned instruction and the CSN started the corresponding assessments and inspections, which will finish in 2011.

#### **Human and Organisational Factors**

Since 1999, all Spanish nuclear power plants have implemented safety assessment and improvement programmes in relation to organisation and human factors. These programmes seek to implement mechanisms for the supervision of human behaviour and human error prevention tools. They further aim to determine the influence of human factors in design modification and the assimilation of operational experience, define assessment and improvement processes within the culture of safety, and verify improvement plans efficiency.

In 2010, inspections were conducted in connection to said programmes at the Almaraz, Trillo, Ascó and Vandellós II NPPs.

#### **Action Plan for Safety Management Improvement at Vandellós II (PAMGS)**

In March 2010, the licensee sent to the CSN the closure report on the Action Plan for Safety Management Improvement (PAMGS), which received a positive assessment in May. The assessment, which consisted of three specific inspections, also took into account the external assessment on safety culture at Vandellós II in the autumn of 2008 and the results of the OSART

Mission initiated by the IAEA at Vandellós II in September 2009.

The PAMGS included 36 major improvement measures, 19 of which were of an organisational and managerial nature, and 17 were related to physical improvements and modifications in the facilities. The former were implemented and validated, and the latter, the deviations found in the new engineered safeguards cooling system, are being dealt with through a corrective action plan currently in force.

Finally, some improvement measures established in the PAMGS were transferred to the Procura Plan, created by the Ascó-Vandellós Nuclear Association, and which is applicable to both power plants.

#### **ANAV's Procura Plan**

In March 2010, the Council positively assessed revision 2 of the Plan for the Organisational, Cultural and Technical Reinforcement (Procura) of the Ascó-Vandellós Nuclear Association (ANAV). Compliance with the conditions established in the positive assessment of revision 1 of the plan had been previously verified through the performance of two inspections.

The licensee sends a Procura follow up six-month report to the CSN where it informs about the programme progress status. In addition, a follow up committee was created at the CSN to coordinate all follow up activities and to ensure the Plan objectives are achieved. The committee held two meetings in 2010.

Apart from the two inspections above mentioned, three inspections were conducted in 2010 to supervise the status of the current activities in the five lines of action related to the cultural and behavioural reinforcement of the Procura Plan and the implementation of the recommendations stated in the diagnosis reports.

### Nuclear power plant action plans for 2011-2015

Upon the CSN's request, power licensees updated the reports and plans submitted the previous year, adapting them to the 2011-2015 period. Such reports deal with improvement and investment plans to maintain and reinforce safety issues, including technological update, facilities maintenance, organisational improvements, personnel training, operational experience analysis, equipment renovation and staffing.

The analyses were submitted to the CSN in January 2011 in order to include the results for 2010, and in February and March, the CSN's Plenary held meetings with each owner in order to review the conclusions of those analyses, the proposed improvements and investment plans, and any necessary resources to implement them.

#### 2.1.4. Conclusions

According to the SISC's assessment of the results and considering other aspects related to power plant operation, pursuant to this section and the subsequent sections referred to radiological impact, it can be stated that in 2010 the Spanish nuclear power plants operated properly as far as safety is concerned.

## 2.2. Nuclear fuel cycle facilities, waste disposal facilities and research centres

This section refers to the Juzbado fuel assembly manufactory facility, El Cabril radioactive waste storage and the Research Centre for Energy, Environment and Technology (Ciemat). In 2010, the facilities operated within the established safety standards, there being no situations of undue risk.

### Licensing

Throughout 2010, the CSN either approved the authorisation or gave a positive assessment on 12 files related to the following matters:

- Juzbado fuel assembly manufacturing facility: authorisation to increase its enriched uranium storage capacity and the production of fuel from 400 to 500 tons, and approval of the reviews of the following official exploitation documents: Operating Regulation, Physical Protection Plan, Internal Emergency Plan, Quality Management Manual, Operating Technical Specifications, Radiological Protection Manual, and Safety Study.
- El Cabril storage facility: authorisation to use container CE-2b, and approval of the new revisions of Operating Technical Specifications and of the Acceptance Criteria of Storage Units.
- Ciemat: positive assessment of the Site Restoration Plan review, in relation to the PIMIC (Integrated Plan for the Improvement of Ciemat facilities) Dismantling Project, and authorisation to modify installation IR-04, Laboratory of Radiation Biological Effects.

### Inspection and Control

In developing its respective control programmes, the CSN conducted 39 inspections: 17 at Juzbado fuel-assembly manufacturing facility, 12 at El Cabril storage centre, and 10 at Ciemat.

### Reportable Events

At the Juzbado facility there were six reportable events which implied no risk to workers, the population or the environment. All of them were classified as level 0 events on the INES Scale.

The El Cabril radioactive waste storage facility reported six events of the same kind during the year, which did not pose any risk to workers, the population or the environment.

### Sanctions and disciplinary measures

A warning was issued to El Cabril in 2010, since compliance with the official operating document was not ensured: acceptance criteria of disposal units in the acceptance process of one disposal unit generated at Ciemat.

### Relevant issues

As far as Ciemat is concerned, the Council positively assessed the review of the Site Restoration Plan, in relation to the PIMIC-Dismantling project, which was carried out by Enresa. On the other hand, the tasks to be conducted by the Ciemat itself pursuant to the PIMIC-Rehabilitation plan, which is also part of said Site Restoration Plan, were only partially undertaken through specific actions in facility buildings.

Once the tasks included in the PIMIC-Rehabilitation project are in an advanced development stage, so that the final radiological verification may be conducted, the Ciemat shall submit an updated review of the Site Restoration Plan.

The execution of the Integrated Plan for the Improvement of Ciemat Facilities (PIMIC) continued throughout 2010. The characterisation of the walls and foundation slabs of laboratories for radioactive standards and the analysis of enriched uranium solutions was finished as part of the PIMIC-Rehabilitation project. With regard to the PIMIC-Dismantling project, it must be mentioned the completion of the decontamination works in the area known as La Lenteja, between buildings 13 and 53, and the filling of the cavity excavated as part of the dismantling of buried tanks in the reactor building. On 31<sup>st</sup> December 2010, the total number of low and medium activity waste packages stored on the northern and southern platforms at El Cabril was 113,971, which accounts for 63.68% of its total capacity, while the total number of disposal units of very

low activity radioactive waste on the eastern platform was 3512, representing 5.42%

## 2.3. Facilities in the definitive shutdown, dismantling and decommissioning stages

The following fuel cycle nuclear or radioactive facilities are definitively shutdown or in the dismantling and decommissioning phase: Vandellós I NPP, in the shutdown phase following completion of the first dismantling phase; José Cabrera NPP, in the dismantling phase, Elefante uranium concentrate production plant, dismantled and under surveillance; Quercus plant, shutdown; and Andújar uranium mill (FUA), dismantled and under surveillance.

In 2010, the relevant activities in each plant, according to their phase status, were carried out within the safety limits established and without any negative impact on people or the environment.

### Licensing

In 2010, the CSN issued three expert reports in relation to authorisations or positive assessments.

The most important files include:

- José Cabrera NPP: Authorisation by the Radiological Protection Service for the dismantling of the plant.
- Quercus plant: Authorisation for the clearance of organic solution contained in deposit D-604, approval of a new review of the Operation Regulation and favourable report in relation to the extension, until the end of 2011, of the suspension of the licensing process for dismantling, granted for two years in July 2008.

### Inspection and control

In developing its respective control programmes, the CSN conducted 26 inspections: five at Vandellós I NPP, 13 at José Cabrera NPP, three at Quercus plant, two at Elefante plant and three at Andújar uranium facility (FUA).

### Reportable events

On 1 September, the Quercus licensee notified about the spurious activation of the T-02 transformer fire extinction system in the main power substation, causing its plinth to get partially flooded. The incident, which had neither radiological consequences nor any impact on the facility, was caused by damage in two detectors of the fire protection system, which were repaired and put back into operation the following day.

### Sanctions and disciplinary measures

There were no cases.

### Relevant issues

In all facilities definitively shutdown, or in dismantling and decommissioning phases there are environmental radiation surveillance programmes, worker Radiological Protection programmes, physical protection programmes and, if necessary, releases monitoring and radioactive waste management programmes. In 2010, there were no deviations in the execution of any of such programmes.

The water tightness test conducted on the reactor box at Vandellós I every five years had satisfactory results.

In February 2010, the Ministry of Industry, Tourism and Trade authorised the transfer of ownership of José Cabrera NPP from Gas Natural, S.A. to Enresa. In addition, it authorised the new owner to dismantle the facility and granted powers to perform the handling, processing, storage and transportation of nuclear material. All these

authorisations were announced by the CSN in 2009, which further developed a series of complementary technical instructions in 2010, later sent to Enresa.

The suspension period of the licensing process for dismantling at Quercus plant was extended until the end of 2011. Until then, the surveillance and maintenance measures established in the authorisation dated 15 July 2008 of such moratorium shall remain in force in order to ensure the facility is in safe conditions.

## 2.4. Radioactive facilities

Radioactive facilities operated for scientific, medical, agricultural, commercial and industrial purposes in 2010 complying with existing safety regulations and the specific measures for radiation protection of individuals and the environment.

### Licensing

The CSN grants licenses on these facilities with the cooperation of the autonomous communities with which the CSN has signed function-entrustments agreements.

In fiscal 2010, 365 reports were issued on radioactive facilities:

- 52 authorising operation.
- 41 declaring decommissioning.
- 272 authorising different changes.

### Inspection and control

As with licensing, inspection is carried out with the cooperation of the autonomous communities under function assignment agreements. During 2010, 1,815 inspections were carried out in radioactive facilities, of which 776 were performed by the CSN's own personnel and 1,039 by personnel accredited by the CSN assigned to the

autonomous communities under function-entrustment agreements. They are grouped into the following types:

- 103 inspections related to licensing.
- 1,383 inspections to control radioactive facilities.
- 304 inspections to control radiodiagnosis facilities.
- 25 inspections related to incidences, claims or irregularities.

Besides inspections, control of facilities is based on the review of regular reports. In 2009 the CSN received a total of 821 annual reports on radioactive facilities, about 23,000 on diagnosis X-ray facilities, as well as 259 quarterly reports on commercialisation.

As a result of inspections findings, review of the annual reports on facilities, information on radioactive materials and equipment supplied by

commercialisation facilities and data on radioactive waste management provided by Enresa, 380 inspection cards were issued.

Among control procedures, claims were also dealt with. In 2010, 13 claims were filed. For most of them, an inspection was carried out.

#### Events and incidents

In 2010, 21 incidents were reported in radioactive facilities, of which six were caused by operating failures, six by equipment failures, seven by stolen or lost radioactive equipment or sources, and two by fire or deflagration in the facilities or nearby premises.

#### Sanctions and disciplinary measures

In 2010, the CSN recommended the relevant authority opening five disciplinary proceedings. Sanction proposals usually arise when activities requiring authorisation are carried out without such authorisation, when facilities are run by non-licensed personnel or when instructions or requirements are not fulfilled.

