

# Spanish Nuclear Safety Council report to the Parliament

Year 2012 Summary

**CSN**



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Published and distributed:  
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Graphic design: Pilar Guzmán

Printed by: Elecé Industria Gráfica, S.L.

ISSN: 1576-5237

Legal Deposit: M-21128-2013

Printed on the following type of paper:



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## Introduction

The report of the Nuclear Safety Council on the activities in 2012, as required by the Law by which it was created (Law 15/1980, modified by Law 33/2007), is hereby submitted to the Spanish Congress and Senate and to the regional parliaments of those autonomous communities in which there are nuclear facilities.

This report describes the main activities that the CSN has performed during 2012, in keeping with the functions assigned to it by Law 15/1980, for the supervision and licensing of installations and activities relating to ionising radiations and to any other activity relating to nuclear safety and radiological protection in the country.

Throughout the year there have been two renewals in the composition of the Nuclear Safety Council: the replacement of a commissioner who retired in May and the appointment of the new president and two commissioners in December.

As in 2011, the accident that occurred at the Fukushima nuclear power plant in Japan has been a priority issue for the CSN, more specifically as regards the measures agreed to in the international scope to prevent this type of events and provide the nuclear power plants with the capacity to withstand extreme natural events beyond their design basis. In this respect, with the stress tests established by the European Union for its member countries having been concluded in 2011, this last year has seen the performance of international activities for the validation of the results obtained and for the implementation of the improvements deriving from the stress tests.

The aforementioned international validation, carried out during the early months of 2011, consisted of a peer review process in which the different European regulators submitted the results of the stress tests performed in their respective countries for examination by means of a series of *in situ* checking visits. The conclusions of this process were presented publicly in national and international seminars. Finally, and in accordance with the agreement of the European Nuclear Safety Regulators Group (ENSREG), the CSN, like the rest of the EU regulators, drew up and submitted to the European Commission the National post-Fukushima Action Plan, a report which was submitted to Congress in December 2012.

This plan reflects the technical instructions issued by the CSN to the licensees of the nuclear power plants for the application of important improvements, by way of a programme divided into different phases and scheduled for completion in 2016. These improvements range from the installation of new equipment and systems, such as passive hydrogen recombiners or the filtered venting of the containment for all the reactors, to the start-up of a National Emergency Support Centre (ESP), with specialist equipment and personnel, capable of intervening at any plant in the country.

The performance of the installations and activities regulated by the CSN has been correct throughout 2012 and has not implied any undue risk for persons or the environment.

In particular, and as was underlined by the Integrated Plant Supervision System (SISC), the performance of the nuclear power plants was in the basic situation of normality for 65% of the time, with the application of standard inspection and control programmes, a situation known as *licensee response* in the SISC action matrix. For the remaining 35% of the time, special regulatory attention was required from the CSN within the framework contemplated by the system, with preferential dedication to the two groups of the Ascó plant, which have remained throughout the year in the matrix column known as *regulatory response*, including one quarter in which Ascó I was in a *degraded pillar* situation.

The Spanish nuclear power plants reported 49 events in accordance with Nuclear Safety Council instruction IS-10, 46 of which were classified on level zero, of no significance for safety, on the INES Scale. The other three were classified on level 1 of this scale: two related to an error detected in the safety injection actuation logic, affecting both groups of the Ascó plant, and the other, at Vandellós II, corresponded to the identification of an anomaly in the isolation of safety systems that might lead to failures in the event of an earthquake.

In relation to the operational future of the Santa María de Garoña nuclear power plant, the CSN reported favourably in response to the request by the Ministry of Industry, Energy and Tourism regarding the possible extension of its operating lifetime for an additional six-year period following the limit date established in the operating authorisation of July 3<sup>rd</sup> 2009. It subsequently reported unfavourably on the licensee's request for extension of the term established to request such extension. In view of the possibility of the Santa María de Garoña plant having to shut down on July 6<sup>th</sup> 2013 due to not having applied for the renewal of its authorisation, the CSN issued a Complementary Technical Instruction requesting the documentation that would allow it to report on the declaration of definitive shutdown that would be issued by the Ministry of Industry, Energy and Tourism in this case.

The doses received by workers professionally exposed to ionising radiations continue to show very low average individual values. Dosimetry controls have been applied to 105,605 professionally exposed workers, with an average individual dose of 0.74 mSv/year. These data are included in the CSN's National Dosimetry Bank, where all the dosimetry histories of professionally exposed workers have been kept since 1985.

The data provided by the different environmental radiological surveillance networks in place demonstrate that the radiological quality of the environment, both in the vicinity of nuclear facilities and throughout the national territory overall, continues to be normal.



The CSN's regulatory activity in relation to licensing and control remains at the level of previous years, with 487 proposals for technical assessment having been submitted to the Council in relation to nuclear and fuel cycle facilities, installations in dismantling or decommissioning phase, radioactive facilities, companies providing services and transport for nuclear and radioactive materials and 3,802 new licences for operators in nuclear and radioactive facilities.

The CSN has continued its efforts in relation to the inspection of regulated installations and activities and has carried out a total 2,123 inspections: 158 at nuclear power plants, 34 at other nuclear and fuel cycle facilities, 20 at installations in dismantling or decommissioning phase, 69 on the transport of nuclear and radioactive materials and 1,842 at radioactive facilities, radiodiagnosis installations and companies providing radiological protection services.

Making use of its coercive power, the CSN has proposed the initiation of three sanctions proceedings, two in relation to nuclear power plants and one to a radioactive facility, in all cases for minor infringements. It has also issued 63 warnings, four to nuclear power plants and the rest to radioactive facilities.

For its part, the Nuclear Safety Council has continued to give maximum priority to promoting the development of technical standards, instructions and safety guides. Council Instruction IS-34 on the transport of radioactive material has been approved, as have five safety guides, three –GS-11.02, 03 and 04– on the control of exposures to natural radiation sources, one –GS-03.01– on the manufacturing of nuclear fuel and another –GS-08.02– on security plans relating to nuclear facilities and materials.

The achievement of a high degree of transparency in communication with society continues to be a priority area for the CSN, in keeping with what is set out in its Law of Creation and in the Strategic Plan for 2011-2016. In this context, all the recommendations issued by the Advisory Committee on Public Information and Participation in relation to nuclear safety and radiological protection during its third and fourth meetings held in May and October 2012 have been approved and implemented.

In the area of international relations, the CSN has continued to play an active role as the Spanish representative in the relevant international groups regarding nuclear and radiological safety. In 2012 the *International Seminar on the Management of Communications in Crisis Situations*, jointly organised by the CSN and the OECD Nuclear Energy Agency (NEA) was held in Madrid.

The CSN's efforts in promoting Research and Development in its specialist fields, in keeping with what is set out in the Law by which it was created, materialised in 2012 in the performance of 74 research projects with a budget amounting to 3.1 million Euros, many undertaken in collaboration with national and overseas institutions. The

Research and Development Plan for the period 2012-2015, which establishes 12 areas of work, was approved at the beginning of the year.

Furthermore, a new call for the awarding of subsidies for the performance of Research and Development projects was issued in 2012, with a maximum duration of three years, a total budget of 1,316,000 Euros and 14 areas of research proposed.

As of December 31<sup>st</sup> 2012, the workforce of the organisation amounted to 457 persons. Mention may be made of the fact that the average age of the staff is 50, that the number of women at the CSN represents 53% of the total workforce and that 68% of the personnel are post-graduates, 6% graduates and 26% the holders of other qualifications.

Finally, it is pointed out that the definitive budget of the CSN in 2012 amounted to 47.287 million Euros, a reduction of 1.65% with respect to the previous year.

## 1. The Spanish Nuclear Safety Council

As of the end of 2012, the Nuclear Safety Council was made up of the following members:

- President: Fernando Marti Scharfhausen (Royal Decree 1732/2012, of December 28<sup>th</sup>).
- Commissioner: Antoni Gurguí i Ferrer (Royal Decree 307/2009, of March 6<sup>th</sup>).
- Commissioner: Rosario Velasco García (Royal Decree 1125/2011, of July 22<sup>nd</sup>).
- Commissioner: Fernando Vicente Castelló Boronat (Royal Decree 803/2012, of May 11<sup>th</sup>).
- Commissioner: Cristina Narbona Ruiz (Royal Decree 1733/2012, of December 28<sup>th</sup>).
- Secretary general: Purificación Gutiérrez López (Royal Decree 318/2007, of March 2<sup>nd</sup>).

On December 28<sup>th</sup> 2012, the previous president Carmen Martínez Ten was replaced by the new president Fernando Marti Scharfhausen, due to her term having come to an end, and the previous vice-president Antonio Colino Martínez was replaced by the new commissioner Cristina Narbona Ruiz.

On February 22<sup>nd</sup> 2013, commissioners Rosario Velasco García, appointed on July 22<sup>nd</sup> 2011, and Fernando Vicente Castelló Boronat, appointed on May 11<sup>th</sup> 2012, in replacement respectively of Francisco Fernández Moreno and Luis Gámir Casares, who left their posts as commissioner and vice-president due to their having reached retirement age, were endorsed for a new six-year term as CSN commissioners. In addition, on March 8<sup>th</sup> 2013 the secretary general Purificación Gutiérrez López left her post and on April 12<sup>th</sup> María Luisa Rodríguez López was appointed to it.

Consequently, as this report was completed in 2013, the composition of the Nuclear Safety Council is currently as follows:

- President: Fernando Marti Scharfhausen (Royal Decree 1732/2012, of December 28<sup>th</sup>).
- Vice-president: Rosario Velasco García (Royal Decree 138/2013, of February 23<sup>rd</sup>).
- Commissioner: Antoni Gurguí i Ferrer (Royal Decree 307/2009, of March 6<sup>th</sup>).
- Commissioner: Cristina Narbona Ruiz (Royal Decree 1733/2012, of December 28<sup>th</sup>).
- Commissioner: Fernando Vicente Castelló Boronat (Royal Decree 139/2013, of February 23<sup>rd</sup>).
- Secretary general: María Luisa Rodríguez López (Royal Decree 268/2013, of April 12<sup>th</sup>).

### 1.1. Plenary Meetings of Commissioners and Commissions of the Council

#### Plenary

During 2012 the Nuclear Safety Council held 40 plenary sessions, 37 of them ordinary in type, one extraordinary and two unanimously agreed to without a previous call.

As the governing body, the Plenary Meeting of Commissioners had adopted a total of 427 agreements during its plenary sessions, within the context of the functions and competences assigned in its Statute currently in force. Of these agreements, 99.5% were adopted unanimously and without the need for a vote.

Of the agreements adopted, 44% related to licensing and control issues, 3.5% to questions of regulations and standards, 2.5% to coercive matters, 11.9% to agreements, contracts and

arrangements and 38.1% to other issues relating to internal organisation or procedures.

Overall, 50% of the agreements reached in 2012 refer to the material performance of the Council's regulatory functions, the remaining 50% referring to organisational or procedural aspects or aspects supporting regulation.

Table 1 shows the main agreements reached by the Board of Commissioners of the Nuclear Safety Council in its sessions during the year. The main

agreements are considered to be those relating to plant operating authorizations, safety significant licensing and control activities, the issuing of new regulations or CSN technical standards, coercive actions and important decisions regarding internal organisation or strategies.

The minutes of the sessions of the Plenary Meetings of Commissioners of the Nuclear Safety Council and the decisions on which authorisations are based are available for general consultation on the CSN website ([www.csn.es](http://www.csn.es)).

**Table 1. Main agreements reached during the plenary sessions of the Nuclear Safety Council in 2012**

No. Agreement Meeting	Date	Agreement
6	1215 18/01/12	Approval of CSN Instruction IS-34 on criteria to be applied to activities relating to the transport of radioactive materials.
7	1215 18/01/12	Approval of CSN Safety Guide GS-11.02 on the control of exposures to natural radiation sources.
8	1215 18/01/12	Approval of CSN Safety Guide GS-03.01 on modifications at nuclear fuel manufacturing facilities.
9	1215 18/01/12	Approval of revision 1 of CSN Safety Guide GS-06.03 on help in drawing up the provisions to be applied in the event of an emergency and applicable to the transport by road of radioactive materials.
42	1219 15/02/12	Favourable report on the request made by Ascó nuclear power plant regarding transition to standard NFPA 805 on protection against fires, in accordance with article 3.2.7 of IS-30 on the requirements of the fire-fighting programme at nuclear power plants.
52	1220 17/02/12	Approval of the CSN report issued in response to the request from the Ministry of Industry, Energy and Tourism regarding the possible modification of the Ministerial Order relating to the current permit for Garoña nuclear power plant.
85	1224 14/03/12	Approval of the Complementary Technical Instructions issued to the nuclear power plants in relation to the results of the stress tests carried out as a result of the Fukushima accident.
112	1226 28/03/12	Approval of the CSN R&D Plan for the period 2012-2015.
186	1234 13/06/12	Approval of the Complementary Technical Instruction issued to José Cabrera nuclear power plant on measures to guarantee the fuel handling capability and respond to events beyond the design basis of the ATI facility.
196	1235 20/06/12	Favourable report on the proposal issued by Cofrentes nuclear power plant regarding adaptation to articles 28.2 and 28.3 of the Nuclear Energy Act, Law 25/1964, in relation to single ownership of the plant.