**Table 3. Evolution of the number of radioactive facilities**

| Category        | Field of application  | 2006          | 2007          | 2008          | 2009          | 2010          |
|-----------------|-----------------------|---------------|---------------|---------------|---------------|---------------|
| 1 <sup>st</sup> | Radiation             | 1             | 1             | 1             | 1             | 1             |
|                 | <b>Subtotal</b>       | <b>1</b>      | <b>1</b>      | <b>1</b>      | <b>1</b>      | <b>1</b>      |
| 2 <sup>nd</sup> | Commercialisation     | 46            | 51            | 53            | 53            | 58            |
|                 | Research and teaching | 80            | 85            | 89            | 102           | 98            |
|                 | Industry              | 582           | 597           | 604           | 586           | 570           |
|                 | Medicine              | 287           | 309           | 315           | 320           | 322           |
|                 | <b>Subtotal</b>       | <b>995</b>    | <b>1,042</b>  | <b>1,061</b>  | <b>1,061</b>  | <b>1,048</b>  |
| 3 <sup>rd</sup> | Commercialisation     | 13            | 14            | 15            | 17            | 16            |
|                 | Research and teaching | 89            | 95            | 95            | 94            | 97            |
|                 | Industry              | 152           | 157           | 156           | 165           | 182           |
|                 | Medicine              | 57            | 52            | 51            | 49            | 46            |
|                 | <b>Subtotal</b>       | <b>311</b>    | <b>318</b>    | <b>317</b>    | <b>325</b>    | <b>341</b>    |
|                 | Medical X-rays        | 25,902        | 28,438        | 29,714        | 30,475        | 31,437        |
|                 | <b>Total</b>          | <b>27,209</b> | <b>29,799</b> | <b>31,093</b> | <b>31,862</b> | <b>32,827</b> |

Likewise, as a result of evaluation and inspection procedures to control facilities, the CSN imposed 103 disciplinary measures, detecting the infractions and requiring the necessary corrective measures in the short term, of which 40 were imposed by the CSN itself, 28 by the autonomous community of Catalonia, 2 by the autonomous community of the Balearic Islands and 33 by the autonomous community of Basque Country.

### Relevant issues

In 2010, seven informative circulars and a technical instruction were issued on improved management of personal dosimetry in hospitals. Administrative doses are assigned to workers when dosimeter reading is not available for any the reason, whether because the dosimeter is lost, not used, etc.

As part of an attempt to simplify radioactive facilities licensing, Instruction IS-28 of the CSN was released, containing and normalising the operating technical specifications applying to the different kinds of radioactive facilities.

As part of its legislative role, the CSN has continued to send to licensees of radioactive facilities supplementary technical instructions and circulars, containing explanations or interpretations of regulations and encouraging good practices. During the Permanent Forum on Radiological Protection in the healthcare environment (*Foro Permanente sobre Protección Radiológica en el Medio Sanitario*) in 2010, in which the CSN, the Spanish Radiation Protection Society (*Sociedad Española de Protección Radiológica*) and the Spanish Society of Medical Physics (*Sociedad Española de Física Médica*) participate, a paper was completed on patient discharge criteria and radiation protection measures for the public after a metabolic treatment with iodine-131.

In 2010 the INES Scale continued to be applied on tests to classify events in radioactive facilities, thus 21 events were classified over the year.

## 2.5. Transport of nuclear and radioactive materials

As regards licensing of transport activities, the CSN informed in 2010 the following files:

- Six files of validation of approval certificates of foreign packages.
- Four transport authorisations with special arrangements corresponding to the transport to El Cabril of two radioactive Ra-226/Be sources and three cobalt radiation therapy units, the delivery of two fresh fuel assemblies for demonstration from Juzbado to Almaraz, and transport from Juzbado of several 12-foot Westinghouse 17x17 fresh fuel assemblies to various plants, in Traveller XL casks.

During 2010, 56 inspections were carried out on transport of nuclear substances and radioactive materials: 23 by the CSN itself, and 33 by the autonomous communities in accordance with the duties entrusted to them. This control is completed with the analysis of previous notices and execution reports required by the CSN for transport of fissile materials, high-activity radioactive sources, and radioactive waste; throughout the year, transport notices regarding 74 deliveries of fissile materials and 218 deliveries of radioactive waste made by Enresa, 186 from nuclear facilities and 32 other facilities were analysed.

In 2010, five incidents were registered in the transport of radioactive materials: three road accidents which affected the transport of medical radioactive materials (only in one event there were external damages to the parcel without radiological relevance); in Barajas airport, a parcel

with Kr-85 was lost and was finally found intact; and one radioactive equipment to measure the density of soils was stolen from a vehicle and subsequently recovered.

## 2.6. Manufacturing of radioactive equipment and exemptions

During 2010, the CSN had favourable opinions on 25 files for the approval of 50 models of radioactive devices, which suggests their exemption from being considered as radioactive facility due to their intrinsic security. Seven of them incorporate low-risk radioactive sources, mainly of Ni-63, while the others have X-ray generators.

## 2.7. Services entities

This section includes companies or entities that, subject to the nuclear regulation, provide services to third parties related to radiation protection; among them, radiation protection services (RPS), technical units of radiation protection (TURP), companies for sale and technical assistance for medical X-ray equipment, personal dosimetry services (PDS), and external registered companies.

During 2010, the following activities should be highlighted:

- Regarding radiation protection units and services:
  - The CSN authorised four new RPS and amended the authorisation of two RPS already authorised. The Council also authorised a new TURP, amended the authorisation of six which were already authorised and closed down two. Furthermore, it amended, of its own motion, the authorisations of 30 TURPs in order to match the conditioned ones and adapt them to the provisions of Royal Decrees

35/2008 and 1085/2009. At the end of 2010, 76 RPS and 48 TURPs were authorised.

- The CSN informed the authorisation requested for two TURPs for their exemption from the consideration as radioactive facility of calibration radioactive sources required for their operations.
- 29 inspections were carried out on PRS and 24 on TURPs, with the collaboration of autonomous communities with which agreements have been signed for the entrustment of duties.
- As a consequence of the inspection and control activity, it was proposed that a sanction was imposed on a TURP.
- The Cooperation Forum between the CSN and the Spanish Radiation Protection Society on TURPs, created in 2008, continued its activities. In 2010, the study group on the TURPs' services agreement model concluded its work and remained active with a study group for the definition of technical and human means for the TURPs. Furthermore, two new study groups were created, one to define the approval type certificate of the medical X-ray facilities, and another to establish a model of radiation protection programme applicable to dental clinics with intra-oral imaging systems.
- Regarding companies for sale and technical assistance:
  - The CSN informed the authorisation of 16 new companies for sale and technical assistance, the amendment of the authorisations of four and the closing down of one. At the end of 2010, 310 entities were authorised.

- Regarding dosimetry services:
  - The amendment of the authorisations of three external personal dosimetry services was authorised, as well as of one internal personal dosimetry service.
  - Within the control programme of the 30 authorised dosimetry services, 21 external and 9 internal, 11 inspections were carried out throughout the year.
  - During 2010, the second intercomparison campaign between internal dosimetry services of nuclear power plants and Tecnatom was planned and took place.
  - In May, 2010, the CSN issued, in an informative conference aimed at the PDS, the results of the project carried out by the Institute of Energy Techniques of the Polytechnic University of Catalonia, with the financial aid of the CSN, in order to define a characteristics and calibrations protocol for the systems used in the dosimetry of limbs in Spain.
- Regarding external registered companies:
  - Throughout the year, 72 external companies were registered in the External Companies Registry and, thus, as of December 31, 2010, a total of 1441 companies were registered. Most of such companies perform activities related to nuclear power plants. Inspections made to refuelling nuclear plants include in their scope the verification of the duties of these companies.

of the radiation protection service. Furthermore, 43,020 workers had the corresponding credentials, issued by the CSN, to manage medical radiodiagnosis facilities, and 59,402 to operate said facilities.

In 2010, the CSN granted the following licenses and credentials:

- In nuclear power plants: 15 supervisor licenses, 12 operator licenses, two head of the radiation protection service licenses; and 37 supervisor licenses and 30 operator licenses were extended.
- In fuel-cycle facilities, storage facilities, and facilities undergoing dismantling: five supervisor licenses, four operator licenses, and one head of the radiation protection service license. Also, 10 supervisor licenses and 29 operator licenses were extended.
- In radioactive facilities: 433 new supervisor licenses, 1,158 operator licenses, and 10 head of the radiation protection service licenses. 434 supervisor licenses and 961 operator licenses were extended.
- In medical radiodiagnosis facilities: 1,660 credentials to manage and 1,752 credentials to operate such facilities.

Regarding the courses to obtain licenses and credentials, the CSN approved three new courses for radioactive facilities and authorised the modification of one previously approved. Furthermore, four new courses for the grant of credentials to staff of X-ray facilities were approved.

Control of courses given and corresponding exams gave rise to 56 inspections.

The CSN keeps updated, and makes readily available, in its corporate website, enough course

## 2.8. Personnel licenses

As of December 31, 2010, there were 13,745 licensed workers: 4,018 had supervisor licenses, 9,547 operator licenses, and 180 a diploma of head

materials in order to give the courses aimed at obtaining licenses and credentials in all fields of radioactive and radiodiagnosis facilities.

## 2.9. Uranium mining

The CSN, in 2010, continued informing the authority in charge of autonomous communities on the applications for permits for uranium minerals screening, research, and exploitation. Throughout the year, reports were issued on the following applications: two reports on new research permits to the Department of Economics and Finances of the Regional Government of Catalonia, three reports on extension of the scope, and four reports on the renewal of permits already granted to the Regional Government of Castilla y León in Salamanca.

Furthermore, the Council has supervised compliance with the radioactive requirements of such activities and has reviewed, throughout the year, 19 reports issued by the holders of the authorisations.

## 2.10. Other regulated activities

As of December 31, 2010, 47 companies were authorised to carry out the activities included in Title VII of the Rules for Nuclear and Radioactive Facilities regarding: addition of radioactive substances in the production of consumer goods, import, export, trade and transfer of radioactive materials, radiation generator equipment and consumer goods that incorporate radioactive substances, and technical assistance of such equipment and goods.

During 2010, 12 new authorisations for such activities were informed and amendments to

authorisations of 15 previously authorised companies were approved.

## 2.11. Activities at non-regulated facilities

### Transfers to Enresa

During 2010, the CSN informed of 24 files authorising the transfer of several materials and radioactive sources that were not authorised to Enresa. In 15 of such cases, applicant did not have a radioactive facility.

### Removal of radioactive materials detected in metal materials

Within the framework of the *Protocolo de colaboración sobre la vigilancia radiológica de materiales metálicos* (*Collaboration Protocol on Radiological Monitoring of Metal Materials*), during 2010, the CSN was informed of 100 detections of radiation in metal materials. The detected radiation sources include: indicators with radioluminescent paint, ionisation smoke detectors, radioactive lightning arrester, products with radium and thorium, and contaminated parts, among others, which were transferred to Enresa to be managed as radioactive waste.

It should be reported that slightly contaminated steel dust was detected at the entrance of facilities of Compañía Industrial Asúa Erandio, SA (ASER) from Nervacero. The radiation characterisation of the dust and the facilities in which it was found allowed to deduct that the cause was the fusion of a low-activity source of caesium 137 and to discard the adoption of decontamination measures and measures to manage it as radioactive waste due to the small concentration of radioactive activity.

At the end of 2010, there were 150 metallurgical facilities which complied with the protocol.

### 3. Radiological protection of the exposed workers, the public, and the environment

#### 3.1. Radiological protection of the exposed workers

The amount of workers exposed to ionising radiations who were subject to a dosimetry control in Spain in 2010 increased to 103,934. The collective dose corresponding to all workers was of 22,308 mSv/person. If only significant doses are considered and if the cases in which the annual dose limit may potentially be exceeded are excluded, the average individual dose of such workers is of 0.72 mSv/year. Such data did not compute the administrative doses assigned to workers when a dosimetry reading is not available, regardless of the cause, whether by loss of the dosimeter, lack of use of dosimeter, etc.

99.63% of workers subject to dosimetry control received doses lower than 6 mSv/year, and 99.97% received doses lower than 20 mSv/year. This distribution evidences the good trend of the doses in nuclear and radioactive facilities of our country as compared with the compliance of the limits of doses set forth according to regulations for exposed workers (100 mSv during five years, with an annual maximum of 50 mSv).

In the National Dosimetry Bank, at the end of the dosimetry control period 2010, a total of 16,771,437 dosimetry measurements were registered, corresponding to 295,796 workers and 53,293 facilities.

Throughout 2010, the CSN has issued a total of 3,986 radiation identity cards for workers of 282 companies.

The analysis of the data mentioned shows:

- The highest contribution to the collective dose of all exposed workers of the country pertains to medical radiation facilities, with a 68% of the global collective dose, as the amount of workers exposed of the sector represents 79% of the total.
- In nuclear power plants, the value of average individual dose was significantly reduced as compared with the previous year. As usual, the staff hired has higher values than the staff on payroll, 0.97 mSv/year as compared with 0.75 mSv/year. This situation is similar to that of other countries.

In a three-year calculation (2008 to 2010), a slight reduction of the collective average dose is observed per reactor in PWR plants (pressurised water reactors).

In the three-year period of 2008-2010, in the BWR plants (boiling water reactors), the average collective dose has decreased as compared with those recorded in Europe for the 2007-2009 period and was lower than those obtained in 2006-2009 in this same type of reactor in the U.S.A., which is considered a reference for the Spanish plants with this technology.

- The highest average individual dose, as in previous years, corresponded to workers of the transport sector (2.23 mSv/year), focusing in the transport of radiopharmaceuticals by road. The high-activity of transports, the reduced dimension of the parcels, their manual loading and unloading, and the fact that the supply is divided in few companies and a reduced number of workers, explain the differences in this sector.

During 2010, 10 cases exceeded the regulatory annual dose limits for workers, all in radiation facilities, and they have been investigated in accordance with the established procedure.

**Table 4. Doses received by professionally exposed workers in each of the sectors considered in the 2010 annual report**

| Facilities                                                          | Number of workers | Collective doses<br>(mSv.person) | Individual average dose<br>(mSv/year) (*) |
|---------------------------------------------------------------------|-------------------|----------------------------------|-------------------------------------------|
| Nuclear power plants                                                | 9,286             | 3,037                            | 0.93                                      |
| Fuel cycle, waste disposal facilities and research centres (Ciemat) | 1,187             | 73                               | 0.59                                      |
| Radioactive facilities                                              |                   |                                  |                                           |
| Medical                                                             | 81,801            | 15,092                           | 0.64                                      |
| Industry                                                            | 7,767             | 3,248                            | 1.27                                      |
| Research                                                            | 5,275             | 608                              | 0.42                                      |
| Facilities in the dismantling and decommissioning phase             | 255               | 53                               | 0.84                                      |
| Transport                                                           | 130               | 196                              | 2.23                                      |

(\*) The individual average dose calculation only considers workers who have had dosimetry readings exceeding the fund

### 3.2. Control of releases and environmental radiological surveillance

#### Control of effluents

Liquid and gaseous radioactive effluents from the facilities, during 2010, remained within the common values and are comparable to those of other European and American facilities, as shown by the monitoring and records. The calculated doses attributable to such effluents were, as in previous years, well below the limits of the regulatory doses for the public and represent a small fraction of the effluent limits. In the specific case of nuclear power plants, this fraction does not exceed 1.9% of the dose restriction set forth of 100 mSv/year.

#### Radiological surveillance in the vicinity of the facilities

Processing and analysis of samples taken in the environmental radiation monitoring programmes

implemented in the surroundings of nuclear facilities, fuel-cycle facilities, shutdown facilities, facilities undergoing dismantling and decommissioning, require a period longer than six months in order to obtain results; therefore, as usual, this report informs data corresponding to 2009.

During 2009, within the environmental radiation monitoring programmes of the facilities, 6,553 samples were taken in operating nuclear power plants, 2,130 in fuel-cycle facilities, and 2,330 in shutdown facilities, and facilities undergoing dismantling and decommissioning, including José Cabrera and Vandellós I NPPs.

The results of the monitoring programmes of the 2009 campaign are similar to those of previous years and show, from the radiation point of view, a normal environmental quality in the surroundings of the facilities.

**Table 5. Standardised activity of the radioactive effluents at nuclear power plants (GBq/GWh). Comparison to global average values**

| Radioactive gas effluents    |                      |                             |                      |                             |
|------------------------------|----------------------|-----------------------------|----------------------|-----------------------------|
|                              | PWR                  |                             | BWR                  |                             |
|                              | Spain <sup>(1)</sup> | Unscear 2008 <sup>(2)</sup> | Spain <sup>(1)</sup> | Unscear 2008 <sup>(2)</sup> |
| Noble gases                  | 4.66E-1              | 1.26E+0                     | 2.25E+0              | 5.02E+0                     |
| I-131                        | 1.77E-6              | 3.42E-5                     | 7.71E-5              | 6.85E-5                     |
| Particles                    | 6.88E-7              | 3.42E-6                     | 6.60E-4              | 5.59E-3                     |
| Tritium                      | 1.72E-1              | 2.40E-1                     | 2.21E-1              | 1.83E-1                     |
| C-14                         | 1.60E-02             | 2.51E-2                     | 4.58E-02             | 6.05E-2                     |
| Radioactive liquid effluents |                      |                             |                      |                             |
|                              | PWR                  |                             | BWR                  |                             |
|                              | Spain <sup>(1)</sup> | Unscear 2008 <sup>(2)</sup> | Spain <sup>(1)</sup> | Unscear 2008 <sup>(2)</sup> |
| Total excluding tritium      | 6.48E-4              | 1.26E-3                     | 5.11E-5              | 9.13E-4                     |
| Tritium                      | 2.93E+0              | 2.28E+0                     | 1.18E-1              | 2.05E-1                     |

(1) Average values: 2001-2010.

(2) Average values: 1998-2002.

**Table 6. Fuel cycle facilities and installations in the definitive shutdown, dismantling and decommissioning stage. Activity of liquid and gaseous effluents (Bq). Year 2010**

| Effluents                      | Fuel cycle facilities                      |                                           |                                        |                                         | Facilities in the dismantling and decommissioning phase |  |                     |                              |                      |                                               |
|--------------------------------|--------------------------------------------|-------------------------------------------|----------------------------------------|-----------------------------------------|---------------------------------------------------------|--|---------------------|------------------------------|----------------------|-----------------------------------------------|
|                                | Juzbado                                    |                                           | El Cabril<br>(1)                       |                                         | Ciemat                                                  |  | Quercus<br>(2)      | Vandellós I<br>(3)           | José<br>Cabrera      |                                               |
| Liquid effluents               | 2.04 10 <sup>7</sup>                       |                                           |                                        |                                         | 7.69 10 <sup>6</sup>                                    |  | 1.8 10 <sup>7</sup> | Excluding tritium<br>Tritium | –<br>–               | 1.31 10 <sup>7</sup><br>4.65 10 <sup>10</sup> |
| Gaseous effluents              | 7.18 10 <sup>4</sup>                       |                                           | Total alfa                             | 5.41 10 <sup>3</sup>                    | LDL                                                     |  |                     | Particles                    | 7.06 10 <sup>2</sup> | 1.19 10 <sup>6</sup>                          |
|                                |                                            |                                           | Total beta                             | 1.39 10 <sup>5</sup>                    |                                                         |  |                     | Tritium                      | LDL                  | 2.54 10 <sup>8</sup>                          |
|                                |                                            |                                           | Gamma                                  | LDL                                     |                                                         |  |                     | Alfa                         | 2.94 10 <sup>1</sup> | LDL                                           |
|                                |                                            |                                           | Tritium                                | 9.06 10 <sup>8</sup>                    |                                                         |  |                     | C-14                         | 1.21 10 <sup>1</sup> | —                                             |
|                                | C-14                                       | 2.46 10 <sup>8</sup>                      |                                        |                                         |                                                         |  |                     |                              |                      |                                               |
| Calculated radiological impact | 0.012% de the established dose restriction | 3.70% de the established dose restriction | <1% de la established dose restriction | <1% of the established dose restriction |                                                         |  |                     |                              |                      |                                               |

(1) Liquid effluent zero dumping facility.

(2) Due to the activity interruption, it does not generate gas effluents.

(3) Emissions due to the occasional vent of the vessel and specifically characterised operations.

**Table 7. ERSP. Number of samples taken by the operating nuclear power plants in 2009**

| Sample type  | Garoña       | Almaraz      | Ascó         | Cofrentes  | Vandellós II | Trillo       |
|--------------|--------------|--------------|--------------|------------|--------------|--------------|
| Atmosphere   | 773          | 772          | 825          | 756        | 804          | 770          |
| Water        | 190          | 212          | 150          | 142        | 130          | 143          |
| Food         | 152          | 308          | 115          | 84         | 88           | 139          |
| <b>Total</b> | <b>1,115</b> | <b>1,292</b> | <b>1,090</b> | <b>982</b> | <b>1,022</b> | <b>1,052</b> |

Additionally, the CSN carries out independent environmental radiation monitoring programmes with a volume of samples and determinations that represents 5% of those corresponding to the environmental radiation monitoring programmes. This task is in charge of environmental radiation university laboratories (six) that are hired by the CSN, and the autonomous communities which are entrusted with this task for the facilities within their territory, Catalonia (two) and Valencia (two). In 2009, results of the independent monitoring programmes did not show any significant variation as compared with the results obtained by the respective monitoring programmes.

#### **Radiation surveillance in the rest of the national territory**

The CSN also controlled the environmental radiation quality in all the Spanish territory by means of its measurement networks:

- The Automatic Stations' Network, built by the network of the CSN with 25 stations distributed throughout the Spanish territory and the networks of the communities of Catalonia, Valencia, Extremadura, and Basque Country, that add another 18 stations located in the respective territories. Its objective is to continuously measure the gamma dose rate, radon gas concentration, radioiodine, and alpha and beta emitters in the air.
- The Sample Stations' Network, composed of a total of 20 laboratories that analyse water

samples from rivers and shores, the atmosphere, land and food. This network operates in two modes: dense network, that analyses a great number of samples in many localities of all the territory, and the separated network that treats few samples, but with great accuracy.

Values obtained during 2010 are similar to those of previous years and show a correct radiation condition.

In 2010, the work group has continued its activities for the renewal of the Automatic Stations' Network, which shall be completed in 2011.