**Table 1. Main agreements reached during the plenary sessions of the Nuclear Safety Council in 2012 (continuation)**

No.	Agreement Meeting	Date	Agreement
233	1238	11/07/12	Approval of the Complementary Technical Instruction issued to Garoña nuclear power plant on the conditioned application standards applicable in the event of the option to renew the operating permit for a period of no more than six years being selected.
242	1238	11/07/12	Approval of CSN Safety Guide GS-08.02 on the preparation, content and format of physical protection plans for nuclear facilities and materials.
254	1240	18/07/12	Approval of the Complementary Technical Instruction issued to the nuclear power plants regarding compliance with the ITC's of July 1st 2011 on events potentially involving the loss of large areas of the plant.
266	1241	25/07/12	Approval of the Technical Instructions issued to Garoña nuclear power plant regarding the request for a new operating permit for a period of no more than six years.
285	1242	31/08/12	Unfavourable report on the request made by Garoña nuclear power plant for extension of the limit date established in Ministerial Order IET/1453/2012 for submittal of the request for a new operating permit for a period of no more than six years.
290	1244	12/09/12	Approval of a Complementary Technical Instruction issued to Garoña nuclear power plant regarding the submittal of official operating documents associated with the declaration of definitive shutdown.
322	1246	26/09/12	Favourable report on the renewal of physical protection plans and authorisations of operating nuclear power plants and the Juzbado fuel manufacturing facility.
333	1247	03/10/12	Approval of the record of the entry into force of the revision agreement regarding the extension of the agreement for the entrustment of functions between the CSN and the autonomous community of the Basque Country.
341	1248	04/10/12	Request for appearance of the President of the CSN before the Congress to report on the results of the stress tests carried out at the Spanish nuclear power plants as a result of the Fukushima accident.
370	1251	31/10/12	Favourable report on revision 1 of the certificate for the HI-STAR 100 transport package model, requested by Enresa, applicable to the spent fuel casks for the Jose Cabrera and Ascó plants.
376	1251	31/10/12	Adoption of the 4th Recommendation of the Advisory Committee on Public Information and Participation and approval of a schedule of activities.
400	1254	12/12/12	Favourable report on the request by Almaraz nuclear power plant for extension of the period for the implementation of the modifications required in condition 10 of the operating permit currently in force.
409	1254	12/12/12	Approval of CSN Safety Guide GS-11.03 on the methodology for assessment of radiological impact in NORM industries.
410	1254	12/12/12	Approval of CSN Safety Guide GS-11.04 on the methodology for assessment of exposure to radon in the work place.
415	1255	19/12/12	Approval of the National Action Plan requested by ENSREG in relation to the stress tests carried out at the Spanish nuclear power plants as a result of the Fukushima accident.

**Table 1. Main agreements reached during the plenary sessions of the Nuclear Safety Council in 2012 (continuation)**

No.	Agreement Meeting	Date	Agreement
416	1255	19/12/12	Approval of the Complementary Technical Instruction issued to Trillo nuclear power plant regarding conditioned application standards for renewal of the plant operating permit, which expires in 2014.
423	1255	19/12/12	Approval of the report on the Order of the Ministry of Industry, Energy and Tourism establishing criteria for the management of wastes generated in activities performed using materials containing natural radionuclides.

### Council Commissions

The Council Commissions have continued to drive the activities assigned to the organisation in the areas of strategic planning, standards, external relations, resources and training and Research and Development, under the leadership of the different members of the Council. The following are particularly noteworthy among the main issues dealt with by the Council Commissions:

- Creation of a system for the follow-up, development and evaluation of the Strategic Plan, facilitating its fit with the Annual Work Plans and Sector-Specific Plans and allowing for the drawing up of the future Strategic Plan when appropriate.
- Planning of the strategy for the development of CSN technical standards.
- Issuing of a safety guide to harmonise the response of the regulators to emergency situations.
- Action Plan for follow-up of the European Union's stress tests and the CSN's participation in the second extraordinary meeting of the Convention on Nuclear Safety (Vienna, August 27<sup>th</sup> to 31<sup>st</sup> 2012).
- CSN Communication Plan.
- NEA communication workshop and conclusions adopted during the international meeting

organised in Madrid by the NEA in collaboration with the Nuclear Safety Council.

- Execution of the budget and closure of the 2011 financial year.
- Status and forecasts of the computer projects and Annual information technologies Work Plan.
- Management of human resources for 2012.
- Participation in international projects arising from the Fukushima accident.
- Activities included in the CEIDEN Technology Platform.

The minutes of the meetings of the Council Commissions are also available for general consultation on the CSN website ([www.csn.es](http://www.csn.es)).

Complementary to the Council Commissions and under the presidency of the Secretariat General of the Council, the Nuclear Safety and Radiological Protection Commission has as its mission the provision of information for the members of the Council regarding issues expected to be presented to the Board of Commissioners in the short term by the technical directions, as well as to serve as a forum for open debate on proposals or issues of particular interest or technical complexity.

The following were particularly significant among the main issues dealt with by this commission in 2012:

- CSN actions in the wake of the accident at Fukushima nuclear power plant in Japan, the stress tests and the international peer review.
- Agreements for the entrustment of CSN functions to regional authorities.
- The Doel NPP vessel incident and its impact on the Spanish nuclear power plants.
- The status of the fire-fighting programme at Almaraz nuclear power plant.

## 1.2. Advisory Committee on Public Information and Participation

The mission of the Advisory Committee on Public Information and Participation is to issue recommendations to the CSN in order to promote and improve transparency, access to information and public participation in areas of competence of the CSN.

The third meeting of the Advisory Committee took place on May 21<sup>st</sup> 2012 and was divided into two phases. In the first of these, which was informative in nature, the CSN brought up the following questions, among others:

- Operation of the *Protocol on the radiological surveillance of metallic materials*.
- The possible modification of the Ministerial Order on the definitive shutdown of the Santa María de Garoña plant.
- The results of the stress tests carried out at the Spanish nuclear power plants in the wake of the Fukushima accident.
- The peer review of the results of these tests undertaken by the European Union.

During the second phase, and following the ensuing debate, the Advisory Committee agreed to issue the following recommendations:

- The CSN is to undertake informative actions regarding the Palomares accident.
- Maximum efforts are to be made to spread information on the nuclear power plant emergency plans, especially in the immediate vicinity of these facilities.
- The holding of a public conference on the results of the stress tests carried out at the Spanish nuclear power plants.

The fourth meeting of the Advisory Committee was held on October 25<sup>th</sup> 2012. The CSN first reported on the adoption of the recommendations made by the Advisory Committee during its previous meeting and on the implementation of an action plan for compliance with them.

The CSN also reported on the administrative situation of Santa María de Garoña nuclear power plant, and also on the problems detected in the material of the vessel at the Doel plant in Belgium.

Following a brief debate, during which the usefulness of this type of activities was underlined, the committee approved the following recommendation in the terms proposed by the Analysis Commission.

- The performance of studies to identify the expectations of the stakeholders in relation to the work of the CSN and to define actions for progress to be made in transparency, independence and credibility, in keeping with the contents of the Strategic Plan for 2011-2016.

For full information on the activities of the Advisory Committee, refer to the CSN website ([www.csn.es](http://www.csn.es)).

## 2. Monitoring and control of facilities and activities

### 2.1. Nuclear power plants

#### 2.1.1. Operation

During 2012 the six nuclear power plants (eight reactors) indicated in table 2 were in operation.

The overall evaluation of the operation of the nuclear power plants is accomplished considering fundamentally the results of the

Integrated Plant Supervision System (SISC), reported events, especially those classified on the IAEA's International Nuclear and Radiological Events Scale (INES Scale) with a level higher than zero, radiological impact, radiation doses received by the workers, the relevant modifications proposed, warnings and sanctions and operating incidents.

#### Integrated Plant Supervision System (SISC)

The SISC is currently the fundamental instrument used to evaluate the performance of the plants from the point of view of safety, the planning of the CSN's supervision and control efforts and public communication in both areas.

**Table 2. General information on the nuclear power plants and their operation in 2012**

	<b>Almaraz I</b>	<b>Almaraz II</b>	<b>Ascó I</b>	<b>Ascó II</b>	<b>Vandellós II</b>	<b>Trillo</b>	<b>Garoña</b>	<b>Cofrentes</b>
Type	PWR	PWR	PWR	PWR	PWR	PWR	BWR	BWR
Owner	Endesa Generación, Iberdrola Generación y Gas Natural SDG	Endesa Generación	Endesa Generación	Endesa Generación, Iberdrola Generación	Endesa Generación, Iberdrola Generación	Endesa Generación, Iberdrola Generación y Gas Natural SDG	Nuclenor	Iberdrola Generación
Thermal power (MW)	2,947	2,947	2,940.6	2,940.6	2,940.6	3,010	1,381	3,237
Electrical output (MW)	1,045	1,045	1,032.5	1,027.2	1,087.1	1,066	465.6	1,104
Authorisation for start-up	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 permit	07-06-10	07-06-10	02-10-11	02-10-11	21-07-10	16-11-04	05-07-09	20-03-01
Validity (years)	10	10	10	10	10	10	Through 06-07-13	10
Refuelling outage	10-11-12 to 10-01-13	06-05-12 to 16-06-12	27-10-12 to 11-12-12	12-11-11 to 13-01-12	26-05-12 to 10-07-12	19-05-12 to 17-06-12	No	No
Operation factor %	84.30	88.00	87.28	94.80	86.54	91.81	95.05	98.89
Load factor %	82.96	86.98	85.33	91.05	84.22	90.58	94.78	97.75
SISC indicators > green	-	-	3 whites	-	-	-	-	-
SISC findings > green	1 white	1 white	1 white	1 white	-	1 white	-	-
Event INES level > 0 <sup>(1)</sup>	-	-	1 level 1	1 level 1	1 level 1	-	-	-

(1) Events reported by the nuclear power plants in 2012 classified by the CSN on the INES Scale above level 0. PWR: Pressurised water reactor plant; BWR: boiling water reactor plant; MW: Megawatts.



In 2012 the Spanish nuclear fleet overall was in the basic normal situation for 65% of the time, with the application of standard inspection and control programmes, the situation known as *licensee response* in the SISC action matrix. For almost 35% of the time special regulatory attention was required from the CSN within the framework contemplated by the system, with preferential dedication to the two groups of the Ascó plant, which have remained throughout the year in the *regulatory response* column, including one quarter in which Ascó I was in the *degraded pillar* situation.

The CSN website has a specific link to the SISC ([www.csn.es/sisc/index.do](http://www.csn.es/sisc/index.do)), which includes the results of the system and supporting operational information, updated quarterly for all the nuclear power plants, plus descriptive system documentation and corresponding governing procedures.

During this year, the following indicators exceeded the classification *green*:

- *White* indicator at Ascó I nuclear power plant during the first and second quarters (operational

index of the emergency diesel generators), which has been white since the fourth quarter of 2009.

- *White* indicator at Ascó I nuclear power plant (operational index of the auxiliary feedwater system), which entered the white band during the third quarter.

During the year the following inspection findings exceeded the classification *green*:

- *White* findings during the first quarter at the two groups of the Ascó plant (emergency preparedness pillar) due to failures in the interpretation of meteorological tower indications.
- *White* findings during the fourth quarter at the two groups of the Almaraz plant and at Trillo (mitigation systems safety pillar) due to failures in spares management and qualification.

The aforementioned results and the findings and indicators accumulated during 2011 and 2012 that the SISC takes into consideration make up the action matrix for 2012, shown in table 3.

**Table 3. Action matrix of the Integrated Plant Supervision System (SISC) in 2012**

	1 <sup>st</sup> quarter	2 <sup>nd</sup> quarter	3 <sup>rd</sup> quarter	4 <sup>th</sup> quarter
Almaraz I	-	-	-	Regulatory response
Almaraz II	-	-	-	Regulatory response
Ascó I	Degraded pillar	Regulatory response	Regulatory response	Regulatory response
Ascó II	Regulatory response	Regulatory response	Regulatory response	Regulatory response
Vandellós II	-	-	-	-
Trillo	-	-	-	Regulatory response
Garofía	-	-	-	-
Cofrentes	-	-	-	-

(-) *Licensee response*.

The following figure summarises the results of detailed information on each of the operating the SISC during the period 2008-2012, with reactors.

**Figure 1. Results of the Integrated Nuclear Power Plant Supervision System (SISC) 2008-2012**

Almaraz I nuclear power plant																				
2008				2009				2010				2011				2012				
	T1	T2	T3	T4	T1	T2	T3	T4	T1	T2	T3	T4	T1	T2	T3	T4	T1	T2	T3	T4
MD																				
PD																				
RR																				
RT																				

  

Almaraz II nuclear power plant																				
2008				2009				2010				2011				2012				
	T1	T2	T3	T4	T1	T2	T3	T4	T1	T2	T3	T4	T1	T2	T3	T4	T1	T2	T3	T4
MD																				
PD																				
RR																				
RT																				

  

Ascó I nuclear power plant																				
2008				2009				2010				2011				2012				
	T1	T2	T3	T4	T1	T2	T3	T4	T1	T2	T3	T4	T1	T2	T3	T4	T1	T2	T3	T4
MD																				
PD																				
RR																				
RT																				

  

Ascó II nuclear power plant																				
2008				2009				2010				2011				2012				
	T1	T2	T3	T4	T1	T2	T3	T4	T1	T2	T3	T4	T1	T2	T3	T4	T1	T2	T3	T4
MD																				
PD																				
RR																				
RT																				

  

Vandellós II nuclear power plant																				
2008				2009				2010				2011				2012				
	T1	T2	T3	T4	T1	T2	T3	T4	T1	T2	T3	T4	T1	T2	T3	T4	T1	T2	T3	T4
MD																				
PD																				
RR																				
RT																				

  

Trillo nuclear power plant																				
2008				2009				2010				2011				2012				
	T1	T2	T3	T4	T1	T2	T3	T4	T1	T2	T3	T4	T1	T2	T3	T4	T1	T2	T3	T4
MD																				
PD																				
RR																				
RT																				

  

Santa María de Garoña nuclear power plant																				
2008				2009				2010				2011				2012				
	T1	T2	T3	T4	T1	T2	T3	T4	T1	T2	T3	T4	T1	T2	T3	T4	T1	T2	T3	T4
MD																				
PD																				
RR																				
RT																				

  

Cofrentes nuclear power plant																				
2008				2009				2010				2011				2012				
	T1	T2	T3	T4	T1	T2	T3	T4	T1	T2	T3	T4	T1	T2	T3	T4	T1	T2	T3	T4
MD																				
PD																				
RR																				
RT																				

Situation of the action matrix: RT: licensee response. RR: regulatory response. PD: degraded pillar. MD: multiple degradations. T1/2/3/4: quarters 1, 2, 3 or 4.