#### **Procedure comparison and standardisation campaign**

In order to guarantee the uniformity and reliability of the results obtained in the different environmental radiation monitoring programmes, and as numerous labs participate in their development, the CSN carries out periodic benchmarking between said labs and promotes the creation of work groups for the standardisation of procedures for sampling and measurement of environmental radiation.

During 2010, a campaign aimed at determining low concentrations of natural and artificial isotopes in the diet was commenced. 34 national and 9 foreign labs have participated in the campaign. At the end of 2010, the exercise is in the evaluation phase.

### Specific radiological surveillance programmes

These are environmental radiation monitoring programmes related to lasting exposure cases arising from old procedures or accidents of the past, and their control depends on the competent authority with the favourable assessment of the CSN, in accordance with Title VI of the Rules for Sanitary Protection against Ionising Radiations.

#### *Site monitoring of the former plant Lobo-G*

After closure in August 2004 of the Lobo-G uranium concentrates plant, its old site remains fenced and signposted and is subject to institutional monitoring temporarily in charge of Enusa, formerly in charge of exploiting the plant.

The programme included, in 2009, taking and analysing 50 samples and the results obtained, similar to those of previous periods, did not show any significant radiation incidence for the population.

During 2010, the CSN verified that the conditions of the decommissioning declaration were complied with and that the monitoring programme was carried out with two inspections.

#### *Radiation monitoring in the Palomares area*

Ciemat continues with the radiation monitoring programme set forth after the 1966 accident in which plutonium was dispersed in the area. Its purpose is to detect and follow-up the possible internal contamination of the people, and the measurement and evolution of the residue contamination of the ground.

Results of the monitoring programme of people indicate that the accident has not had any incidences on the health of the inhabitants of the Palomares area.

After successive proceedings carried out by the Government, informed by the CSN, that caused the expropriation of some plots of land, the

temporary occupation of others and the setting of restrictions for use in certain areas, the area is being restored. For such purpose, Ciemat presented, in 2010, based on the three-dimensional radiation characterisation which ended in 2009, the *Restoration Plan*. The *Preliminary Proposal* was approved by the CSN and the assessment of the final Restoration Plan is still pending. The plan sets forth the general guidelines for the process of eliminating the radioactive contamination from soils in Palomares.

In April 2010, the EU created a mission to control the area of Palomares, within the framework of section 35 of the Euratom Treaty. Its purpose was to review the measures to remedy and monitor environmental radiation set forth up to the date and for the future. The conclusions of the monitoring have been that the radiation studies made, the monitoring programmes applied and the restrictions established are appropriate and comply with the requirements of said section 35 of the Euratom Treaty.

### 3.3. Protection against natural sources of radiation

Royal Decree 1439/2010 modified title VII of the Rules for Sanitary Protection against Ionising Radiations and imposed on the persons in charge of activities involving natural sources of radiation the task of studying the radiation impact of its activity on workers and the public, and of declaring its activities to a competent authority, which is usually the industry authority of the autonomous community, for its inclusion in a registry. This demand also applies to the storage and manipulation of radioactive waste generated in such activities.

In order to limit the regulatory obligations related and to ensure their compliance, the CSN has issued criteria and recommendations, and has put in motion a series of pilot studies on significant

industrial activities which are carried out in different universities and scientific institutions.

In 2010, the CSN published a study on the titanium industry made in cooperation with the Universities of Seville and Huelva, and a new agreement was entered into with the University of Basque Country for the study of the radiological risk in arc welding.

As regards protection from exposure to natural sources of radiation, a study with the Autonomous University of Barcelona has been concluded regarding the mining zone of Saelices el Chico, as well as another study with the University of the Balearic Islands regarding the radiation map of the Balearic Islands.

Furthermore, six projects referred to natural radiation and radon carried out by seven universities are still underway, whether within the framework of agreements with the CSN or with its financial aid.

Furthermore, in 2010, the Security Guide GS-11.01 *Guidelines on the competence of laboratories and measurement services of radon in the air* was published.

Throughout the year, the CSN continued informing several authorities on the control of exposure to natural radiation in specific actions:

- The Regional Government of Catalonia on the process of eliminating manufacturing waste of dicalcium phosphate contaminated with natural radioisotopes of the Flix dam.
- The Government of the Murcia Region on the elimination of waste contaminated with natural radioisotopes from the exploitation of phosphate rock for the restoration of the area of El Hondón in Cartagena.
- The Ministry of Industry, Tourism, and Trade on the protection against radiations in the exploitation of the Casablanca oil rig in front of the shore of Tarragona, and in April 2010, it expressed its approval for the waste management proposal presented by Repsol YPF.
- The Ministry of Environment, and Rural and Marine Affairs on the restoration of the phosphogypsum dams contaminated with natural radioisotopes from the Ría de Huelva, originated from the manufacturing of fertilisers by Fertiberia.

### 3.4. Epidemiological survey

At the request of the Congress, under the motion dated 9 December, 2005, the Carlos III Institute of Health (ISCIII) of the Ministry of Science and Innovation, in cooperation with the CSN, has carried out an epidemiological study on the possible effects of ionising radiations on the health of the population in the surroundings of nuclear facilities.

In April, 2010, the Ministry of Health, Social Policy and Equality sent the final report and results of the Epidemiological Study to the Parliament. The main conclusions of the study are the following:

- Accumulated estimated doses that the population in the areas of the study would have received as a consequence of the operation of the facilities are very reduced and well below those that, with the current scientific knowledge, might relate to adverse effects on the health of the population.
- No consistent results showing an increase in mortality due to different types of cancer related to the exposure of people to ionising radiations arising from the operation of the facilities have been detected. Some doses-response timely

associations have been found, but they have not been attributed to the exposure arising from the operation of the facilities.

- Furthermore, no statistically significant mortality excesses due to cancer from natural radiation have been detected.

### 3.5. Emergencies and security

#### 3.5.1. Emergencies

##### Participation in the Emergencies National System

The CSN collaborates with the members of the Emergencies National System: Directorate-General for Civil Protection and Emergencies (DGPCE), Government delegations and sub-delegations, autonomous communities and Emergencies Military Unit (UME), regarding nuclear and radiological emergencies, contributing to this system its Emergency Response Organisation (ERO). Moreover, the Council is responsible for the Spanish participation in international organisations and conventions on these matters.

In this field, the highlighted events throughout the year 2010 are the following:

- Enactment, as informed by the CSN, of the Royal Decree 1564/2010 incorporating the Basic Directive of Civil Protection Planning for Radiological Risks.
- Execution of the collaboration convention between the Ministry of Defence's UME and the CSN on planning, preparation and response for nuclear and radiological emergencies, whereby four work groups were created throughout the year. Under cover of this convention, the project of installation of a backup emergency room has been initiated in the Headquarters of UME.
- The CSN's favourable report of the Special Plan of Radiological Risks of Catalonia.
- Collaboration agreement between the CSN, DGPCE and Enresa as regards formation of acting persons in external plans of nuclear emergency and information to people.
- Collaboration agreement with The Electrical Network of Spain on the mutual operational backup for eventual incidents in the relevant information systems.
- Participation in the National Work Group for the implementation of the European Union's NRBC Plan of Action, organised by the Department of Infrastructure and Monitoring for Situations of Government's Presidential Crisis.
- Attendance of three international meetings of the radiological protection working group of the EU (HERCA) to harmonise radiological criteria in emergencies.
- Delivery, with the DGPCE's National School of Civil Protection, of the fourth edition of the general course of formation of acting persons in nuclear emergencies and the second edition of the practical course of intervention in radiological emergencies. There has been collaboration in the delivery of courses and performance of exercises with the persons responsible for the nuclear emergency plans from Burgos, Cáceres and Guadalajara. Moreover, the "Course of Formation in Radiological Protection in Interventions for Persons Acting in the Civil Guard" has been prepared.
- The collaboration in the drafting of procedures and development of courses for the formation of NRBC specialists of units, dependent on the Ministry of Internal Affairs (Civil Guard and

National Police) and on the Ministry of Defence, has been kept.

- Collaboration in the practical exercise organised by UME: “Practical schools of information and telecommunications systems on emergencies, EPCISUME10”.
- Participation in the Project EU\_SISMICAEX (seismic disaster in Extremadura-Portugal), coordinated by the Board of Extremadura and co-financed by the European Union, which consisted in a simulation of seismic risk with implications in the nuclear power plant of Almaraz.
- Participation in the international simulation PRES-UE-2010 organised by DGPCE in Barajas airport. The exercise simulated a plane accident in an airport with radiological impact.
- The CSN coordinated the exercise INEX-4, organised by the Nuclear Energy Agency (NEA) of the OCDE, which consisted in the simulation of an event of malicious dispersion of radioactive materials in an urban environment. UME was responsible for the acting on site.
- Participation in three international exercises Convex of IAEA proving its new system of emergencies communication and attendance request (EMERCON).
- The CSN took part in four exercises ECURIE of the European Union, three of level 1 and one of level 3.
- The emergency room of the CSN (Salem) was kept permanently in operation 24 hours per day every day of the year.
- In 2010, the new network of communication with nuclear power plants, N2, backup of the

existing one, remained in full operation, and the improvement of the room tools were continued.

- The permanent capability of intervention *in situ* in nuclear or radiological emergency was kept, by means of technical equipment of immediate response provided by a company specialised in radiological protection hired by the CSN.
- Renewal of collaboration contracts or agreements to dispose of two mobile units of radiological environment characteristics, one mobile unit of internal dosimetry and a lab for the measure of environment samples in the event of emergency.
- Management and maintenance of all radiometric equipment and the instrumentation assigned for its use in external plans of nuclear emergency and radiological emergencies.
- Rendering of the dosimetry of the personnel intervening in the off-site nuclear emergency plans by the National Dosimetry Centre of Valencia. In December 2010, a collaboration convention was executed with the National Institute of Health Management (Ingresa) for that purpose.
- Monitoring of measures from networks of automatic stations of radiological surveillance and data from stations of the Radioactivity Warning Network of DGPCE.

#### Regulatory and legal activities

- Throughout the year 2010, modifications were performed in relation to the site emergency plans of the Santa María de Garoña, Vandellós II and José Cabrera NPPs, the Juzbado fuel manufacturing facility, the El Cabril radioactive waste disposal facility and the Quercus concentrates plant were informed.

- In 2010, the mixed group Unesa-CSN, formed to analyse the text of some of the initiating events of the site emergency plan (SEP), finished its work. As a result of the group's work, the Unesa CEN-33-13 *Classification of emergencies and list of initiating events of nuclear power station SEP's* guide has been revised.

## Events

During 2010, the CSN's Emergency Response Organisation was activated on two occasions: on June 11, as a consequence of the meltdown of a caesium source in the steelyard of Nervacero in Valle de Trápaga (Vizcaya) and on September 8, as a result of the operations of tracing of radioactive equipment stolen in Montoro dam (Ciudad Real).

By means of European Union's Ecurie system, during 2010 Salem received three notices of international incidents, none of which had any radiological impact in the Spanish territory.

As regards national incidents, the Salem received during 2010 31 notices, 21 of radioactive installations, six regarding the transport of radioactive substances, two on findings of uncontrolled radioactive material, a reportable event in a fuel cycle installation and the communication of a hypothetical risk situation in a radioactive installation. To these notices should be added those communicated to the Salem regarding events in nuclear power plants, mentioned in Section 2.1.1 hereof.