The pilot period having come to an end, the year 2012 has seen the official incorporation in the SISC of the security pillar. As in the case of the rest of the pillars, the meetings, committees and supplementary inspections contemplated by the system have been held and performed, the only difference being that the confidential nature of the question has meant that no detailed information on either the findings or the corrective actions has been made public.

Furthermore, during 2012 the necessary procedures and the required training to both the CSN inspectors and the personnel of the plants for the implementation of the new transversal components of the SISC that will supervise the different aspects of the safety culture of the different plants have been completed. Final implementation is expected during the first quarter of 2013.

Consequently, in view of the results of the SISC, it may be stated that during 2012 the Spanish nuclear fleet has performed correctly from the point of view of safety.

### Reportable events

Throughout 2012, the licensees of the nuclear power plants reported a total 49 events, 46 of which were classified as level 0 on the INES Scale and three as level 1. These three level 1 events were as follows:

- Ascó I nuclear power plant: error in the actuation logic of the safety injection and main steam isolation systems, detected during a test performed during the refuelling outage.
- Ascó II nuclear power plant: when the actuation logic identified as erroneous in the previous point for Ascó I was checked, the error was found to exist also in group II.
- Vandellós II nuclear power plant: detection of the possibility of the failure of safety systems in the event of an earthquake due to certain of the instruments not being isolated.

### 2.1.2. Licensing

The Nuclear Safety Council issued 43 decisions regarding authorisations and nine favourable reports, most of them dealing with requests from the nuclear power plants for the revision of their official operating documents. Likewise, 17 Complementary Technical Instructions (CTI) were issued. In view of their relevance, the following are particularly noteworthy among the agreements adopted by the CSN in relation to licensing:

- Reporting on the Physical Protection Plans of all the plants except Almaraz, where this reporting was performed in 2011.
- Reporting on the new revisions of the Site Emergency Plans of all the plants, except Garoña.
- Favourable report on the new revisions of the Radioactive Waste and Spent Fuel Management Plans of Cofrentes and Vandellós II.
- Six CTI's were issued, one to each nuclear power plant, establishing the actions to be taken as a result of the stress tests performed in the wake of the Fukushima accident.
- Ascó I and II nuclear power plant: favourable report on transition to the NFPA 805 standard on protection against fires.
- Trillo nuclear power plant: CTI establishing the Conditioned Application Standards (CAS) to be reviewed for forthcoming renewal of the plant operating permit.
- Santa María de Garoña nuclear power plant: preliminary report on the partial rescission of the Ministerial Order of July 3<sup>rd</sup> 2009, establishing July 6<sup>th</sup> 2013 as the date for definitive shutdown of the plant.

- Santa María de Garoña nuclear power plant: issuing of two CTI's containing the conditions deriving from the periodic safety review and the conditioned application standards to be fulfilled in the event of the operating permit being renewed.
- Santa María de Garoña nuclear power plant: negative report on the request for extension to the term contemplated in the Ministerial Order of June 29<sup>th</sup> 2012 for requesting renewal of the operating permit.
- Santa María de Garoña nuclear power plant: CTI establishing the documentation to be submitted in order to obtain the declaration of definitive shutdown.

#### Personnel licences

As of December 31<sup>st</sup> 2012, the number of licensed workers at the nuclear power plants amounted to 329: 136 supervisors, 175 operators and 18 holders of the head of radiological protection service diploma.

In 2012, the CSN awarded five nuclear power plant supervisor licences, 12 operator licences and one radiological protection service head licence and renewed the licences of one supervisor and five operators.

### 2.1.3. Tracking and control

The CSN carries out the tracking and control of the nuclear power plants by exercising its inspection function and by supervising the performance of the different plant safety improvement programmes.

#### 2.1.3.1. Inspection

The number of inspections performed at the eight groups of the operating plants in 2012 amounted to 158. Of these, 117 corresponded to the Basic

Inspection Programme (BIP) contemplated in the Integrated Plant Supervision System (SISC). This has meant the performance of practically all the inspections scheduled in the Basic Inspection Programme for 2012.

The remaining 42 inspections include the supplementary inspections performed as a result of inspection indicators or findings in categories above *green*, reactive inspections in response to operating incidents, generic inspections performed as a result of the new standards and in-house and industry operating experience and inspections relating to licensing issues.

#### 2.1.3.2. Safety improvement plans and programmes

Briefly described below are the most important safety improvement programmes performed by the CSN during 2012. Among these, the most significant for its volume, depth and commitment is the one corresponding to the actions arising in the wake of the Fukushima accident.

#### Actions deriving from the Fukushima accident

The accident at the Fukushima Dai-ichi nuclear power plant in Japan, which occurred on March 11<sup>th</sup> 2011, was caused by a submarine earthquake that registered level 9 on the Richter scale, followed by a massive *tsunami* that battered the north-eastern coast of Japan. As a result of the flooding, both the power supply and numerous systems and structures were lost, leading to partial meltdown of the core and hydrogen explosions in the reactor buildings of groups 1, 2 and 3, with the subsequent release of a large amount of reactivity off site.

From the very first moment, the Spanish Nuclear Safety Council undertook exhaustive tracking of the accident and a firm commitment with the corresponding international bodies to study the

accident and define whatever nuclear power plant safety improvements might be deduced as a result.

During 2011, in keeping with the initiative launched by the Council of the European Union, in agreement with the European Nuclear Safety Regulators Group (ENSREG) and with technical support from the Western European Nuclear Regulators Association (WENRA), so-called *stress tests* were performed at the European nuclear power plants with a view to assessing their safety margins beyond the design basis and, where appropriate, identify improvements in the light of the Fukushima accident.

The *Final report on the stress tests performed at the Spanish nuclear power plants*, approved by the CSN on December 21<sup>st</sup> 2011, verifies that the plants fully satisfy their design bases and have sufficient safety margins with respect to them and sets out a series of improvements that it is proposed will be implemented gradually, with an overall limit date set for the end of 2016. On March 15<sup>th</sup> 2012, these improvements were embodied by the CSN in Complementary Technical Instructions sent specifically to each plant. The most relevant aspects included in these CTI's are as follows:

- Increased seismic resistance of safety-significant equipment and structures.
- Implementation of new fixed and portable equipment in order to increase the extended response capacity of the plants to prolonged losses of power supply.
- Start-up of an Alternative Emergency Management Centre (AEMC) at each site.
- Start-up of a national Emergency Support Centre (ESC) with specialist equipment and personnel capable of intervening at any plant within 24 hours.

- Improvements to emergency communication systems.
- Improved alternative capacity to inject water into the reactor coolant system and reactor cavity.
- Implementation of a filtered primary containment venting system.
- Implementation of passive hydrogen recombiners in containments.
- Increased capacity to respond to accidents involving spent fuel pools.
- Improvements to the environmental Radioactivity Alert Network in order to allow for the automatic reception of data in all plant situations.

The European nuclear power plant stress tests programme has included a process of international review of the results obtained by each country, including *in situ* inspections carried out by teams of international experts. Likewise, within ENSREG it was agreed that each country should draw up a National Action Plan; in the case of Spain this Plan was approved by the CSN on December 19<sup>th</sup> and subsequently submitted to ENSREG and published on the website.

In addition, and in relation to potential extreme accident situations deriving from malicious human activity, the CSN issued CTI's on July 1<sup>st</sup> 2011, complemented by others on July 27<sup>th</sup> 2012, requiring all the plants to analyse adequate resources to provide the facilities with the following:

- Capacity to fight major fires beyond the plant design basis.

- Capacity to mitigate potential damage to the fuel (both in the reactor core and in spent fuel storage facilities).
- Actions to limit or control radioactive emissions in the form of liquid or gaseous releases.

### Generic issues

A generic issue is understood to be any safety problem identified at any national or overseas nuclear power plant that might affect other such plants. The CSN undertakes the tracking of these issues and promotes analysis of their applicability to the Spanish plants, along with the adoption of the corrective actions deriving from such analysis.

The most relevant generic issues in 2012 have been the following:

- *Lack of anti-siphon orifices in the spent fuel pool cooling system*

This issue derived from an event that occurred at the Cattenom plant in France, classified on level 2 on the INES Scale. It was discovered that the spent fuel cooling system discharge line did not have any orifice preventing the siphon effect, a fact that under certain circumstances might cause draining of the pool, leaving the spent fuel assemblies uncovered. The CSN sent a technical instruction to all the plants to prevent the existence of this defect.

- *Seismic considerations*

This issue relates to NRC Information Notice (IN) 2012-01 on seismic considerations. This IN identifies problems deriving from the instability of tanks not designed as safety class in the event of an earthquake. Specifically, if left full, the stand-by liquid control system test tanks might drop onto safety-related equipment and leave it inoperable; likewise, the alignment of the refuelling water storage tank, which is

safety-related, with a system not relating to safety, such as the pool cleanup system, might leave the first inoperable. The CSN issued a generic letter requesting all the Spanish nuclear power plants to analyse the applicability of this IN.

### Human and organisational factors

Since 1999, all the Spanish nuclear power plants have had safety assessment and improvement programmes relating to organisation and human factors. These programmes are aimed at implementing mechanisms for the supervision of human behaviour and tools for the prevention of human error, at establishing the influence of human factors on design modifications, at assimilating operating experience and at defining safety culture assessment and improvement processes, as well as verifying the effectiveness of the improvement plans.

During 2012, these programmes were inspected at the Almaraz, Trillo, Ascó and Vandellós II nuclear power plants.

### ANAV Procura Plan

The year 2012 saw the continuation of the special supervision programme set up by the CSN for the tracking of the Organisational, Cultural and Technical Reinforcement Plan (Procura) of the Ascó-Vandellós II A.I.E. Nuclear Association (ANAV), deriving from the radioactive particle release event that occurred at the Ascó plant in 2008.

Within the framework of this plan, Ascó replaced the fuel building ventilation system ducts that it has not been possible to disassemble and decontaminate, the corresponding functional tests being performed in 2012. In July 2012, the CSN carried out an inspection to check all aspects relating to the radiological status of this system.

By December 2012, all the 59 milestones that made up the first five lines, SMART (Specific, Measurable, Agreed, Realistic and Timely) lines, and the sixth line of the Cultural and Behavioural Reinforcement (CBR) Programme had been completed, and the five milestones belonging to the phase of verification of the effectiveness of the plan remained to be finished, this being expected by June 30<sup>th</sup> 2013.

Throughout 2012, the CSN has performed three inspections relating to different aspects of the Procura plan.

#### Nuclear power plant action plans for the period 2010-2016

In response to a request by the CSN, the nuclear power plant licensees updated the reports and forecasts presented the previous year during the first quarter of 2012, adapting them to the period 2012-2016. These reports contain the improvement plans and investments foreseen to maintain and strengthen safety aspects, including technology updating, maintenance of the installation, organisational improvements, personnel training, the analysis of operating experience, the renewal of equipment and staffing issues.

#### 2.1.4. Sanctions and warnings

The CSN issued proposals to the Ministry of Industry, Energy and Tourism regarding the opening of two sanctions proceedings against nuclear power plants:

- Almaraz nuclear power plant, due to a minor infringement consisting of non-compliance with the Radiological Protection Manual by leaving open the door of the calibration laboratory irradiation room with a source outside its shielding.
- Trillo nuclear power plant, due to an infringement classified as minor and consisting

of installing components without attention to the required qualification, thereby failing to comply with the Quality Assurance Manual and CSN Instruction IS-19.

Likewise, four warnings were issued by the CSN to nuclear power plants during 2012:

- Ascó nuclear power plant: for non-compliance with CSN Instruction IS-10 regarding criteria for the reporting of events at nuclear power plants, failing to report on a non-scheduled start-up of the emergency ventilation of the auxiliary building of group I.
- Cofrentes nuclear power plant: for non-compliance with CSN Instruction IS-12 regarding non-licensed personnel qualification and training requirements.
- Cofrentes nuclear power plant: for non-compliance with CSN Instruction IS-21 regarding plant modifications, consisting of using fuel pool racks not included within the scope of an authorised modification.
- Cofrentes nuclear power plant: for non-compliance with CSN Instruction IS-10 regarding criteria for the reporting of events at nuclear power plants, exceeding the period for notification of a minor fire.

#### 2.1.5. Conclusions

In view of the evaluation of the results of the Integrated Plant Supervision System (SISC), along with the consideration of different plant performance aspects, as set out above and in accordance with the references to radiological impact, it may be stated that throughout 2012 the Spanish nuclear power plants have operated correctly, within the established safety limits and without situations of undue risk.

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

This section covers the Juzbado fuel assembly manufacturing facility, the El Cabril waste disposal centre and the Centre for Energy-Related, Environmental and Technological Research (Ciemat), all of them operated within the established safety margins and without situations of undue risk.

### Licensing

Throughout the year the CSN reported on eight requests for authorisation, reaching favourable conclusions on seven of these and rejecting one. The proceedings reported on referred to the following:

- Juzbado fuel assembly manufacturing facility. Authorisation for modifications to the environmental activity measuring system and fire-fighting system, with the corresponding changes to the Operating Technical Specifications and Final Safety Analysis Report. Approval of the plant Physical Protection Plan. A request for modification of the facility's operating permit in relation to the communications required for the transport of fissile substances was rejected.
- El Cabril waste disposal centre. Authorisation of new revisions of the following official operating documents: Operating Regulation, Site Emergency Plan, Physical Protection Plan and Waste Management Plan.
- Ciemat. Authorisation for operation of radioactive installation IR-33, the neutron standards laboratory.

### Personnel licences

As of December 31<sup>st</sup> 2012, the number of licensed workers at these facilities amounted to 185: 71 supervisors, 107 operators and seven holders of the head of radiological protection service diploma.

In 2012, 12 supervisor licences and 13 operator licences were issued and licence extensions were granted for eight supervisors and five operators.

### Inspection and control

In performing its respective control programmes, the CSN carried out 34 inspections in total: 16 at the Juzbado fuel assembly manufacturing facility, 11 at the El Cabril disposal centre and seven at Ciemat.

### Reportable events

There were two reportable events at the Juzbado fuel assembly manufacturing facility, neither of which implied any risk for the workers, the public or the environment.

At El Cabril there were three notifications regarding water collected in the leachate collection network of very low level waste disposal cell 29. These events occurred following heavy rainfall and did not imply any risk for the safety of the facility.

These events were classified on level 0 on the INES Scale.

### Sanctions and warnings

There were no sanctions or warnings during the year.

## 2.3. Facilities in definitive shutdown, dismantling and decommissioning phases

The following nuclear or fuel cycle radioactive facilities have now been definitively shut down or are in the process of dismantling and decommissioning: Vandellós I nuclear power plant (in the dormancy phase following completion of the first phase of dismantling), José Cabrera nuclear power plant (in the dismantling phase), the Elefante uranium concentrates plant (dismantled and in the period of surveillance), the Quercus plant (definitively shut down and pending the dismantling request), and the



Andújar uranium mill (FUA) (dismantled and in the compliance period).

At all these facilities the programmes for environmental radiological surveillance, the radiological protection of the workers, physical protection and, where appropriate, the control of effluent releases and waste management remain operative. There have been no deviations in the performance of any of these programmes.

The activities performed at each of the installations, depending on their respective conditions, have been carried out during 2012 within the established limits and without undue impact for persons or the environment.

#### Licensing

The CSN reached seven decisions and issued five favourable reports:

- José Cabrera nuclear power plant. Approval of new revisions of the following official operating documents: Operating Specifications, Operating Regulation, Site Emergency Plan and Physical Protection Plan. In addition, five favourable reports were issued in response to different proposals regarding design modifications and the use of buildings and the functional tests corresponding to these modifications.
- Vandellós I. Approval of a new revision of the Operating Regulation.
- Quercus Plant. Rejection of a new extension to the temporary suspension of the dismantling licensing process.
- FUA. Approval of a new revision of the Surveillance and Maintenance Plan.

#### Personnel licences

As of December 31<sup>st</sup> 2012, the number of licensed workers at these facilities amounted to 25: 10

supervisors, 10 operators and five holders of the head of radiological protection service diploma.

In 2012 the CSN awarded a new operator licence for installations in the dismantling phase.

#### Inspection and control

In the performance of the respective control programmes of the facilities, the CSN performed a total 20 inspections: two at the Vandellós I plant, 13 at José Cabrera, two at the Quercus plant and three at the Andújar uranium mill (FUA).

## 2.4. Radioactive facilities

The operation of the scientific, medical, agricultural, commercial and industrial radioactive facilities took place throughout 2012 within the scope of the safety regulation established, in compliance with the measures required for the radiological protection of people and the environment.

#### Licensing

The licensing of these facilities is performed by the CSN with the collaboration of the autonomous communities with which there are entrustment agreements including the function of evaluating requests for authorisation.

A total 364 reports referring to radioactive facilities were issued, 248 of which were performed by the CSN and the remaining 116 by the aforementioned autonomous communities. Their distribution by types was as follows:

- 61 for operating authorisations.
- 51 for decommissioning declarations.
- 252 for the authorisation of different modifications.

#### Personnel licences

As of December 31<sup>st</sup> 2012, the number of licensed workers at radioactive facilities amounted to

13,321: 3,865 supervisor and 9,284 operator licence holders and 172 with the head of radiological protection service diploma.

The total number of persons accredited to manage or operate radiodiagnosis installations at the end of 2012 amounted to 109,071, of which 45,022 were accredited to manage such facilities and 64,049 to operate them.

The CSN awarded the following licences and accreditations throughout the year:

- For radioactive facilities: 461 new supervisor licences, 1,055 operator licences and 21 head of radiological protection service diplomas, as well as the extension of 436 supervisor licences and 972 operator licences.
- For medical radiodiagnosis facilities: 311 accreditations for the management of such facilities and 1,910 to operate them.

As regards courses to obtain licences and accreditations, the CSN homologated two new organisations for the delivery of courses for radioactive facilities and authorised the modification of seven previously homologated. Also homologated were three new courses for the accreditation of X-ray facility personnel, with a further 13 being modified.

The control of course delivery and of the corresponding examinations led to the performance of 68 inspections of courses relating to radioactive facilities and to three inspections of courses relating to the accreditation of medical radiodiagnosis facility personnel.

#### Inspection and control

The inspection of these installations is performed by the CSN in collaboration with the autonomous communities with which agreements for the entrustment of functions have been signed.

**Table 4. Evolution of the number of radioactive facilities**

Category	Field of application	2008	2009	2010	2011	2012
1 <sup>st</sup>	Irradiation	1	1	1	1	1
	<b>Subtotal</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>2</b>
2 <sup>nd</sup>	Commercialisation	53	53	58	57	58
	Research and education	89	102	98	102	97
	Industry	604	586	570	563	558
	Medicine	315	320	322	326	322
	<b>Subtotal</b>	<b>1,061</b>	<b>1,061</b>	<b>1,048</b>	<b>1,048</b>	<b>1,035</b>
3 <sup>rd</sup>	Commercialisation	15	17	16	14	14
	Research and education	95	94	97	90	89
	Industry	156	165	182	195	207
	Medicine	51	49	46	42	38
	<b>Subtotal</b>	<b>317</b>	<b>325</b>	<b>341</b>	<b>341</b>	<b>348</b>
	Medical X-rays	29,714	30,475	31,437	32,595	33,625
	<b>Total</b>	<b>31,093</b>	<b>31,862</b>	<b>32,827</b>	<b>33,985</b>	<b>35,010</b>

During 2012, 1,790 inspections were performed at radioactive facilities, 772 of which were undertaken by the CSN and the remaining 1,018 by the autonomous communities with entrustment agreements. The distribution by types was as follows:

- 1,487 control and licensing inspections at radioactive facilities.
- 290 control inspections at radiodiagnosis facilities.
- 13 inspections relating to incidents, complaints or irregularities.

The control performed by the CSN is based also on the review of periodic reports. In this respect, 1,198 annual reports were received from radioactive facilities, around 5,000 reports from diagnostic X-ray installations and 264 quarterly commercialisation reports.

The results of these inspections, along with the analysis of the annual reports from the facilities, of the information on radioactive materials and equipment supplied by the commercialisation installations and of the waste management data provided by Enresa, gave rise to the remittal of 331 control letters.

Also noteworthy among the control activities has been the response to complaints, of which there were 18 in 2012, giving rise to 13 inspection visits. In all cases appropriate measures were taken and the persons issuing the complaints were informed of the result of the control actions.

### Reportable events

Six events were reported at radioactive facilities, one at an industrial installation and the remaining five at medical facilities. As regards the causes, four were attributable to operational failures and two to equipment failures.

### Sanctions and warnings

The CSN proposed the initiation of a single sanctions proceeding to the competent authority, for non-compliance with the technical requirements imposed on a radioactive facility.

Likewise, as a result of assessment activities and control inspections at the facilities, 59 warnings were issued, including the identification of the deviations encountered and the requirement that they be corrected in the short term. One radioactive facility was fined for not performing in time the corrective actions required in the warning issued to it.

### Relevant issues

As part of its function the CSN has continued to provide the licensees of radioactive facilities with circulars and complementary technical instructions clarifying and interpreting standards and disseminating good practices. In 2012 two informative circulars were distributed, dealing with the following:

- An informative circular to companies commercialising radioactive materials on issues of interest relating to the transport of radioactive material.
- An informative circular to all authorised mobile gammagraphy radioactive facilities notifying them of the conclusions of the dose analysis performed in the sector by the CSN.

During 2012 the action plan for the application of the INES Scale in the classification of events at radioactive facilities in Spain has been completed and the informative leaflet on the updated INES Scale and the new complete INES Application Manual in Spanish have been included in the CSN website.

Work has also continued on the management of the national inventory of high level sealed

radioactive sources, as required by Royal Decree 229/2006 on the control of high level sealed radioactive sources and orphan sources.

In the industrial and research fields, mention may be made of the incorporation of three particularly significant facilities: a new irradiator for the sterilisation of medical materials equipped with a 40 kW linear electron accelerator with a maximum energy of 10 MeV, a 444 TBq cobalt-60 irradiator for research into irradiated materials and a neutron standard laboratory, incorporated at Ciemat.

Of particular significance in the medical field is the widespread implementation of cyclotrons for the synthesis of radiopharmaceutical products, with 19 authorised at the end of 2012, and the consequential proliferation of PET (positron emission tomography) diagnosis installations, with 87 authorised. Likewise, mention should be made of the progressive replacement of cobalt therapy equipment with linear accelerators, as is underlined by the existence of 259 of the latter compared to the 16 remaining cobalt therapy units.

## 2.5. Service companies

This area includes those companies or entities that are subject to nuclear regulation and render services to third parties in relation to radiological protection. It includes the radiological protection services (SPR), radiological protection technical units (UTPR), companies selling and providing technical assistance for medical X-ray equipment, personal dosimetry services and registered external companies.

The following activities may be singled out:

- In relation to radiological protection services and units:

- The CSN authorised one new SPR, the modification of three previously awarded SPR and four UTPR authorisations and the decommissioning of one UTPR. As of the closure of 2012, there were 82 SPR's and 46 UTPR's authorised.

- 20 inspections were performed at SPR's and 19 at UTPR's. Of these, six and two respectively were carried out with the collaboration of the autonomous communities with which agreements for the entrustment of functions have been signed.

- During 2012 the tests required for the awarding of diplomas to 21 heads of radiological protection were performed.

- Within the framework of collaboration between the CSN and the Spanish Radiological Protection Society, the activities of three working groups continued for the definition of the human and technical resources of the UTPR's, the development of a model of conformity relating to the installations certified and a type radiological protection programme applicable to dental clinics using intraoral imaging systems.

- As regards sales and technical assistance companies:

- The CSN reported on the authorisation of 12 new sales and technical assistance companies and the modification of another nine. With these authorisations and the closure of 12 of these companies registered by the competent authorities of the autonomous communities, the number of authorised sales and technical assistance companies stood at 314 at the end of 2012.

- The control of these companies is accomplished by examination of their annual reports and comparison of the latter with

other information and records, with inspection required only in exceptional cases. In 2012, 260 annual reports were reviewed and only one inspection was performed.

- As regards dosimetry services:
  - The modification of the authorisations for four external personal dosimetry services was authorised, as a result of which as of the closure of 2012 there were 20 external dosimetry services and nine internal dosimetry services authorised by the CSN.
  - Nine control inspections were carried out, seven at external dosimetry services and two at internal dosimetry services.
- As regards external registered companies:
  - Throughout the year there were 123 entries on the Register of External Companies, the vast majority referring to companies carrying out activities in relation to nuclear power plants. The scope of the inspections performed at plants performing refuelling outages includes checking of the obligations affecting these companies.

## 2.6. Transport of nuclear and radioactive materials

In 2012 the CSN reported on 16 issues in the field of licensing of transport activities

- Three reports on the validation of certificates of approval for packages coming from overseas and revision of the certificate of approval for a package of Spanish origin.
- One report on special authorisations for the transport of disused cobalt therapy headers to the Enresa radioactive waste disposal facility at El Cabril (Córdoba).

- Six authorisations regarding physical protection in the transport of nuclear materials and the entry of a company on the register of companies performing radioactive material transport operations requiring physical protection measures.
- Three reports have been issued authorising radioactive waste transfers in accordance with Royal Decree 243/2009 on the surveillance and control of radioactive waste and fuel transport operations, and one for the reduction of nuclear civil liability coverage in a nuclear substances transport operation.

Throughout the year 69 inspections were performed in relation to the transport of nuclear and radioactive materials, 23 by the CSN and the remaining 46 by autonomous communities with entrustment agreements.

This control is completed with an analysis of the previous notifications and performance reports required by the CSN for the transport of fissile materials, high level radioactive sources and wastes. Throughout the year 74 shipments of fissile materials were analysed, along with 278 shipments of radioactive wastes to the El Cabril facility performed by Enresa, 222 from nuclear facilities and 56 from other installations.

During 2012 there was one single reportable event in the transport of radioactive material, consisting of a road accident suffered by a vehicle that was transporting radioactive material for medical application. There was no damage and the packages were subsequently received by the addressees.

## 2.7. Other regulated activities

### Radioactive materials, equipment, apparatus and accessories

During 2012 the CSN issued two reports relating to the manufacturing of five models of radioactive

equipment, three for the inspection of packaged products, one for the inspection of unpackaged products and one for the inspection of packages, all equipped with X-ray generators.

Likewise, in 2012 the CSN issued 23 favourable reports for the type approval of 40 models of radioactive apparatus, all incorporating X-ray generators. In keeping with the Regulation on Nuclear and Radioactive Facilities, type approval implies exemption from consideration as a radioactive facility due to the intrinsic safety of the facility.

As regards the commercialisation and technical assistance activities regulated in article 74 of the Regulation on Nuclear and Radioactive Facilities, in 2012 the CSN issued reports on three new authorisations, the modification of 12 granted previously and the closing of three others. As of the end of the year, 58 companies held such authorisation.

#### Uranium ore resources

The CSN has issued an evaluation report on a request for an uranium ore resources prospecting permit in the provinces of Barcelona and Lleida, in response to a request by the Regional Government of Catalonia.

A report was issued on the modification of a second category radioactive facility for the analysis and management of ore samples, consisting of its transfer, and its new site was inspected.

In 2012 the Territorial Service for Industry, Trade and Tourism of the Regional Government of Castilla y León granted three permits for prospecting in the province of Salamanca, which had been reported on by the CSN in previous years.

In addition, the CSN received a total 16 reports on compliance with the radiological requirements imposed during mining prospecting work, 15 corresponding to the autonomous community of Castilla y León and one to Extremadura.