## 3.5.2. Security of nuclear materials and facilities

During 2010, the CSN has performed the following activities, among others:

- Information of project of Royal Decree which establishes measures for protection of Spanish critical infrastructures, incorporating the respective directive of the European Union.
- Favourable information of Physical Protection plans of Ciemat and El Cabril, and revision of operational regulations of all nuclear installations in order to verify the correct implementation of physical safety in their operation.
- Inspection of physical protection systems of NPPs of Ascó, Cofrentes, Vandellós II, Trillo, Ciemat and radioactive waste disposal facility of El Cabril, in order to perform monitoring and control of the adaptation of said systems and compliance with requirements established in Instruction IS-09 of the CSN. Likewise, inspection of physical protection of the José Cabrera NPP and its Individualised spent fuel Temporary Storage (ITS) facility, as a result of the ownership transfer from Unión Fenosa to Enresa.
- Completion of works for the integration in Integrated Plant Supervision System (SISC) of the strategic strength of physical safety, including procedures of Monitoring Basic Plan, performance indicators, and process of determination of importance for the purposes of safety of findings arising from inspections. Its implementation in evidence stage will be performed in 2011.
- Determination of the basis for the definition, use, implementation and maintenance of a Design Basis Threat in the national field, in collaboration with MI and advice from the IAEA.
- The CSN signed a response protocol in the event of detection of illegal traffic or unnoticed movement of radioactive material in the Nation's ports of interest with the Ministry of Internal Affairs; Ministry of Industry, Tourism and Trade; Ministry of Foreign Affairs and Cooperation; Ministry of Public Works; Enresa; and the National Tax Administration Agency.

- In the field of international cooperation, the participation in activities about security brought by IAEA, such as revision of various rules and collaboration in delivery of four international courses. Moreover, attendance to a training course for inspectors delivered by NRC and to a Training Regional Course (RTC) about security culture held in Paris.
- The CSN participated with AEAT, National Police Corps and Civil Guard, in the seminary held in Germany and organised within the Global Initiative to Combat Nuclear Terrorism, which was co-led by the U.S. And Russia, and had the implementation of detection infrastructures of nuclear material as main subject.

## 4. Radioactive waste

### 4.1. Management of spent fuel and high-level radioactive waste

The number of spent fuel assemblies as of 31 December 2010 in nuclear power plants was 12,250, of which 5,453 were from boiling water nuclear power stations (BWR), and 6,797 from pressurised water plants (PWR). Of these assemblies, 11,453 are stored in the relevant plant pools and the remainder 797, in the individualised temporary storage (ITS) facilities at Trillo (20 containers) and José Cabrera (12 containers).

The inventory of spent fuel and the situation of storage facilities of nuclear power plants are reflected in table 8.

Control has over spent fuel and operational conditions in storage pools and ITS of nuclear power plants has been kept, and three specific inspections to Trillo, Ascó I y II y Vandellós II have been performed.

Due to the next saturation of pools of the two units of the Ascó plant, the licensing process for building an individualised temporary storage (ITS)

at the plant site has been initiated, and it is based on the use of HI-STORM storage casks.

During 2010, the CSN favourably informed of the study of the storage system safety HI-STORM 100 for the fuel in Ascó, submitted by Enresa.

In 2010, the CSN published the IS-29 Council Instruction on *Safety criteria in temporary storage installations of spent fuel and high-level radioactive waste*.

### 4.2. Management of intermediate and low level radioactive waste

Solid low and intermediate level radioactive waste generated in nuclear and radioactive installations is managed in the disposal facility of El Cabril, which has 28 disposal cells for that purpose.

In 2010, El Cabril received 5,108 waste packages or containment units, plus 28 samples of low and intermediate level radioactive wastes:

- 4,049 packages and 28 samples from nuclear facilities.
- 1,059 packages or containment units of radioactive facilities.

**Table 8. Inventory of irradiated fuel from Spanish nuclear power plants and situation of the relevant storage facilities by the end of 2010**

|                          | José Cabrera | Garoña | Almaraz I | Almaraz II | Ascó I | Ascó II | Cofrentes | Vandellós II | Trillo     |      |
|--------------------------|--------------|--------|-----------|------------|--------|---------|-----------|--------------|------------|------|
|                          | ITS (1)      |        |           |            |        |         |           |              | Pool       | ITS  |
| Stored items             | 377          | 1,985  | 1,204     | 1,192      | 1,100  | 1,080   | 3,468     | 908          | 516        | 420  |
| Degree of occupation (%) | –            | 90     | 73        | 72         | 87     | 85      | 73        | 63           | 82         | 25   |
| Year of pool saturation  | N/A          | 2015   | 2021      | 2022       | 2013   | 2015    | 2021      | 2020         | N/A<br>(2) | 2043 |

(1) The plant is in the dismantling phase. The spent fuel have been moved to the ITS.

(2) Due to the existence of an ITS, there are no pool saturation problems.

**Table 9. Nuclear power plants: radioactive waste shipments generated and evacuated to El Cabril disposal facility in 2010 and shipments stored at the facility itself, 200-litre drums**

| Facility                      | Conditioned activity<br>(GBq) | Generated shipments | Stored shipments | Stored shipments |
|-------------------------------|-------------------------------|---------------------|------------------|------------------|
| Sta. M <sup>a</sup> de Garoña | 7,010.95                      | 549                 | 554              | 4,092            |
| Almaraz I y II                | 2,157.90                      | 416                 | 498              | 7,075            |
| Ascó I y II                   | 2,866.93                      | 527                 | 444              | 2,796            |
| Cofrentes                     | 6,532.71                      | 936                 | 1,065            | 7,895            |
| Vandellós II                  | 355.24                        | 252                 | 426              | 1,029            |
| Trillo                        | 215.00                        | 181                 | 180              | 610              |
| <b>Totals</b>                 | <b>19,138.73</b>              | <b>2,861</b>        | <b>3,167</b>     | <b>23,497</b>    |

Working nuclear power plants generated in 2010 radioactive waste of said type with an estimated activity of 19,138,73 GBq, presented in 2,861 packages.

The CSN kept the control of treatment and storage systems of radioactive waste from nuclear and fuel cycle facilities, as well as acceptance process of standard packages. During 2010, eight inspections were performed about these aspects: two in Cofrentes plant, one in Almaraz plant, three in Santa María de Garoña plant, one in each installation of José Cabrera and Juzbado.

The CSN also performed the monitoring of Enresa's management of atypical radioactive waste.

Non-authorized radioactive substances and contaminated metallic materials, both mentioned in section 2.12 hereof, are included in this case, along with radioactive lightning rods, 50 of which have been withdrawn this year.

Regarding very low level waste, the CSN has continued its monitoring on the operation of the east platform of El Cabril and on the management of tailings of uranium concentrate plants and restoration of uranium mines. Two inspections have been performed at the mining site of Saelices El Chico (Salamanca) and four in disused uranium mines. Also, two inspections have been performed in Valdemascaño and two in Casilla de las Flores, both of which have been already restored.

## 5. External relations

### 5.1. Public information and communication

Throughout 2010, a total of 167 press releases were published, directed to mass media and institutions interested in the areas of competence of the organisation. Likewise, 42 reviews of reportable events were published on the website, according to the notification criteria in force about the events.

In addition, the mass media made 363 direct requests for information, which received the relevant responses. Among the most remarkable matters, we must mention the CSN's plenary meeting decision on the renewal of operation authorisations at the Almaraz and Vandellós II nuclear power plants, for which three press releases and two explanatory notes were offered to the mass media.

Other important subjects of the communication field of the CSN in 2010 were related to the celebration of the organisation's 30<sup>th</sup> anniversary and the publication of the results of the Epidemiological Study, mentioned in section 3.4 hereof.

Throughout the year, 1,380 news items related to the Council were registered. The total number of positive news items published or issued was 1,131, against 26 negative news items and 223 neutral ones.

During 2010, the CSN's corporate website received 263,404 visits. Its continuous review and update, with 2,518 updates throughout last year, brings the knowledge of the Council's work closer to society. Some of the goals during this period have been to reduce barriers through better accessibility, to facilitate the navigation and searching of information, as well as to improve interaction features with the citizen via new services. The CSN

is updating the website design in order to adapt it to the State co-official languages.

Regarding public information, the main activities carried out in 2010 were the following:

- Publications: a total of 40 titles were edited within the Publications Plan (*Alfa* magazine, technical and informative publications) with a run of 38,996 copies. Moreover, 12 publications were edited on CD format (four new titles with a run of 1,100 copies and eight titles were re-edited with a run of 5,300 copies). Also, 15 publications were re-edited in paper with a run of 39,700 copies, and different informative material was created for the Information Centre and for the celebration of the 30<sup>th</sup> anniversary of the CSN creation. The distribution during this period was of 72,284 technical and informative publications.
- Information Centre: reception of 7.620 visitors, mostly from educational centres and institutions. Various information modules pertaining to the centre installations were renewed, and there was collaboration with the Madrid Autonomous Community on the annual open Day for Science, welcoming all those interested in knowing more about the CSN's activities.
- Conferences and exhibitions: CSN attended the following events with a publications stand: *Rules about Installation and Use of X Ray Equipment Event* organised by the Spanish Society for Radiation Protection (SEPR); *XVI Science Day in the Street*, held in La Coruña; *Epidemiological Study Presentation Event*, at Carlos III Health Institute in Madrid; *VI Event about Quality in Control of Environment Radioactivity* at Cáceres University; presentation of the *Annex on Nuclear Safety to the Book of Energy Research in Spain*, at the CSN; *Empirika, Ibero-American Fair of Science, Technology and Innovation* held in Salamanca; and the Conama 10, National Conference of Environment in Madrid.

- Series of conferences: organisation in 2010 of the following conferences: *Electricity Role in a Sustainable Energy Model* (Luis Atienza), *New Activities of NEA/OCDE on Nuclear Safety* (Javier Reig) and *Nuclear Safety in the Ukraine after Chernobyl* (Olena Nykolaichuk).

## 5.2. Institutional relations

The CSN, within its functions, collaborates with a large number of institutions on a national, regional and local level. Apart from these relations, it also cooperates with Parliament and other public institutions, maintains collaboration and advisory bonds with professional and trade unions organisations, and non-governmental associations and organisations related to its activities.

### General Courts

The CSN annually submits to the Parliament and autonomous parliaments pertaining to autonomous communities which have nuclear plants in their territory, the annual report, which presents in detail the activities carried out throughout the year. The said report is annually submitted to the Congress and Senate upon attendance of the Council president before the Industry, Tourism and Trade Commission. Likewise, and as part of the relations with the Courts, the CSN provides response to requests made by various political entities via parliamentary questions and resolutions issued in the Annual Report. During 2010, the CSN forwarded Parliament 29 reports on the 33 resolutions passed regarding the 2008 Annual Report, all of which requiring a response from the organisation. Moreover, reports relating to 21 parliamentary questions were issued.

### Central Government

Regarding CSN relationships with the Central Government, during 2010 the CSN continued with its normal collaboration with the Ministry of Industry, Tourism and Trade.

The CSN has been collaborating with the Ministry of Internal Affairs since 1999, with regard to the competences and functions of both organisations about the physical protection of nuclear and radiological installations, materials and activities, and also regarding the planning, preparedness and response to emergency situations. Section 3.5 hereof describes the actions carried out with the Ministry of Internal Affairs and Ministry of Defence in 2010.

The collaboration with the Ministry of Education related to teacher training activities. During 2010, a seminar was held to present didactic guides to primary and secondary schools regarding radiological protection. With the Ministry of Science and Innovation, through Carlos III Health Institute, regarding the works concerning the Epidemiological Study, the communication steps of the final report submitted to the Congress on April 23, 2010 by the Ministry of Health, Social Policy and Equality were coordinated. Moreover, the CSN signed a framework agreement for collaboration with said Ministry, regarding radiological protection and dosimetry control. In 2010, a collaboration agreement was signed with the National Accreditation Entity (ENAC), in order to confirm the collaboration between both organisations.

### Autonomous communities administrations

In 2010, the annual meeting of the CSN and Government delegates and sub-delegates that have nuclear installations was held. Also, activities with autonomous administrations of Asturias, the Balearic Islands, Catalonia, Galicia, the Canary Islands, Murcia, Navarra, Valencia and Basque Country continued their course through functions assignment agreements. We must emphasise the execution of the revision of the agreement with the Basque Country, by means of which its community acquired experience in the processing of licenses and validation of courses.

### Local administrations

Regarding local administration, the CSN regularly collaborates with municipalities which have nuclear power plants, by actively participating in Information Committees, which are annually held within the nuclear power plants. Likewise, the CSN keeps institutional communication with the Association of Municipalities, local communities with Nuclear Power Plants Areas (AMAC), emphasising during 2010 the collaboration in the spreading of the Epidemiological Study results.

### Social entities, organisations and groups

As regards institutional relations, the CSN maintains relations with national companies and institutions within its regulatory field. In 2010, the CSN executed collaboration agreements with the Spanish Association of Electrical Industry (Unesa) and with Enresa for participating in R&D projects. Moreover, the former collaborated with Enresa on the organisation of a seminar on Design Basis Threat, executed an agreement with Unesa for the assignment of the management of a new communication network for emergencies and signed an agreement of collaboration and information exchange with Electrical Network of Spain.

In this same area of relations we must mention the financing of lecturer's positions, with which the CSN continues collaborating with the Polytechnic University of Catalonia and Polytechnic University of Madrid, and the specific agreements with various universities within the national territory on environmental radiological monitoring. Also, the CSN provided responses to information requests made by non-governmental organisations about environment protection and sustainable development.

### Subsidies

Lastly, and within the Council institutional framework, the help programme has been kept regarding the performance of training, information and disclosure activities related to the CSN activities. Finally, the institutional visits

programme, started in 2008 to promote institutional collaboration and reinforce the organisation transparency, has been kept in force.

## 5.3. International relations

The main activities performed in 2010 were the following:

### Activities within the European Union

Within the framework of the Atomic Questions Group (AQG), which provides advice to the EU Council regarding the Euratom Treaty, the CSN collaborated to give support during the EU's Spanish presidency. Within the European Group of Nuclear Safety Regulators (ENSREG), the most highlighted activities were works carried out to create a European directive for the establishment of a common framework that assures responsible and safe management of spent fuel and radioactive waste, and collaboration and support given to various working groups.

### Regulatory assistance activities

The CSN participates in the cooperation projects for regulatory assistance in nuclear safety (INSC) and pre-accession projects (IPA) of the European Union. The most prominent activities in this field were the following: assistance project for the Jordanian regulatory body, cooperation project with the Egyptian regulatory authority and assistance with the project for the creation of a Moroccan regulatory body. Within IAEA, we must mention the technical cooperation in the Action Plan for the strengthening of regulatory structures in North Africa.

### International conventions about nuclear safety, radiological and physical protection

In 2010, works for the elaboration of the national report were started, which will be presented in the fifth revision meeting of the Convention on Nuclear Safety in April 2011. Also, the draft of the fourth national report for the Joint Convention on

the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management was started, which will be published throughout 2011. Likewise, we must mention the participation in the Radioactive Substances Committee of Ospar Convention.

#### **Bilateral activities with the United States**

The CSN and the United States regulatory body (Nuclear Regulatory Commission, NRC), in 2010, renewed the framework agreement for technical information and cooperation exchange regarding nuclear safety, which included collaboration elements on physical protection.

#### **Bilateral activities with France**

The CSN and French regulatory body, the Nuclear Safety Authority (ASN), continued the complete programme of joint activities, among which we must mention the mutual exchange of personnel and cross-inspections. In 2010, the CSN received an ASN delegation to exchange information about human resources available in both organisations. In December, the bilateral high level meeting took place, which monitors the agreement signed in 2009 for the planning, preparation, and management of emergency nuclear or radiological situations executed by and between both organisations.

#### **Other bilateral agreements**

In 2010, other bilateral meetings were held with regulatory bodies from Germany, Argentina, Lithuania, Portugal, Russia, Sweden, and the Ukraine.

#### **Other international activities**

During 2010, the CSN continued participating in activities and working groups of the International Atomic Energy Agency (IAEA) and the Nuclear Energy Agency (NEA/OCDE). Within IAEA, we must mention the preparation of the follow-up mission of IRRS received at the beginning of 2011 and the works carried out by the IAEA Standards Committee for the development of rules about nuclear safety and radiological protection, which constitutes the main international reference. The CSN also participated in regulatory associations regarding nuclear safety and radiological protection, especially in INRA and WENRA, where we should emphasise the regulatory harmonisation on the basis of criteria established by this association; in HERCA, where a proposal of radiological passport format was developed and agreed, and in the Iberoamerican Nuclear and Radiological Regulators Forum (FORO), which was recognised as an important cooperation forum within the Iberoamerican Summit held in 2010.

## 6. Training and R&D

### 6.1. Training

Due to its specific characteristics, the CSN gives special importance to the training of its staff. The 2010 Training Plan has been prepared so that its goals are aligned with the CSN 2005-2010 Strategic Plan, and it has been structured around seven areas: nuclear safety, radiological protection, development of management, organisation and communication skills; regulations, administration and management; information and quality systems; languages and training of officers in practices.

The global number of hours devoted to staff training has been 33,455 hours, equal to 4.5% of the working day, with a total cost of Euros 634,539.20, *i.e.* an average value of € 1,353/employee. The average staff participation has been 2.6 training courses/person.

In 2010, the first process to assess the management by competences informed model applied to training was completed. It was started in 2009 and it was used to individually assess the training needs of the CSN staff. Data obtained has been the basis of the design of the 2011 Training Plan and of the improvements made in the whole staff professional development process

Furthermore, the presence of the Council has continued to be fostered in conferences, meetings and national and international seminars related to its functional and jurisdictional scope.

### 6.2. Research and development

The activities performed by the CSN in this environment fall under the Research and Development Plan, which establish the

conditions in which the projects to be executed every four-year period will be developed. The Research and Development Plan for the 2008-2011 period is structured in eight programmes or action lines: nuclear fuel and reactor physics; modelling and safety analysis methodology; material behaviour; new technologies; radioactive waste; radiation exposure control; dosimetry and radiobiology; and emergency management and incident analysis. These are the high-level goals to be achieved:

- To contribute to ensure a high level of nuclear safety and radiological protection in the existing facilities, until they reach the end of their life.
- To improve the surveillance and control of workers and public exposure to ionising radiation.
- To continue making progress in the development of radiological protection in medical exposures.
- To have the knowledge and technical means to analyze risks related to future installations.

In 2010, a new R&D information activity management system was implemented to facilitate project follow-up. Furthermore, and based on this new system, other computer applications have started to be developed to facilitate the information exchange with the entities that cooperate with the CSN in R&D projects.

During 2010, and in the framework of the modelling programme and safety analysis methodologies, it is worth mentioning the works that are being carried out regarding the use of reliable fire modelling to predict the effects of a fire at a nuclear power plant, including fires originated outside the plant, regarding tornadoes

and floods, and the commencement of a specific project regarding the frequency and characteristics of the tornadoes that may occur at Spanish nuclear facilities sites.

In 2010, the CSN managed a total of 54 research projects, together with about thirty national and foreign organisations, and with a budget that is almost the same as last year.

## 7. Regulations and standards

### 7.1. CSN technical standards

In 2010 the CSN continued with the efforts to prepare the Council's Instructions (IS) and the Safety Guides (GS).

Most of the instructions and guidelines that are currently being addressed appeared with the development of the regulatory harmonisation commitments acquired within the Western European Nuclear Regulators' Association (WENRA), though efforts are also aimed at completing the regulatory development in areas such as the regulation of radiological protection against natural ionising radiation or the regulation of the decommissioning and the management of radioactive waste.

In 2010, the CSN approved six new Council's Instructions (IS):

- CSN Instruction IS-24 of 19 May 2010, which provides regulations for the filing and retention periods of documents and records of nuclear facilities (BOE No. 133, 1 June 2010).
- CSN Instruction IS-25 of 9 June 2010 on criteria and requirements to make safety probabilistic analysis and their applications to nuclear power plants (BOE No. 153, 24 June 2010).
- CSN Instruction IS-26 of 16 June 2010 on basic nuclear safety requirements applicable to nuclear facilities (BOE No. 165, 8 July 2010).
- CSN Instruction IS-27 of 16 June 2010 on general criteria for nuclear power plant design (BOE No. 165, 8 July 2010).

- CSN Instruction IS-28 of 11 October 2010 on the technical operation specifications to which second and third category radioactive facilities must conform (BOE No. 246, 11 October 2010). Error correction (BOE No. 281, 20 November 2010).
- CSN Instruction IS-29 of 2 November 2010 on safety criteria in temporary storage facilities for spent fuel and high-activity radioactive waste (BOE No. 265, 2 November 2010).

Furthermore, in 2010, the CSN approved a new Safety Guide (GS) with guidelines regarding laboratory conditions and radon measurement services.

### 7.2. National and international regulations

The CSN regulatory framework was affected in 2010 by the approval and official publication of several provisions, amongst which we may highlight the following ones:

- Law No. 6/2010 of 24 March amending the Law on Project Environmental Impact Assessment (Legislative Royal Decree 1/2008 of 11 January), which defines the stages to be performed in the environmental assessment, sets forth conditions regarding the term for the execution of the proceeding and identifies the authors of the environmental impact study.
- Royal Decree 1439/2010 of 5 November, which amends the Regulations on Health Protection against Ionising Radiations, approved by Royal Decree 783/2011 of 6 July. The amendment focuses on Title VII "Natural Radiation Sources" and requires that owners of activities using natural radiation sources perform the necessary studies to determine if there is a significant increase in the exposure of workers or the public to such sources which may not be

considered negligible from a radiological protection point of view.

- Royal Decree 1440/2010 of 5 November approving the CSN Statute. Under the new Statute, the current functions of the Council are organised and harmonised. Some changes are introduced and the Council Plenary and the Presidency are defined as the highest management bodies of the Entity, based on the principle of cooperation and respect for the legitimate exercise of its relevant duties. The Statute sets forth the rules to govern the Advisory Committee for Information and Public Participation, as established in Law No. 33/2007.
- Royal Decree 1564/2010 of 19 November, which approves the Basic Guideline for Planning of Civil Protection against the Radiological Risk. It aims at reinforcing the planning of measures to protect and inform the public in case of radiological emergencies. It contemplates a wide variety of possible accidents, successes and circumstances with possible radiological effects.