## 2.8. Activities and facilities not regulated by the nuclear legislation

### Transfers of radioactive material to Enresa

Throughout the year the CSN reported on 19 proceedings authorising the transfer to Enresa of different unauthorised materials and radioactive sources. In 16 of these cases the requesting party did not have a radioactive facility. Two of the proceedings were dealt with by autonomous communities with which agreements for the entrustment of functions have been signed.

### Removals of radioactive material detected in metallic materials

As of December 31<sup>st</sup> 2012, the number of metallic materials processing and management installations adhering to the *Protocol on collaboration in the radiological surveillance of metallic materials* amounted to 158

During 2012, the CSN was informed on 63 occasions of radioactivity detected in metallic materials, within the framework of the aforementioned protocol. The radioactive sources detected (indicators with radioluminescent paint, ion smoke detectors, radioactive lightning rods, pieces of uranium, products containing radium and thorium and parts with artificial contamination) were either transferred to Enresa for management as radioactive waste or are still pending the completion of their characterisation for such transfer.

## 3. Radiological protection of people and the environment

### 3.1. Radiological protection of workers

The number of workers professionally exposed to ionising radiations and dosimetrically controlled in Spain amounted to 105,605 in 2012, with an average individual dose of 0.74 mSv/year and a collective dose of 18,273 mSv.person. These data consider only significant doses and exclude cases of potential exceeding of the annual dose limit and administrative doses assigned due to dosimeters not being changed.

99.6% of the dosimetrically controlled workers received doses lower than 6 mSv/year and 99.98% received doses lower than 20 mSv/year.

This distribution underlines the positive trend of the doses at the country's nuclear and radioactive

facilities as regards compliance with the dose limits established by the regulations for professionally exposed workers (100 mSv over five years).

As of closure of the 2012 dosimetry year, there were a total 18,946,191 dosimetry measurements registered in the National Dosimetry Bank, corresponding to 316,502 workers and 58,474 installations.

Throughout 2012 the CSN distributed a total 5,479 radiological licences for the workers of 291 companies.

Analysis of the aforementioned data points to the following:

- The greatest contribution to the collective dose of the country's professionally exposed workers was by the medical radioactive facilities, with 63% of the overall collective dose. The number of professionally exposed workers in the sector represents 77% of the total.

**Table 5. Doses received by professionally exposed workers in 2012**

Facilities	Number of workers	Collective Doses (mSv.person)	Average individual dose (mSv/year)
Nuclear power plants	9,332	3,309	1.01
Fuel cycle, waste disposal and storage facilities and research centres (Ciemat)	1,124	87	0.54
Radioactive facilities			
Medical	81,615	11,529	0.63
Industrial	7,642	2,544	1.32
Research	5,881	342	0.32
Facilities in the dismantling and decommissioning phase	132	163	2.01
Transport	363	298	2.37

- The radioactive research facilities are those reflecting the lowest average individual dose value (0.32 mSv/year). As in previous years, the highest average individual dose was that of the transport workers (2.37 mSv/year), and concentrated on the transport of radiopharmaceutical products by road. The high level of activity of the shipments, the small size of the packages, their manual loading and unloading and the fact that the supply is undertaken by few companies and involves a small number of workers leave little margin for significant reduction of the dose, despite the special monitoring to which the sector is subjected by the CSN
- At the nuclear power plants the average individual dose amounted to 1.01 mSv/year, the contracted personnel showing the highest values (1.08 mSv/year), a situation analogous to that of other countries. The three-year evolution by reactor type shows the following results:

a) Pressurised water reactors

The average three-year collective dose per reactor (2010-2012) decreased with respect to last year (2009-2011), despite the fact that in 2012 five of the six groups of this type had refuelling outages. It was also lower than the average three-year collective dose of plants of this type in the USA and in Europe for the period 2009-2011.

b) Boiling water reactors

The value of the average three-year collective dose for BWR plants during the period 2010-2012 was lower than during the previous three-year period (2009-2011), since there were no refuelling outages at the Garoña and Cofrentes plants in either 2010 or 2012. This value has also been lower than the BWR plants overall in

Asia, Europe and the USA during the three-year period 2009-2011.

In 2012 there were three cases of the annual regulatory dose limits of the workers being exceeded, all at medical radioactive facilities, which have been investigated in accordance with the established procedure.

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

#### Control of effluents

During 2012 the liquid and gaseous radioactive releases from the facilities remained at the habitual values and are comparable to those of other European and American installations, as shown by the surveillance performed and the registers maintained. As in previous years, the calculated doses attributable to these releases were far below the regulatory dose limits for the public and represent a minor fraction of the release limits. In the specific case of the nuclear power plants, this fraction does not exceed 4% of the authorised limit (0.1 mSv in 12 consecutive months).

Table 6 shows a comparison between the activity of the radioactive effluents from the Spanish nuclear power plants and the UNSCEAR (United Nations Scientific Committee on the Effects of Atomic Radiation) average. In general the Spanish values are lower or of the same order of magnitude.

Table 7 includes information on the effluents from fuel cycle facilities and nuclear and fuel cycle facilities in the dismantling and decommissioning phases.

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

The processing and analysis of the samples taken as part of the environmental radiological surveillance programmes (PVRA) implemented in the vicinity of the nuclear and fuel cycle facilities and installations



in the definitive shutdown and dismantling phases imply a time lag of more than six months in obtaining results, for which reason this report refers to the data corresponding to the year 2011.

During that year, within the framework of the environmental radiological surveillance

programmes, 6,564 samples were taken around operating nuclear power plants, 2,130 in the vicinity of fuel cycle facilities and 2,038 at installations in the definitive shutdown and dismantling and decommissioning phase, including the José Cabrera and Vandellós I nuclear power plants.

**Table 6. Activity of radioactive effluents from nuclear power plants (GBq/GWh). Year 2012**

Gaseous radioactive effluents				
	PWR		BWR	
	Spain <sup>(1)</sup>	UNSCEAR 2008 <sup>(2)</sup>	Spain <sup>(1)</sup>	UNSCEAR 2008 <sup>(2)</sup>
Noble gases	7.17E-1	1.26E+0	2.68E+0	5.02E+0
Iodine-131	1.97E-6	3.42E-5	6.93E-5	6.85E-5
Particles	9.79E-7	3.42E-6	2.28E-4	5.59E-3
Tritium	1.51E-1	2.40E-1	1.77E-1	1.83E-1
Carbon-14	3.56E-2	2.51E-2	4.74E-2	6.05E-2
Liquid radioactive effluents				
	PWR		BWR	
	Spain <sup>(1)</sup>	UNSCEAR 2008 <sup>(2)</sup>	Spain <sup>(1)</sup>	UNSCEAR 2008 <sup>(2)</sup>
Total except tritium	6.04E-4	1.26E-3	4.30E-5	9.13E-4
Tritium	3.02E+0	2.28E+0	8.50E-2	2.05E-1

(1) Average values: 2003-2012, except carbon-14, which corresponds to the period 2007-2012. (2) Average values: 1998-2002. PWR: pressurised water reactor. BWR: boiling water reactor.

**Table 7. Fuel cycle facilities and facilities in shutdown, dismantling and decommissioning phases. Activity of liquid and gaseous effluents (Bq). Year 2012**

Effluents	Fuel cycle facilities			Facilities in shutdown and dismantling				
	Juzbado	El Cabril	Ciemat	Quercus	Vandellós I (2)	José Cabrera		
Liquid effluents	Total alpha	(1)	9.46E+05	1.16E+7	Fission/activation	–	2.91E+07	
	1.73E+07				Tritium	–	2.35E+10	
					Alpha		1.32E+05	
Gaseous effluents	Total alpha	Total alpha	2.87E+04	LDL	(3)	Particles	2.03E+03	5.02E+05
	8.45E+04	Total beta	1.03E+05			Tritium	LDL	4.27E+09
		Gamma	2.65E+04			Alpha	2.62E+01	<LDL
		Tritium	1.16E+09			C-14	6.09E+01	–
		C-14	1.53E+07					
Radiological impact calculated	<1% of limit authorised	4.9% of limit authorised				<1% of authorised limit		

(1) Zero release installation. (2) Emissions due to occasional venting of shroud and specific characterisation operations. (3) No gaseous effluents generated due to definitive shutdown. LDL: lower detection limit.

**Table 8. Environmental radiological surveillance programmes: number of samples taken at operating nuclear power plants in 2011**

Type of samples	Garoña	Almaraz	Ascó	Cofrentes	Vandellós II	Trillo
Atmosphere	758	786	849	760	835	773
Water	192	212	118	142	130	141
Total foodstuffs	163	282	121	95	87	120
<b>Total</b>	<b>1,113</b>	<b>1,280</b>	<b>1,088</b>	<b>997</b>	<b>1,052</b>	<b>1,034</b>

**Table 9. Environmental radiological surveillance programmes: number of samples taken at fuel cycle facilities and installations in the definitive shutdown, dismantling and decommissioning phases in 2011**

Facility	Juzbado	Cabril	Ciemat	Quercus/Elefante	José Cabrera	Vandellós I	FUA	LoboG
No. of samples	600	780	750	790	768	350	60	70

The results of the 2010 PVRA's are similar to those of previous years and, from the radiological point of view, show an adequate environmental quality around the facilities. Nevertheless, and as occurred in our neighbouring countries, as from March 23<sup>rd</sup>-24<sup>th</sup> 2011, and for a short period of time, radioactive contamination from the accident at Fukushima nuclear power plant was detected, mainly as a result of iodine-131, cesium-134 and cesium-137 in the air, milk, vegetables, rainwater and soil. The measures were very low and in all cases below the "maximum tolerances for foodstuffs" imposed by the European Union on the importing of foodstuffs and animal feed from Japan.

In order to verify that the surveillance programmes performed by the facilities are correct, the CSN carries out independent environmental radiological surveillance programmes (PVRAIN), the sample volume and determinations of which represent 5% of those performed by the licensees. In 2012 they were carried out by six university environmental radioactivity laboratories contracted by the CSN and by four contracted by the autonomous communities with this function assigned for the installations in their territory, two in Catalonia and two in Valencia. The results of the

CSN's independent programmes did not show any significant deviations with respect to those obtained by the licensees.

Within the framework of article 35 of the Euratom Treaty, which establishes the obligation of the member States to control environmental radioactivity, the European Union makes verification visits to examine the installations, resources and procedures used by the States for this surveillance. From September 23<sup>rd</sup> to 28<sup>th</sup> 2012, an EU team carried out a verification visit relating to the disused Spanish uranium concentrates plants (Elefante, Quercus and FUA) and certain restored uranium mines (La Virgen, Valdemascaño and Saelices el Chico).

In its preliminary conclusions (the final report has yet to be published), the team describes the environmental radiological surveillance established at all the sites visited as being adequate, underlines the good level of equipment of the laboratories and the competence and qualification of the personnel and declares that Spain is in full compliance with the obligations set out in article 35 of the Euratom Treaty.

## Radiological surveillance of the national territory

The CSN also controlled the environmental radiological quality of the national territory through the following

- The network of automatic stations (REA), made up of the CSN's network with 25 stations distributed throughout the country, and the networks of the communities of Catalonia, Valencia, Extremadura and the Basque Country, which provide a further 18 stations located in their respective territories. The objective is the continuous measurement of gamma dose rate, radon concentration, radioiodines and alpha and beta emitters in the air.
- The network of sampling stations (REM), made up of a total 20 laboratories that analyse samples of river and coastal waters, the atmosphere, the terrestrial medium and foodstuffs. This network operates in two modes: the so-called dense network, which analyses a large number of samples from numerous locations throughout the territory, and the open or spaced network, which deals with few samples but with a high degree of accuracy.

The values obtained during 2012 are similar to those of previous years and show the correct radiological status of the national territory. The impact of the accident at the Fukushima plant, which has already been commented on in the section on surveillance in the vicinity of nuclear facilities, was the subject of special tracking and the results obtained were analogous to those of the facilities' ERSP's.

## Procedural intercomparison and standardisation campaigns

In order to guarantee the homogeneity and reliability of the results obtained in the different environmental radiological surveillance programmes, and in view of the fact that a number of

laboratories participate in their performance, the CSN carries out periodic intercomparison exercises with these laboratories and promotes working groups for the standardisation of environmental radioactivity sampling and measurement procedures.

In 2011-2012 an intercomparison campaign was carried out for the measurement of radioactivity in water. Forty-four laboratories belonging to different public organisations, universities and companies participated and in view of the results obtained it may be concluded that the participating laboratories present a satisfactory level of quality.

## Specific surveillance programmes

### *Surveillance on the site of the former Lobo-G Plant*

Following the decommissioning in August 2004 of the Lobo-G uranium concentrates plant, what now remains on the site is a fenced and signposted enclosure subject to institutional surveillance, temporarily in the charge of Enusa as the former operator of the facility.

During the environmental radiological surveillance programme performed by the facility in 2011, approximately 70 samples were taken and some 250 analyses were carried out, these not showing any significant radiological impact for the public.

In 2012 the CSN verified compliance with the conditions of the decommissioning declaration and the performance of the surveillance programme by means of an inspection.

### *Radiological surveillance in the Palomares area*

The Ciemat has continued the performance of a radiological surveillance programme relating to the military aviation accident that occurred in 1966, which involved the dispersion of plutonium. The objective of the programme is the detection and monitoring of possible internal contamination

affecting people and the measurement and analysis of the evolution of residual contamination in the soil.

The results of the surveillance programme performed on people indicate that the accident has had no impact on the health of those residing in the Palomares area.

Following favourable reporting by the CSN in 2010 on the preliminary proposal for a Rehabilitation Plan for the area submitted by Ciemat, the Spanish and United States authorities held several meetings throughout 2010 and 2011 on possible collaboration by the US in undertaking the said Plan. There have been no novelties in 2012 regarding this matter.

### 3.3. Protection against natural radiation sources

Within the new legal framework established by modification of title VII of the Regulation on the Protection of Health against Ionising Radiations of Royal Decree 1439/2010, which imposes on the licensees of activities involving natural radiation sources the study of their radiological impact and the declaration of such activities for entry on a register, throughout 2012 the CSN has continued its standards development, publishing Instruction IS-33 on *radiological criteria for protection against exposure to natural radiation* and Safety Guide 11.2 *Control of exposure to natural radiation sources*.