Furthermore, the CSN has participated in the fostering and promotion of several regulatory projects including the following ones:

- Analysis of compliance with the national regulations in the Council's Directive 2000/71/Euratom of 25 June 2009, which establishes a community framework for nuclear safety in nuclear facilities.
- Royal Decree that will replace Royal Decree 158/1995 on Physical Protection of Nuclear Materials.

- Proposed amendment to the Regulations on Nuclear and Radioactive Facilities (Royal Decree 1836/1999 of 3 December) to develop the terms of article 37 of the Law on Nuclear Energy regarding the medical tests or those determined by the regulations to verify that the staff of nuclear and radioactive facilities meet the health conditions.
- Law on Civil Liability for Nuclear Damages.

On the other hand, the CSN has continued participating in the following processes related to the regulatory development at the international level.

- Co-operation with the IAEA to offer the Spanish-speaking community the guides of such international organisations in Spanish. By the end of 2010 the translation of almost all the documents requested by the Council had been completed and a list of new guides to be translated at CSN's expense was being prepared.
- Activities in the framework of the IAEA Commission on Rules to develop regulations on nuclear safety and radiological protection, which is the main international reference.
- Activities by WENRA's work teams in connection with the harmonisation of European regulations in the field of nuclear safety.

Finally, it is worth mentioning that in 2010 the Technical Glossary prepared in 2009 was fully revised. It is expected that, during 2011, a new version will be available to be used as reference to prepare the next regulatory documents.

## 8. Management of resources

### 8.1. Human resources

On 31 December 2010, the CSN's staff was formed by 469 workers, 51.80% women and 48.20% men, with an average age of 49 years.

The educational level of the staff working for the CSN is the following: 66.31% are post-graduates, 5.97% are graduates and 27.72% have other qualifications.

In 2009 selection process were started to cover four posts pertaining to the Upper Scale of Nuclear Safety and Radiological Protection Corp, and one for a worker outside the agreement, all of these by way of the general free access system.

In 2010 the four candidates who had passed the relevant selective process in 2009 were appointed as civil servants in the Upper Scale of Nuclear Safety and Radiological Protection Corps. Also, the candidate who passed the selective process for a worker outside the agreement mentioned above was also accepted.

In 2010, three job positions were allocated through the free appointment system and 31 job positions were covered using the competitive promotion and allocation system. The model of acknowledgment of experience in the professional career of the officers working in the Council applied to 32 officers in this fifth edition.

### 8.2. Economic resources

The agency accounting conforms to the General Public Accounting Plan and includes budget accounting (income and expenses) and financial accounting (income account and balance sheet).

#### a) Budget

Income and expense budgets for 2010 amounted to 50.98 million Euros, the same as the initial budgets, which mean a 0.43% reduction compared to the previous fiscal year.

Regarding income, duties paid amounted to 40.03 million Euros, 87.2% of budget execution, with a -3.29% variation compared to the previous year, mainly due to the reduction of the property income and the lack of income from current and capital transfers from the State. 99.4% of the income was for rates.

Regarding expenses, 42.8 million Euros payments were made, 83.91% of budget execution, with a -4% variation compared to 2009.

#### b) Finance

The profit and loss account shows an income in 2010 amounting to 0.89 million Euros.

As regards income, rates for services rendered by the CSN were the main source of finance for CSN and represented 89.48% of the total amount; the remaining 10.52% were for current transfers and subsidies, financial income and other management income.

As regards expenses, 53.95% was for staff expenses, 32.50% for other management expenses; 3.59% for transfers and subsidies; 4.88% for allowances for amortisation; 4.77% for allowances for provisions; and 0.31% for extraordinary expenses.

The balance sheet at the close of the 2010 fiscal year reflects that there is a balance between assets and liabilities, with a total amount of 44.95 million Euros. The asset is composed of the following items: 41.7% corresponds to tangible fixed assets; 5.1% to intangible fixed assets; 18.6% to debtors; 34.2% to treasury; and the remaining percentage to temporary financial investments and timing adjustments. As regards liabilities, 96.4% correspond to own funds,

3.2% to short-term creditors, and 0.4% to provisions for risks and expenses.

### 8.3. Information systems

In 2010, information technology services targeted at citizens consolidated. By Resolution, dated 17 March 2010 of the CSN, the Electronic Office and Electronic Registry was created. Currently, the Electronic Office and the Electronic Registry of the CSN offers citizens and individuals under administration about 43 services. During 2010, work has been addressed to improve the documentary system management and the automation of internal work flows. The implementation of a new documentary management system for the nuclear facilities files

and the commencement of the system of flow of signed documents that is expected to be operative throughout 2011 are worth mentioning.

During 2010, efforts were devoted to contract a contingency centre that will be used by CSN to guarantee the rendering of its essential computer services if they become unavailable for exceptional circumstances. The implementation of the contingency centre will be addressed during the first semester of 2011. The CSN also addressed during 2010 the preparation of a Plan for Adjustment to the National Safety Scheme in order to establish its safety policy regarding the use of the electronic means mentioned in Law No. 11/2007 of 22 June and implement the safety measures required under the Scheme.

## 9. Strategies and management system

### 9.1. Strategic Plan and Annual Work Plan

The Strategic Plan establishes CSN goals and global strategies for a five-year period.

In 2010 the Strategic Plan 2005-2010 expired; thus, a new Strategic Plan for the 2011-2016 period is being prepared. A proposal was submitted to the Board on 21 December 2010.

In this proposal, the new Strategic Plan revolves around a sole main goal: “nuclear and radiological safety”. Strategic main topics for the 2011-2016 period are developed around that goal, supported in the “credibility” as a basic sub goal and in four instrumental goals: efficacy, transparency, neutrality and independence; for the development of the CSN regulatory activity.

Annually, the Annual Work Plan (PAT) shows the operating goals and the most significant activities to be performed by the CSN organisation in each annual exercise.

The 2010 PAT was prepared following the planning model implemented at the CSN, which considers its integration with the Strategic Plan through the guidelines and goals for 2010. The PAT follow-up is performed through a panel board that includes indicators of the evolution of the most significant activities expected and its comparison with the purposes previously established.

### 9.2. Management System

The CSN has implemented a Management System based on IAEA requirements and on the ISO standards, and aimed at strategic, operative and

support processes, reflected in the Management System Manual, the Organisation and Operation Manual, and the procedures that develop them. The CSN process map in the Management System Manual has been revised throughout 2010.

The Management System is subject to permanent improvement through the evaluation of plan and goal performance, internal audits and external evaluations by national and international bodies.

Recommendations and suggestions derived from IAEA's 2008 IRRS Mission have been included in the CSN's Action Plan, which considers the necessary actions for its implementation and regular follow-up by the Institution's Management System Committee.

As a result of the recommendations issued by the IRRS Mission, in 2010 the following improvements were made in the CSN and in the rest of the Spanish regulatory system:

- The internal audit programme for management processes continued. In 2010 a training course was given for internal auditors and new audits have been performed. The audit results allowed the identification of a series of non-conformities related to the management system and its procedures, none of them being safety-related.
- Upon approval of the new CSN Statute in 2010, the Advisory Committee for Information and Public Participation was implemented; its creation meeting was held in February 2011. Furthermore, a process to reorganise the staff was commenced increasing the resources in certain work areas in line with the mission requirements. Likewise, skills in communication, report drafting and team management were included in training plans.

- During this year, a uniform glossary of terms for all regulatory documents with a legal base has been prepared.
- A system has been included to evaluate the new SISC inspection programme and new inspections of operative experience. Also in connection with the SISC, the necessary steps have been taken to include security as a strategic area that will become operative throughout 2011.
- The CSN has collaborated with the Ministry of Industry, Tourism and Trade, and with the Ministry of Internal Affairs and other domestic authorities in the preparation of a Bill of Royal Decree on Physical Protection of nuclear facilities, nuclear materials and transport of nuclear and radioactive material that will set the necessary basis for the definition of the base threat design.
- The annual systematic gathering of the results of inspections to radioactive facilities continues. If applicable, deviations, good practices and other highlights are identified and lessons learned are obtained to improve both the behaviour in connection with radiological safety and protection of the owners of facilities, and the inspection and control practices of the CSN itself.
- A new procedure has been approved and implemented for the inspection of dosimetry services.
- The CSN, the Ministries of Internal Affairs, Economy and Finance; Development, and Industry, Tourism and Trade, and the company Empresa Nacional de Residuos Radiactivos (Enresa) have entered, in the framework of the Megaports initiative, the *Protocol to be followed in the event of detection of inadvertent movement or illicit trafficking of radioactive material in general interest ports*. Such protocol establishes the functions and procedures to be followed by each organisation if a container with radioactive material is detected in any Spanish port.

The CSN requested the IAEA a follow-up mission from the IRRS. The said mission was carried out by the end of January 2011. Through said mission, the IAEA verified the improvements made as a result of the recommendations and suggestions made in 2008.

## Annex I. Main Nuclear Safety Council Board agreements in 2010

| Plenary | Date     | Resolutions                                                                                                                                                                                                      |
|---------|----------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1151    | 03/03/10 | Ascó NPP: Plan for the organisational, cultural and technical reinforcement (Procura), revision 2.                                                                                                               |
| 1151    | 03/03/10 | CSN report on the draft project to amend Law 25/1964 on Nuclear Energy and Annex II of the redrafted text of the Law on Project Environmental Impact Assessment approved by the Legislative Royal Decree 1/2008. |
| 1151    | 03/03/10 | CSN report on the Bill of Royal Decree approving the Basic Standard for Social Protection Planning in the Event of Radiological Risk.                                                                            |
| 1153    | 24/03/10 | Elaboration of inventory of lots affected by radiological contamination, required by article 81.3 of the Regulations on Nuclear and Radioactive Facilities.                                                      |
| 1156    | 28/04/10 | Almaraz NPP: Favourable report as regards the renewal of the operation authorisation for 10 additional years.                                                                                                    |
| 1159    | 19/05/10 | Cofrentes NPP: Proposal for the opening of a disciplinary file (minor infringement for failure to comply with the IS-21 regarding the requirements applicable to design modifications).                          |
| 1160    | 26/05/10 | Vandellós II NPP: Favourable assessment of the report on the closing of the Action Plan for Safety Management Improvement (PAMGS).                                                                               |
| 1161    | 02/06/10 | Action Protocol in the event of unnoticed movement or illegal trading of radioactive material in general interest ports (Megaports).                                                                             |
| 1163    | 16/06/10 | Vandellós II NPP: Favourable report concerning the renewal of the operation authorisation for 10 additional years.                                                                                               |
| 1163    | 16/06/10 | Juzbado fuel factory: Supervision and Follow-Up System (SSJ).                                                                                                                                                    |
| 1163    | 16/06/10 | Council's Instruction IS-26, on basic nuclear safety requirements applicable to nuclear facilities.                                                                                                              |
| 1163    | 16/06/10 | Council's Instruction IS-27 on general criteria for NPP design.                                                                                                                                                  |
| 1165    | 30/06/10 | 5 <sup>th</sup> National NPP Report for the Convention on Nuclear Safety.                                                                                                                                        |
| 1168    | 21/07/10 | Ciemat: Revision 1 of the Site Restoration Plan.                                                                                                                                                                 |
| 1169    | 08/09/10 | Renewal of the technical cooperation framework agreement regarding nuclear security between the US NRC and the CSN.                                                                                              |
| 1173    | 13/10/10 | Vandellós II NPP: Proposal for the opening of a disciplinary file (minor infringement for failure to comply with the ETF on fire-resistant elements).                                                            |
| 1173    | 13/10/10 | Council's Instruction IS-29 on safety criteria in temporary storage facilities for spent fuel and high-activity wastes.                                                                                          |
| 1175    | 03/11/10 | Report on the draft Law establishing measures for the protection of critical infrastructures.                                                                                                                    |
| 1177    | 17/11/10 | Approval of the starting of the Salem 2- UME plan project. Contingency centre of the Emergency room in departments of the Emergency Military Unit (UME).                                                         |
| 1178    | 24/11/10 | Favourable report on the experts' appointment proposal in the Advisory Information and Public Participation Committee.                                                                                           |
| 1181    | 21/12/10 | Ascó NPP: Report on the request by Enresa for a dry storage system HI-STORM 100 for the plant's spent fuel.                                                                                                      |