As regards the pilot projects promoted by the CSN to determine the radiological impact of certain activities and industries, 2012 saw the completion of the *Study on radiological risk in arc welding*, a joint project carried out by the universities of the Basque Country and Zaragoza.

The CSN continues its reporting, control and advisory tasks in relation to the following activities in the area of protection against natural radiation sources:

- Elimination of phosphogypsum residues in the Flix reservoir in Tarragona.
- Recovery of land contaminated by phosphogypsums in the Hondón area in Cartagena.
- Management of contaminated waste generated in operation of the Casablanca platform off the coast of Tarragona.
- Restoration of the phosphogypsum pools generated by Fertiberia in the Huelva marshes.
- Assessment of the radiological risk associated with the exploitation of the Castañar de Ibor cave in Cáceres for tourism purposes.
- Assessment of the radiological risk associated with the exploitation of the Pozalagua cave in Vizcaya for tourism purposes.

### 3.4. Protection of patients

Within the framework of the agreement signed between the Nuclear Safety Council and the Ministry of Public Health in 2010, the CSN continues to participate in joint activities in the field of the radiological protection of patients subjected to treatment using radiations. During 2012, this collaboration has materialised in the performance of the following projects:

- Dopes project: estimation of population doses in Spain from medical radiodiagnosis procedures. This project is being undertaken with the University of Malaga
- Domnes project: estimation of population doses in Spain from nuclear medicine procedures. This project is being carried out within the framework of the Permanent Forum on Radiological Protection in the Medical Environment.

- Marr project: application of the risk matrixes methodology in radiotherapy services. Like the one described above, this project is being carried out within the framework of the Permanent Forum on Radiological Protection in the Medical Environment.
- Study of the effects of medical diagnostic exposure in children and adolescents, a project performed jointly with the Centre for Environmental Epidemiological Research.

### 3.5. Emergencies and physical protection

#### 3.5.1. Emergencies

##### Participation in the National Emergencies System

The CSN's most relevant activities in 2012 have been the following:

##### *Institutional collaboration:*

- Setting up of a joint working group with the Directorate General for Civil Defence for the revision of the Basic Nuclear Emergency Plan (Plaben) in the light of the lessons learned from the Fukushima accident.
- Start-up of an emergency response room (Salem 2) in support of the CSN's facility, located at the general headquarters of the Military Emergency Response Unit (UME) in Torrejón de Ardoz (Madrid).
- Incorporation of the CSN in the National Emergencies Network (Renem) of the Ministry of Defence for the coordinated management of national emergencies.
- Signing of six collaboration agreements between the CSN and the autonomous communities of Valencia, Navarre, Galicia, Madrid, the Basque Country and Castilla-La Mancha in relation to radiological emergency preparedness, planning and response.

##### *Training of persons intervening in emergencies and other specialities:*

- Design of a course, in collaboration with Ciemat, on "Supervision of nuclear and radiological emergency intervention teams" for the UME Technological Risks Unit (GIETMA).
- Organisation and delivery of the sixth edition of the "General initial and on-going training course for persons intervening in nuclear emergencies", in collaboration with the National Civil Defence College.
- Collaboration in the delivery of training courses for the members of municipal organisations intervening in the Penca, Pengua, Penta and Penva plans and for the training of the members of the public safety and law and order group of the Penbu and Penca plans.
- Drills were organised and carried out for the activation of the classification and decontamination centres (ECD) at Brihuega and Ayora, within the framework of the Pengua and Penva plans, respectively.
- Organisation and financing of a course on radiological emergencies at the Public Safety Institute of Catalonia, aimed at different members of the technical staff of the Catalonian Regional Government.
- Participation in various courses for specialists in NBQ (nuclear, bacteriological and chemical) defence of the Ministry of Defence, the Directorate General of the Guardia Civil, the National Police Force and the Police Force of the Basque Country.

##### *Exercises and drills:*

- In 2012 all the nuclear power plants and facilities carried out emergency drills within the

framework of their respective Site Emergency Plans, under the supervision of the CSN.

- Participation in the Gamma 2012 exercise organised by the UME in the area of Cogolludo (Guadalajara), with on the spot assessment and management of a simulated accident involving a vehicle transporting radioactive material.
- Participation in three international emergency drills, ConvEx-1b, ConvEx-2b and ConvEx-2a, organised by the International Atomic Energy Agency (IAEA).
- The CSN also intervened in four international exercises, three level 1 Ecurie exercises and one level 3 Ecurie exercise, organised by the European Union.
- The CSN participated as an observer in the large-scale Pegase 2012 exercise, performed by the Belgian authorities at group III of Tihange nuclear power plant.

#### *Operation and resources:*

- The CSN's Emergency Response Organisation (ERO) guarantees the staffing of the Emergency Response Room (Salem) 24 hours a day, 365 days a year, with an emergency stand-by team made up of 14 technicians. In addition, there is a back-up emergency response room (Salem 2) at the UME headquarters.
- The CSN has in place agreements and contracts ensuring the availability of a team of specialists belonging to an authorised UTPR, distributed throughout the national territory to respond to possible radiological emergencies; two mobile units for environmental radiological characterisation, one mobile internal dosimetry unit and a laboratory at Ciemat for the monitoring of contaminated samples.

- The CSN manages and ensures the operability of all the radiometric instrumentation assigned to the five nuclear emergency plans and of that in place to address radiological emergencies.

#### **Incidents**

In 2012 the CSN Emergency Response Organisation was partially activated on a single occasion as a result of an incident involving radioactive material at Barajas airport.

Twenty notifications of international events were received at the CSN emergency response room via the European Union's Ecurie system or the IAEA USIE (Unified System for Information Exchange in Incidents and Emergencies) website in 2012, none of these having any radiological repercussion on the Spanish territory.

Throughout the year, 17 notifications have been received at the Salem relating to accidental worker exposures or cases of external contamination, the deterioration of radiological sources or equipment, accidents or incidents during the transport of radioactive packages or incidents at radioactive facilities. In no case were there any noteworthy radiological consequences.

#### **3.5.2. Physical protection of nuclear materials and facilities**

The CSN's most relevant activities in this field during 2012 have been as follows:

- Publication of Safety Guide GS-08.02, *Preparation, content and format of physical protection plans for nuclear facilities and materials.*
- Implementation, following completion of the pilot phase, of the strategic area of security in the Integrated Plant Supervision System (SISC). This implied the performance of control inspections at all the nuclear power plants.

- Inspection of the physical protection systems at El Cabril and Ciemat.
- Reports have been issued on the Physical Protection Plans of all the nuclear power plants, the Juzbado manufacturing facility, the El Cabril disposal centre and the José Cabrera plant, which is currently in the dismantling phase.
- Collaboration in training of the Guardia Civil units stationed at the ports of Vigo and Bilbao in relation to their intervention in the Megaports protocol.
- Holding of the “First national course on the assessment of vulnerabilities in physical protection systems at nuclear power plants (CAV-2012)”, which was delivered at the Police Training Centre in Ávila.
- In relation to the technical protocol for collaboration between the CSN and the Directorate General of the Police and Guardia Civil, a training session was held with the nuclear power plants on threats with explosive devices.
- Members of the CSN personnel have participated in numerous international meetings on nuclear security organised by the IAEA, the NRC and the European Security Regulators Association.

## 4. Radioactive waste

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

#### Inventory of spent fuel and high level radioactive waste stored at nuclear power plants

The number of fuel assemblies stored at the nuclear power plants as of December 31<sup>st</sup> 2012 amounted to 13,590, of which 6,229 assemblies were at boiling water (BWR) plants and 7,361 at pressurised water reactor plants. Of these assemblies, 12,751 are stored in the pools of the respective plants and the remainder, 839, in the individualized storage facility (ATI) facilities of the Trillo (22 casks) and José Cabrera (12 casks) nuclear power plants

Given the forthcoming saturation of the spent fuel pools at groups I and II of the Ascó plant, in 2013 and 2015 respectively, an individualized storage facility (ATI) facility are being built on

the site. The ATI will use HI-STORM dry storage casks and will be equipped with two platforms capable of housing 32 casks, in compliance with the construction and assembly permit granted on September 29<sup>th</sup> 2011. Licensing for start-up of the facility took place throughout 2012 and elicited a favourable report by the CSN on April 4<sup>th</sup> 2013.

In June 2012, the CSN sent a Complementary Technical Instruction to Enresa, licensee of the dismantling Jose Cabrera plant and of its ATI facility, with the purpose of guaranteeing its fuel handling capability and its capacity to respond to beyond design basis events.

During 2012 four inspections were performed to control the management of spent fuel and high level or special wastes at the Ascó I and II, Vandellós II and Trillo nuclear power plants. In addition, an inspection was carried out at Ensa, the manufacturer of the HI-STORM 100 casks for Ascó, as part of the tracking of the manufacturing process of these items.

**Table 10. Inventory of spent fuel at end of 2012**

	ATI								Trillo	
	José Cabrera	Garoña	Almaraz I	Almaraz II	Ascó I	Ascó II	Cofrentes	Vandellós II	Pool	ATI
Assemblies in storage	377	2,505	1,328	1,252	1,228	1,136	3,724	1,020	558	462
Degree of occupation (%)	100	96.01	80.63	76.02	97.15	89.87	77.91	70.98	88.85	26.25
Year of pool saturation	-	2015	2021	2022	2013	2014	2021	2020	-	2040

#### Centralized Storage Facility (ATC)

The generic conceptual design, without a site selection, of the Centralized Storage Facility (ATC) facility was approved by the CSN on June 29<sup>th</sup> 2006.

Following the decision taken by the Cabinet of Ministers on December 30<sup>th</sup> 2011, approving the

municipality of Villar de Cañas (Cuenca) as the site for the Centralized Storage Facility (ATC) facility, preliminary licensing activities have now got under way. On April 26<sup>th</sup> 2012 the CSN agreed that tracking of the ATC would be performed within the framework of the CSN-Enresa Liaison Committee.



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

### Nuclear power plants

In 2012, the operating nuclear power plants generated solid low and intermediate level radioactive wastes with an estimated activity of 22,195.23 GBq, conditioned in 3,479 packages, as described in table 11.

### El Cabril disposal facility

The solid low and intermediate level waste generated at the nuclear and radioactive facilities are managed at the El Cabril disposal centre, which is equipped with 28 cells for this purpose on its north and south platforms. The El Cabril facility also has additional cells for the disposal of very low level waste on its east platform.

In 2012 a total 278 dispatches were received at the facility, 159 with low and intermediate level wastes (106 from nuclear facilities, 14 from incidents at non-regulated installations and 39 from radioactive facilities) and 119 with very low level wastes (116 from nuclear facilities and three

from radioactive installations), these containing the following:

- 4,835 packages and 27 samples from nuclear facilities.
- 953 packages or containment units from radioactive facilities.
- 420 containment units arising from incidents

As of December 31<sup>st</sup> 2012, the total number of low and intermediate level waste packages stored on the north and south platforms at El Cabril stood at 119,823, this implying 67.50% of their total capacity, and the number of very low level waste disposal units housed on the platform amounted to 10,016, 16.87% of the capacity of cell 29.

Likewise, in cells 26, 27 and 28 on the south platform, 96 ISO casks are being temporarily stored, with wastes from incidents at steelyards. A further four such casks are located on the terrace in front of the transitory reception building.

**Table 11. Nuclear power plants: low and intermediate level waste packages. Year 2012 (\*)**

Facility	Activity conditioned (GBq)	Conditioned packages generated	Packages sent to El Cabril	Packages stored at the plant to 31/12/2012	Plant stores occupation (%)
Sta. M <sup>a</sup> Garoña	244.72	222	219	3,941	41.2
Almaraz I and II	5,096.29	563	516	7,159	30.4
Ascó I and II	7,518.49	1,085	357	4,571	55.4
Cofrentes	5,060.08	974	827	8,768	69.2
Vandellós II	3,835.95	408	228	1,493	11.8
Trillo	439.70	227	252	678	6.2
<b>Totals</b>	<b>22,195.23</b>	<b>3,479</b>	<b>2,399</b>	<b>26,610</b>	<b>34.3</b>

(\*) Packages equivalent to 220-litre drums.

## 5. External relations

### 5.1. Public information and communication

#### Communication and website

Throughout 2012 a total 143 informative bulletins have been published, aimed at the media and at institutions interested in the areas of competence of the organisation. In addition to the incidents occurring at the nuclear and radioactive facilities, these bulletins also underlined the main agreements reached by the Board of Commissioners, from an informative point of view, the most significant institutional and international activities of the Spanish Nuclear Safety Council, the conferences held at the headquarters of the regulator and the mandatory emergency drills carried out each year. Likewise, 29 reviews of reportable events were published on the website, pursuant to the criteria in force for the notification of events. In addition, the media issued 463 direct requests for information, to which the appropriate replies were given.

During 2012, the CSN's corporate website received 384,790 visits. The Twitter account: @CSN\_es, continues to be an efficient tool for the broadcasting of information of different types, such as for example messages regarding regulatory news items, the updating of standards, breakthroughs in nuclear safety and radiological protection or relevant activities in the institutional and internal areas. During the year more than 1,300 followers of this social network were achieved, with somewhat more than a thousand micromessages issued.

The following were among the matters that required the greatest efforts in communication, due to their significance and the interest they aroused:

- Monitoring of the results of the stress tests to which the European nuclear power plants were subjected in the wake of the accident at Fukushima nuclear power plant. The different informative actions culminated with the public session held to present the results at the headquarters of the Ministry of Industry, Energy and Tourism (Minetur) (Madrid, October 25<sup>th</sup> 2012), organised in collaboration with the Association of Municipalities in Areas housing Nuclear Power Plants (AMAC).
- The International Workshop on Crisis Communication: Facing the Challenges, organised by the CSN in collaboration with the NEA (Madrid, May 9<sup>th</sup>-10<sup>th</sup> 2012).
- The different possibilities proposed regarding the future of Garoña nuclear power plant.