## Annex II. List of Abbreviations and Acronyms

|        |                                                                                                                                                      |          |                                                                                                                                                  |
|--------|------------------------------------------------------------------------------------------------------------------------------------------------------|----------|--------------------------------------------------------------------------------------------------------------------------------------------------|
| AEAT   | <i>Agencia Estatal de Administración Tributaria</i> : Spanish State Tax Agency.                                                                      | ECURIE   | European Community Urgent Radiological Information Exchange System.                                                                              |
| ANAV   | <i>Asociación Nuclear Ascó-Vandellós II</i> : Nuclear Power Association Ascó-Vandellós II.                                                           | US       | United States.                                                                                                                                   |
| AMAC   | <i>Asociación de Municipios en Áreas de Centrales Nucleares</i> : Association of Municipal Governments in Nuclear Power Plant Areas.                 | Emercon  | Emergency communication and assistance request system.                                                                                           |
| AQG    | European Union Atomic Questions Group.                                                                                                               | ENAC     | <i>Entidad Nacional de Acreditación</i> : National Accreditation Entity.                                                                         |
| ASER   | <i>Compañía Industrial Asúa Erandio S.A.</i> : Asúa Erandio Industrial Corporation.                                                                  | Enresa   | <i>Empresa Nacional de Residuos Radiactivos</i> : Spanish Radioactive Waste Management Agency.                                                   |
| ASN    | <i>Autorité de Sûreté Nucléaire</i> . French Nuclear Safety Authority.                                                                               | ENSREG   | European Nuclear Safety Regulator Group.                                                                                                         |
| BOE    | <i>Boletín Oficial del Estado</i> : State Official Gazette.                                                                                          | EPCISUME | Practical schools of information and emergency telecommunication systems.                                                                        |
| Bq.    | Becquerel.                                                                                                                                           | ETF      | <i>Especificaciones Técnicas de Funcionamiento</i> : Operating Technical Specifications.                                                         |
| BWR    | Boiling Water Reactor.                                                                                                                               | Euratom  | European Atomic Energy Community.                                                                                                                |
| CD     | Compact Disc.                                                                                                                                        | FORO     | <i>Foro Iberoamericano de Organismos Reguladores, Radiológicos y Nucleares</i> : Ibero-American Radiological and Nuclear Regulatory Authorities. |
| Ciemat | <i>Centro de Investigaciones Energéticas, Medioambientales y Tecnológicas</i> : Centre for Energy-Related, Environmental and Technological Research. | FUA      | <i>Fábrica de Uranio de Andújar</i> : Andújar Uranium Factory.                                                                                   |
| COMS   | Cold Overpressure Mitigation System.                                                                                                                 | GBq      | Gigabecquerel.                                                                                                                                   |
| Conama | <i>Congreso Nacional del Medio Ambiente</i> : National Congress on Environment.                                                                      | GS CSN   | <i>Guía de Seguridad del CSN</i> : Safety Guide.                                                                                                 |
| CONVEX | IAEA's International Emergency Exercise.                                                                                                             | GWh      | Gigawatt/ hour.                                                                                                                                  |
| CSN    | <i>Consejo de Seguridad Nacional</i> : Spanish Nuclear Safety Council.                                                                               | HERCA    | Heads of European Radiation Control Authorities.                                                                                                 |
| DGPCE  | <i>Dirección General de Protección Civil y Emergencias</i> : Directorate General for Civil Defence and Emergencies.                                  | HI-STORM | Holtec International Storage and Transfer Operation Reinforced Module.                                                                           |
| DOE    | US Department of Energy.                                                                                                                             | R&D      | Research and Development.                                                                                                                        |
|        |                                                                                                                                                      | INES     | International Nuclear Event Scale.                                                                                                               |
|        |                                                                                                                                                      | INEX     | International Emergency Exercise of the OCDE'S Nuclear Energy Agency.                                                                            |
|        |                                                                                                                                                      | Ingresa  | <i>Instituto Nacional de Gestión Sanitaria</i> : National Institute of Sanitary Management.                                                      |

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| INRA      | International Nuclear Regulators Association.                                                                            | IAEA      | International Atomic Energy Agency.                                                                                                       |
| INSC      | European Union's Instrument for Nuclear Safety Cooperation.                                                              | ORE       | <i>Organización de Respuesta a Emergencias</i> : CSN Emergency Response Organisation.                                                     |
| IPA       | European Union's Instruments for Pre-Accession Assistance.                                                               | OSART     | Operational Safety Review Team.                                                                                                           |
| IR        | <i>Instalación radiactiva</i> : Radioactive Facility.                                                                    | OSPAR     | Convention for the Protection of the Marine Environment of the North-East Atlantic (Oslo-Paris Convention).                               |
| IRRS      | Integrated Regulatory Review Service.                                                                                    | PAMGS     | <i>Plan de Acción de Mejora de la Gestión de la Seguridad de la central Vandellós II</i> : Action Plan for Safety Management Improvement. |
| IS        | <i>Instrucción Técnica del CSN</i> : CSN Technical Instruction.                                                          | PAT       | <i>Plan Anual de Trabajo</i> : Annual Work Plan.                                                                                          |
| ISCIII    | <i>Instituto de Salud Carlos III</i> : Carlos III Health Institute.                                                      | PBI       | <i>Plan Base de Inspección</i> : Inspection Base Plan.                                                                                    |
| ISO       | International Standardisation Organisation.                                                                              | PCI       | <i>Sistema de Protección contra Incendios</i> : Fire-Protection System.                                                                   |
| ITC       | <i>Instrucción Técnica Complementaria</i> : Complementary Technical Instruction.                                         | DP (SISC) | Situation of "Degraded Pillar" of the SICS's diagnosis table.                                                                             |
| ITS       | <i>Almacén Temporal Individualizado</i> : Individual Temporary Storage.                                                  | PEI:      | <i>Plan de Emergencia Interior</i> : Site Emergency Plan.                                                                                 |
| LDL       | <i>Límite Inferior de Detección</i> : Lower Detection Limit.                                                             | PIMIC:    | <i>Plan Integrado de Mejora de las Instalaciones del Ciemat</i> : Integrated Ciemat Facilities Improvement Plan.                          |
| MD (SISC) | Situation of "Multiple Degradations" of the SICS's diagnosis table.                                                      | PGRR      | <i>Plan de Gestión de Residuos Radiactivos y combustible gastado</i> : Radioactive Waste and Spent Fuel Management Plan.                  |
| Megaports | Action Protocol in the event of unnoticed movement or illegal trading of radioactive material in general interest ports. | PRES-UE   | European Union's International Simulation.                                                                                                |
| MITT      | Ministry of Industry, Tourism and Trade.                                                                                 | Procura   | Plan for the Organisational, Cultural and Technical Reinforcement of the Nuclear Association Ascó-Vandellós II A.I.E.                     |
| mSv       | Milisievert.                                                                                                             | PVRA      | <i>Programa de Vigilancia Radiológica Ambiental</i> : Environmental Radiological Surveillance Programme.                                  |
| MW        | Megawatt.                                                                                                                | PVRAIN    | <i>Programa de Vigilancia Radiológica Ambiental Independiente</i> : Independent Environmental Radiological Surveillance Programme.        |
| N/A       | Not Applicable.                                                                                                          |           |                                                                                                                                           |
| NEA       | OCDE's Nuclear Energy Agency.                                                                                            |           |                                                                                                                                           |
| NPP       | Nuclear Power Plant.                                                                                                     |           |                                                                                                                                           |
| NRBCh     | Nuclear, Radiological, Bacteriological and Chemical.                                                                     |           |                                                                                                                                           |
| NRC       | US Nuclear Regulatory Commission.                                                                                        |           |                                                                                                                                           |
| OECD      | Organisation for Economic Cooperation and Development.                                                                   |           |                                                                                                                                           |

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|-----------|----------------------------------------------------------------------------------------------------------------------------------|-----------|-------------------------------------------------------------------------------------------------|
| PWR       | Pressurised Water Reactor.                                                                                                       | SPR       | <i>Servicio de Protección Radiológica:</i> Radiological Protection Service.                     |
| RD        | Royal Decree.                                                                                                                    |           |                                                                                                 |
| REA       | <i>Red de Estaciones Automáticas:</i> Automatic Station Networks.                                                                | Sv        | Sievert.                                                                                        |
| REM       | <i>Red de Estaciones de Muestreo:</i> Sampling Station Networks.                                                                 | T1/2/3/4  | Quarters 1 / 2 / 3 / 4.                                                                         |
| RR (SISC) | Situation of “Regulatory Response” of the SICS’s diagnosis table.                                                                | EU        | European Union.                                                                                 |
| RT (SISC) | Situation of “Regulatory Response” of the SICS’s diagnosis table.                                                                | UME       | <i>Unidad Militar de Emergencias:</i> Military Emergency Response Unit.                         |
| RTC       | IAEA’s Regional Training Course.                                                                                                 | Unesa     | <i>Asociación Española de la Industria Eléctrica:</i> Spanish Electricity Industry Association. |
| Salem     | CSN’s Emergency Room.                                                                                                            | Unesa-CEN | Generic Guides of the Unesa Nuclear Energy Committee.                                           |
| SDP       | <i>Servicio de Dosimetría Personal:</i> Personal Dosimetry Service.                                                              | UNSCEAR   | United Nations Scientific Committee on the Effects of Atomic Radiation.                         |
| SISC      | <i>Sistema Integrado de Supervisión de Centrales Nucleares del CSN:</i> CSN’s Integrated Nuclear Power Plant Supervision System. | UTPR      | <i>Unidad Técnica de Protección Radiológica:</i> Radiological Protection Technical Unit.        |
| SISMICAEX | European Union Project on Seismic Catastrophe Extremadura-Portugal.                                                              | WENRA     | Western European Nuclear Regulators’ Association.                                               |