As regards the objective of transparency and enhanced communications pursued by all regulatory authorities, the CSN participated in the quarterly meetings of the Working Group on Transparency of the European Nuclear Safety Regulators Group (ENSREG) and in the yearly meeting of the Public Communications Group of the Nuclear Energy Agency (NEA/OECD)

#### Public information

As regards public information, the main activities carried out during 2012 were as follows:

- Publications: Publishing within the corresponding plan of a total 35 new works (books, the journal *Alfa*, brochures and posters) with a distribution of 40,196 copies; in addition, there were 16 publications in CD format, with a distribution of 4.906 copies, and the re-editing of 22 works with a distribution of 23,200 copies. During this period, 48,836 technical and informative publications were distributed.

- Information Centre: The centre received 6,641 visitors, mostly from educational centres and institutions. Collaboration with the Spanish national organisation for the blind, ONCE, has made it possible for all the modules at the Information Centre to be fitted with a panel providing information in Braille, and some of the informative leaflets are also available in this language.
- Congresses and exhibitions: CSN presence with a stand showcasing publications at the 7<sup>th</sup> Sessions on quality in the control of environmental radioactivity, held in Tarragona, the 38<sup>th</sup> Annual meeting of the Spanish Nuclear Society, held in Cáceres, and the CONAMA11 National Congress on the Environment, held in Madrid.
- With a view to providing more direct access to information for people residing in the vicinity of the Spanish nuclear power plants, a stand with publications was installed at the venues of the Local Information Committee meetings held in Almonacid de Zorita, Cofrentes and Almaraz.
- Series of conferences: on May 25<sup>th</sup> 2012, lieutenant general Emilio Roldán, head of the Military Emergency Response Unit (UME), gave a conference in the CSN assembly hall entitled *The Spanish security strategy and the role of the UME*.
- Public information: replies were given to 1,295 queries made via the “communications” mail application on the CSN website, as well as to 203 requests for publications via the “requests” address and 419 requests for information regarding visits to the CSN Information Centre.

## 5.2. Institutional relations

The CSN annual report on activities carried out in 2011 was submitted to the Congress and the Senate on June 25<sup>th</sup> 2012, and subsequently also to the regional parliaments of the autonomous

communities with nuclear facilities in their territories. On November 29<sup>th</sup> 2012, the president of the CSN appeared before the Congressional Commission for Industry, Energy and Tourism to report on the activities carried out in 2010 and 2011. In addition, in a response to requests from the parliamentary groups, information was provided on the stress tests performed at the Spanish nuclear power plants as a result of the Fukushima accident and on the process of closure and dismantling of the Garoña plant.

During the year the CSN has submitted to Parliament three reports in response to resolutions of the Commission and seven replies to parliamentary questions. Also submitted to the Congress were a draft CSN safety instruction, prior to its approval, and the National Action Plan, submitted to the European Commission, resulting from the stress tests performed at the Spanish nuclear power plants in the wake of Fukushima.

Particularly significant in 2012, in the context of relations between the CSN and the Central State Administration, have been the coordination meetings held between the Ministry of the Interior and those responsible for emergencies and the physical protection of nuclear materials, in keeping with the collaboration agreements signed; with the Ministry of Public Health, Social Services and Equality, constituting the Mixed Commission for Tracking of the Framework Agreement established for the Radiological Protection of Patients, and with the Ministry of Public Works in relation to the transport of radioactive materials.

The most noteworthy exponents of relations with the autonomous communities are the agreements for the entrustment of functions signed with nine of them: Asturias, the Balearic Islands, Catalonia, Galicia, the Canary Islands, Murcia, Navarre, the Basque Country and Valencia. A session on the coordination of inspections was held in 2012, with a view to improving the performance of these

functions, the bodies responsible for the entrustments in Asturias and the Balearic Islands were audited and a new inspector was incorporated in Murcia.

In addition, the CSN promotes the establishment of collaboration agreements with the autonomous communities in relation to the application of the Basic Directive on the Planning of Civil Defence with respect to Radiological Risk. In 2012 agreements of this type were signed with the communities of Valencia, Madrid, the Basque Country, Galicia, Castilla-La Mancha and Navarre.

In the area of local administration, the CSN develops its relations mainly through the Association of Municipalities in Areas Housing Nuclear Power Plants (AMAC) and its participation on the information committees held in the vicinity of the nuclear power plants. In 2012 the websites of these committees were launched, with information and links of interest for the population residing in the area of the plants. In addition, the AMAC collaborated in organising the seminar held at the Ministry of Industry, Energy and Tourism to present the results of the stress tests performed at the Spanish nuclear power plants

An important part of the CSN's efforts in institutional relations is directed towards companies, organisations operating in the sector, universities and social groups. Particularly significant in 2012 were the collaboration with the University of Cantabria in the organisation of a session on radon, the participation of members of the CSN Board of Commissioners in the 38<sup>th</sup> annual meeting of the Spanish Nuclear Society, the institutional visit to the National Accelerators Centre in Seville and participation in the *Meeting for presentation of the Spanish protocol on quality control in radiodiagnosis*, organised jointly by the Spanish Radiological Protection Society (SEPR), the Spanish Medical Physics Society (SEFM) and the Spanish Medical Radiology Society (SERAM).

Furthermore, with a view to promoting the training of technicians and specialists in the areas for which it is responsible, the CSN provides funds amounting to 180,000 Euros for three business chairs through agreements with the polytechnic universities of Madrid and Barcelona.

In 2012 the CSN provided aid for the performance of 10 training, information and educational projects relating to nuclear safety and radiological protection by way of a public call for application, granting a total 75,000 Euros.

### 5.3. International relations

In the field of international relations the CSN is responsible for collaborating with the Government in relation to international agreements on nuclear safety and radiological protection, for relations with international organisations working in these areas and for relations with its overseas counterparts. This implies a far-reaching set of activities that may be classified under the following headings:

- Multilateral relations.
- International conventions.
- Bilateral relations.

Particularly significant from among these in 2012 have been the peer review of the results of the stress tests carried out at the EU's nuclear power plants, the fourth review meeting of the Joint Convention, the second extraordinary review meeting of the Convention on Nuclear Safety and the International IAEA Conference on nuclear safety held in Fukushima (Japan).

#### Multilateral relations

*Within the framework of the European Union*

Along with the rest of the European regulators, the CSN participated in the peer review of the results of the stress tests performed at the European

nuclear power plants. In August 2012, on completion of this process, the European Union approved its Action Plan. Subsequently, in keeping with this European plan, the CSN drew up and submitted to the Commission the National Action Plan for post-Fukushima tracking.

Within the framework of the Atomic Questions Group of the Council of the European Union the CSN has participated in the analysis of various standards proposals, such as the future new directive on basic safety standards for radiation protection or the regulation that will establish the requirements to be applied to companies transporting radioactive material in the Union. In addition, within the European Nuclear Safety Regulators Group (ENSREG) the CSN has intervened in discussions on initiatives such as the consolidation of periodic peer reviews or the call during 2013 for the second European Conference on Nuclear Safety.

The CSN also participated in the steering group of the European Alara Network, which is dedicated to the optimisation of radiological protection, which met on two occasions in 2012.

The CSN participates in the definition, coordination and performance of the regulatory body assistance programmes within the framework of the European Commission's Instrument for Nuclear Safety Cooperation (INSC). In 2012 it intervened directly in the programmes aimed at Brazil and Morocco.

#### *Within the framework of the International Atomic Energy Agency (IAEA)*

In addition to the contribution implied by the CSN's technical participation in IAEA courses, seminars and missions, the Council also contributes economically to the Agency's programmes and activities. In 2012 the CSN made a voluntary contribution of 276,000 Euros, most of which went to financing the activities of the Ibero-American Forum of Radiological and Nuclear Regulators.

The CSN participated as part of the Spanish delegation in the General Conference of the IAEA, held in Vienna in mid September, and also intervened in the Ministerial Conference on nuclear safety, organised jointly by the Japanese Government and the IAEA in Fukushima.

The CSN participates in the Advisory Commission on Safety Standards (CSS) and members of the CSN personnel take part in a number of IAEA technical committees and working groups, such as the Safety Standards Committees on Radiological Protection (RASCC), Nuclear Safety (NUSSC), Transport (TRANSSC) and Wastes (WASSC), which normally meet twice a year. In 2012 it intervened also in specific groups involved in the classification and notification of incidents and accidents, in the activities of the International Seismic Safety Centre, in the international programme on the lessons learned on the ageing of nuclear facilities, in security and in the monitoring of the health of the workers.

Spain has collaborated by providing CSN technicians for IAEA international regulatory review system (IRRS) missions to Finland, Sweden and the Netherlands. Another habitual way of collaborating is through the organisation of courses, workshops and seminars, such as the IAEA conference on communication that took place in Madrid in June 2012, and the acceptance of scientific visits, of which there were four last year.

#### *Within the framework of other international organisations*

The CSN collaborates in the activities of the OECD's Nuclear Energy Agency (NEA). The mission of the NEA is the maintenance and improvement of the scientific, technological and legal bases guaranteeing the peaceful use of nuclear energy under safe, clean and economically effective conditions, which it performs in seven major areas through a number of working groups. The CSN participates on the steering committees of the most

important of these areas and in numerous working groups and projects. In 2012 the International Workshop on Crisis Communication: Facing the Challenges was held in Madrid, organised jointly by the CSN and the NEA.

In 2012 the CSN participated actively in the meetings of various international regulatory body associations, among them the International Nuclear Regulators Association (INRA), the Western European Nuclear Regulators Association (WENRA), the Ibero-American Forum of Radiological and Nuclear Regulators (Foro) and the association of Heads of European Radiological Protection Competent Authorities (HERCA).

Spain has been a full member of the UNSCEAR Scientific Committee since late 2011, for which a national representative from the CSN and several advisors have been appointed. The CSN participated in the 59<sup>th</sup> UNSCEAR Session in May 2012.

#### **International conventions**

The CSN coordinated Spain's participation in the second extraordinary meeting of the Convention on Nuclear Safety, held in August 2012. The meeting focussed on reporting on and discussion of the actions carried out by each of the contracting parties in relation to the Fukushima accident. It was agreed that a working group on the efficiency and transparency of the convention would be set up to issue proposals for improvement and thereby strengthen it.

The fourth review meeting of the Joint Convention, relating to safety in the management of radioactive waste and spent fuel, was held at the IAEA headquarters in May 2012. The CSN intervened in the drawing up of the Spanish report and has participated actively in all the phases of the convention.

The CSN participates as the Spanish representative on the Radioactive Substances Committee (RSC) of the Convention for the Protection of the Marine

Environment of the North-Eastern Atlantic (OSPAR). During 2012 the CSN drew up and submitted the Spanish reports for 2011 on releases from Spanish nuclear facilities, along with an estimate of the releases of radioactive effluents from non-nuclear installations. Likewise, the data for 2011 on the environmental surveillance of the waters of the Atlantic Ocean have been submitted.

#### **Bilateral relations**

Interaction between the nuclear and radioactive regulatory authorities of the different countries is essential, in view of the supranational nature of the potential impact of the sector and the global nature of the technologies applied. In this context, the CSN maintains intensive relations of collaboration with counterpart organisations in other countries, formalised through general or specific agreements in areas such as information exchange, R&D projects, training, the exchange of personnel, joint activities, etc.

Particularly significant among the aforementioned agreements, for their importance and volume of activity, are those undertaken with the United States and France. In 2012 these agreements have led to the assignment of two CSN inspectors to perform work for the NRC in relation to resident inspection and security, and to the exchange of personnel for extended visits with the French authority ASN, which provided an expert on dismantling, the CSN providing the French regulator with an expert on material ageing. Finally, mention may be made, among the many meetings that have taken place, of the CSN's participation in the first International Conference on Security organised by the NRC.

During 2012 there have also been technical exchange activities with Germany, South Korea, Japan, Morocco, Russia, Sweden and Ukraine. Likewise, in February 2012 a technical cooperation agreement was signed between the Chinese National Nuclear Safety Authority (NNSA) and the CSN.

## 6. Research and Development

The activities carried out by the CSN in this area are included in its Research and Development Plan, which sets out the conditions under which the projects to be undertaken during each four-year period will be performed. In early 2012 the CSN approved the Research and Development Plan for the period 2012-2015. The basic objectives established for the new plan are as follows:

- To contribute to ensuring a high level of nuclear safety and radiological protection at the nuclear and radioactive facilities existing in Spain, to the end of their service lifetime.
- To improve the surveillance and control of the exposure of workers and the public to ionising radiations.
- To continue progressing in the development of radiological protection in medical exposures.
- To have available within an appropriate timeframe the know-how and technical resources required to appreciate the risks associated with future installations and with the operation of existing facilities under modified operating conditions.

The plan is divided into 12 areas, the definition of which is heavily influenced by the accident at the Fukushima nuclear power plant. These areas are as follows: operation and management of nuclear fuel, materials performance and lifetime management, code development and modelling, safety assessment methodologies, on and off-site events, severe accidents, radioactive waste, control of exposure to radiation and environmental protection, dosimetry and radiobiology, radiological protection of patients, management of emergencies and security.

A total of 74 Research and Development projects have been in force during 2012, with 21 new projects having been started and a further 13 having been completed. These figures include both projects performed within the framework of arrangements and collaboration agreements with other bodies and those that have been subsidised.

The Research and Development budget for 2012 amounted to 3.1 million Euros, an identical amount to that budgeted in 2011.

In 2012 there was a call for subsidies for the performance of Research and Development projects, with a maximum duration of three years, a total endowment of 1,316,000 Euros and 14 lines of research.

## 7. Regulations and standards

In 2012 the CSN's activities in relation to standards led to the approval and publication of Council Instruction IS-34, on different criteria to be applied in the transport of radioactive materials (Official State Gazette No 30, of February 4<sup>th</sup> 2012).

In addition, the CSN approved five new Safety Guides (GS):

- Safety Guide GS-03.01. *Modifications at nuclear fuel manufacturing facilities.*
- Safety Guide GS-08.02. *Preparation, content and format of physical protection plans for nuclear facilities and materials.*
- Safety Guide GS-11.02. *Control of exposure to natural radiation sources.*
- Safety Guide GS-11.03. *Methodology for assessment of the radiological impact of NORM industries.*
- Safety Guide GS-11.04. *Methodology for the assessment of exposure to radon in the work place.*



## 8. Resources and means

### 8.1. Human resources and training

#### Human resources

As of December 31<sup>st</sup> 2012, the total workforce of the CSN amounted to 457 people, 53% women and 47% men, the average age being 50 years.

As regards academic qualification, 68% of the people working for the CSN are post-graduates, 6% graduates and 26% hold other qualifications.

The average age of the organisation's personnel overall is 50 years. The average age of the workers in the Technical Direction for Nuclear Safety (DSN) is 51, in the Technical Direction for Radiological Protection (DPR) 49 and in the rest of the organisation 50.

During the year an internal contracting process was carried out to replace a worker having a job post reservation.

Six civil servant job posts were covered by the system of open designation and 37 by the system of competition based on merit. The seventh application of the model of recognition of the professional experience of civil servants appointed to the Council affected 32 people.

No new job post for the CSN's civil servants was included in the Offer of Public Employment in 2012.

During 2012 the Nuclear Safety Council published the Resolution of December 14<sup>th</sup> 2011 establishing the regulatory bases of and call for eight training grants for specialisation in nuclear safety and radiological protection (Official State Gazette No 19, of January 23<sup>rd</sup> 2012).

The period for the submittal of applications ended on February 22<sup>nd</sup> 2012; a total 147 applications were received within that period that fulfilled the requirements and included the compulsory documentation set out in the call.

Following issuing of the mandatory report by the selection committee on June 22<sup>nd</sup> 2012, based on the criteria established in article 10 of the Resolution underlying the call for applications, and an allegation presented pursuant to article 9, section 8 having been resolved, the Presidency, in application of the provisions of article 11 of the aforementioned bases, approved the definitive awarding of the eight grants.

The complete contents of this resolution were included on the CSN bulletin board and on its website ([www.csn.es](http://www.csn.es)) and were published in Official State Gazette No 178 of July 26<sup>th</sup> 2012.

#### Training

The Training Plan for 2012 continued to be structured around seven programmes, one of which is divided in turn into three sub-programmes:

- Improvement and recycling technical programme (nuclear safety, radiological protection and support areas).
- Management skills development.
- Administrative management.
- Prevention.
- General computer science.
- Languages.
- Skills.

The Training Plan for 2012 was drawn up on the basis of the results of the evaluation performed

within the framework of the Competence-Based Management System. This system is based on an upfront definition of the competences required for the different job posts and on an evaluation of the competences of those occupying these posts. This evaluation, carried out jointly by the person occupying the post and his or her immediate superior, serves to detect possibilities for improvement and to define an individual development plan. The CSN Training Plan is built around each of the individual development plans and deploys activities in response to the training needs of specific persons and groups while also including actions aimed at the employees overall, in all cases in alignment with the Strategic Plan.

During 2012, the total number of hours dedicated to personnel training amounted to 23,618, with an average of 2.40 participations per person in training activities and a total cost of 321,766.44 Euros. In addition, promotion of the presence of the Council in national and international forums (congresses, meetings, seminars...) relating to its functional activities and realm of competence has continued.

The average evaluation of the courses by those attending in 2012 reflects a high degree of adequacy, a score of four having been achieved (on a scale of one to five).

## 8.2. Economic resources

As regards economic and financial matters, the CSN is governed by the provisions of the General Budget Act, Law 47/2003, of November 26<sup>th</sup>, inasmuch as it is an entity included in the state public administrative sector in the terms established in articles 2.1.g and 3.b)1, as a result of which it is subject to the Public Accounting regime and the Accounting Instruction for the State Institutional Administration.

The accounting of the organisation is in accordance with the General Public Accounting Plan, the economic aspects being broken down into budget items (income and expenses) and financial items (accounts and balance sheet).

### Budgeting aspects

The definitive budget for 2012 amounted to 47.287 million Euros, with no modification with respect to the initial budget, this implying a reduction of 1.65% with respect to the previous year.

As regards income, the net recognised revenues amounted to 42.574 million Euros, a figure of 90.03% of execution of the definitive budget, with a variation of -1.58% with respect to the previous year. Of this figure, 95.28% corresponded to fees and public prices.

As regards outgoings, the net recognised obligations amounted to 41.19 million Euros, a figure of 87.11% of execution of the definitive budget, with a variation of -1.37% with respect to 2011.

### Financial aspects

The accounts show a positive result of 4.603 million Euros in 2012.

As regards income, the fees for services rendered were the main source of CSN funding, representing 88.80% of the total, the remaining 11.20% corresponding to current subsidies and transfers, financial revenues and other operating income.

As regards outgoings, 54.76% corresponded to personnel costs, 35% to supplies and external services, 5.98% to provisions for amortisations, 3.84% to transfers and subsidies and the remainder to taxes, financial expenses and other ordinary management costs.

### 8.3. Information systems

The consolidation of services for the general public via the Electronic Office has continued in 2012, an increase of 28% in the use of this service for the transaction and sending of documents having been registered with respect to 2011. The number of sealed sources on the register rose to 1,848, the number of procedures carried out rose from 4,460 in 2011 to 5,714 in 2012 and the number of

documents sent via the telematic register went from 4,123 to 5,056.

The CSN contingency centre, a back-up data centre at which the CSN's servers, applications and critical data are continuously replicated, entered service in 2012. The back-up Emergency Response Room (Salem 2), installed at the general headquarters of the Military Emergency Response Unit (UME), also went into service during the year.

## 9. Strategies and management system

### 9.1. Strategic Plan and Annual Work Plan

In 2011 the Nuclear Safety Council approved the Strategic Plan for 2011-2016, which represents its commitment to society for the coming years in relation to the fundamental objective of maintaining the highest level of nuclear and radiological safety and to the means available to achieve this objective.

The strategic plan is developed by way of annual work plans (PAT), which are approved by the Nuclear Safety Council and include operating objectives and the most significant activities to be performed during each year, as well as numerical objectives or indicators.

The PAT for 2012, approved on February 15<sup>th</sup> 2012, defined the objectives and activities to be performed by the CSN during the year, the overall planning of assignments, overall details of activities by facilities, inspection plans, the standards programme, the programme of procedures, the programme of audits and the R&D projects, among others.

The PAT tracking reports incorporate the results of the indicators established in the Strategic Plan. The results obtained for 2012 indicate that seven of the eight indicators were fulfilled; the indicator referring to *Losses of control of low intensity radioactive sources* was given as unfulfilled as a result of the incident involving loss of traceability in the control of disused radioactive sources at the Ascó plant, which gave rise to a proposal for sanctions proceedings in February 2013.

Tracking of the Annual Work Plan is accomplished by means of a control panel that includes the

numerical values of a total of 19 indicators, established for the tracking of the most significant activities of the Plan. These values are compared to the previously established objectives. The values of the control panel for 2012 reflect a degree of compliance close to 100%.

### 9.2. Management System

The CSN has implemented a process-oriented Management System based on the requirements of IAEA guideline GS-R-3 and on the ISO 9001:2008 standard. The system is described and developed in manuals and procedures. The Management System Manual contains an overall description of the system and the corresponding documentation.

The management system implemented at the CSN requires the entire organisation to be subject to a process of on-going improvement. In addition to the evaluations of compliance with the plans and objectives, the CSN has established an internal audits plan and is systematically subjected to external evaluations by national and international organisations.

In this context, the CSN has a Management System Committee that has the following functions:

- Proposing the strategy of the CSN as regards the management system, development and supervision of implementation.
- Knowledge of and reporting on the proposals regarding management manuals and procedures, and their revisions, prior to their being submitted to the Board of Commissioners.
- Analyse the evaluations of CSN processes and activities, proposing, promoting and supervising improvement plans.

- Monitor the application of these plans and make whatever review proposals might be required.
- Others established in the manuals and procedures of the Management System.

During 2012 the basic internal auditing plan was modified and divided into two disengaged parts: one for CSN activities and the other for the functions assigned to the autonomous communities.

The following six internal processes were audited during the year: radioactive facility personnel licences, competence-based management of human resources, information systems, management system (by an external auditor), management of sanctions proceedings at nuclear facilities and

management of sanctions proceedings at radioactive facilities. The performance of the functions entrusted to the autonomous communities of Asturias and the Balearic Islands have been also audited.

The results of all the audits were adequately documented and a series of non-conformities was identified and communicated to those responsible for resolution. None of the non-conformities may be considered to be significant from the point of view of safety.

As regards the publishing of procedures developing the Management System, 27 new procedures were issued in 2012 (three relating to management, nine administrative and 15 technical), and five already existing procedures were revised.



## Appendix I. List of abbreviations and acronyms

AEAT	State Tax Administration Agency ( <i>Agencia Estatal de Administración Tributaria</i> ).	Enresa	Spanish national radioactive waste management agency ( <i>Empresa Nacional de Residuos Radiactivos, S.A.</i> ).
ANAV	Ascó-Vandellós Nuclear Association ( <i>Asociación Nuclear Ascó-Vandellós II A.I.E.</i> ).	ENSREG	European Nuclear Safety Regulators Group.
AMAC	Association of Municipalities in Areas housing Nuclear Power Plants ( <i>Asociación de Municipios en Áreas de Centrales Nucleares</i> ).	ERO	CSN Emergency Response Organisation.
AQG	Atomic Questions Group of the Council of the European Union.	ERSP	Environmental Radiological Surveillance Programme.
ASER	Asúa Erandio, S.A., industrial company.	Euratom	European Atomic Energy Community.
ASN	French nuclear safety authority ( <i>Autorité de Sûreté Nucléaire</i> ).	Foro	Ibero-American Forum of Radiological and Nuclear Regulatory Authorities.
ATI	Individualized Storage Facility ( <i>Almacenamiento Temporal Individualizado</i> ).	FUA	Andújar uranium mill ( <i>fábrica de uranio de Andújar</i> ).
Bq	Becquerel.	GBq	Gigabecquerel.
BWR	Boiling Water Reactor.	GS	CSN Safety Guide.
CD	Compact Disc.	GWh	Gigawatt-hour.
Ciemat	Centre for Energy-Related, Environmental and Technological Research ( <i>Centro de Investigaciones Energéticas, Medioambientales y Tecnológicas</i> ).	HERCA	Heads of European Radiation Control Authorities.
COMS:	Cold Overpressure Mitigation System.	HI-STORM	Holtec International Storage and Transfer Operation Reinforced Module.
Conama	National Congress on the Environment.	IAEA	International Atomic Energy Agency.
Convex	IAEA international emergency drill.	INES	International Nuclear Events Scale.
CSN	Spanish Nuclear Safety Council ( <i>Consejo de Seguridad Nuclear</i> ).	INEX	OECD Nuclear Energy Agency international emergency exercise.
DGPCE	Directorate General for Civil Defence and Emergencies ( <i>Dirección General de Protección Civil y Emergencias</i> ).	Ingesa	National Institute for Healthcare Management ( <i>Instituto Nacional de Gestión Sanitaria</i> ).
DOE	US Department of Energy.	INRA	International Nuclear Regulators Association.
Ecurie	European Community Urgent Radiological Information Exchange System.	INSC	European Commission's Instrument for Nuclear Safety Cooperation.
EMERCON	System for notification of emergencies and requests for assistance.	IPA	European Union pre-membership projects.
Enac	National Accreditation Organisation.	IRRS	Integrated Regulatory Review Service.
		IS	Nuclear Safety Council instruction.
		ISO	International Standardization Organization.
		ITC	Complementary Technical Instruction ( <i>Instrucción Técnica Complementaria</i> ).
		LDL	Lower Detection Limit.

MD (SISC)	Situation of “Multiple degradations” in the SISC action matrix.	PIMIC	Integrated Plan for Improvement of the Ciemat Facilities ( <i>Plan Integrado de Mejora de las Instalaciones del Ciemat</i> ).
Megaports	Protocol for action in response to the inadvertent movement or illicit trafficking of radioactive material in ports of general interest.	Procura	Organisational, cultural and technical reinforcement plan of the Ascó-Vandellós Nuclear Association.
Minetur	Ministry of Industry, Energy and Tourism.	Pvrain	Independent environmental radiological surveillance programme.
mSv	Millisievert.	PWR	Pressurized Water Reactor.
MW	Megawatt.	R&D	Research and Development.
N/A	Not applicable.	RTC	IAEA regional training course.
NEA	Nuclear Energy Agency of the OECD.	Salem	CSN emergency response room.
NPP	Nuclear power plant.	SISC	CSN Integrated Nuclear Power Plant Supervision System ( <i>Sistema Integrado de Supervisión de Centrales Nucleares</i> ).
NRBQ	Nuclear, Radiological, Bacteriological and Chemical.	SPR	Radiological Protection Service ( <i>Servicio de Protección Radiológica</i> ).
NRC	US Nuclear Regulatory Commission.	Sv	Sievert.
OECD	Organisation for Economic Cooperation and Development.	EU	European Union.
Osart	IAEA Operational Safety Review Team.	UME	Military Emergency Response Unit ( <i>Unidad Militar de Emergencias</i> ).
Ospar	Convention on Protection of the Marine Environment of the North-Eastern Atlantic (Oslo-Paris Convention).	UNSCEAR	United Nations Scientific Committee on the Effects of Atomic Radiation.
OTS	Operating Technical Specifications.	UTPR	Radiological Protection Technical Unit ( <i>Unidad Técnica de Protección Radiológica</i> ).
PAT	CSN Annual Work Plan ( <i>Plan Anual de Trabajo</i> ).	WENRA	Western European Nuclear Regulators’ Association.
PD (SISC)	“Pillar degraded” situation in the SISC action matrix.		



**Spanish Nuclear Safety  
Council report to the  
Parliament**

Year 2012 Summary