

Spanish Nuclear Safety Council report to the Parliament

Year 2009 Summary

CSN

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Introduction

The Nuclear Safety Council (CSN) hereby submits to the Spanish Congress and Senate, and to the parliaments of those autonomous communities in which nuclear facilities are located, its annual report on the activities of the Organisation.

This document describes the main actions undertaken by the CSN in 2009, in keeping with the activities assigned to it by Law 15/1980, for the supervision and licensing of facilities and activities relating to ionising radiations, as well as any other activity associated with nuclear safety and radiological protection in the country.

For the last three years the CSN has been using the Integrated Plant Supervision System (SISC), a basic tool for the assessment of plant operation from the point of view of safety. A novelty in 2009 has been the initiation of preparations to incorporate in the system aspects relating to physical protection and the safety culture. As regards the results of the SISC during 2009, the Spanish nuclear power plants have performed correctly. During this period, the majority of the nuclear power plants have been in the *licensee response* column, this meaning that they have operated normally, with only the Ascó I, Ascó II and Vandellós II plants having required any special regulatory action within the framework contemplated by the system. By the end of 2009 the Ascó I plant had left the *degraded area* situation in which it had been since 2008 as a result of the radioactive particle release event, following approval by the CSN of revision 2 of the *Organisational, cultural and technical reinforcement plan (Procura)* required of the licensee, which is now in the development phase.

During 2009 the Spanish plants reported on 87 events; in themselves these did not constitute any safety indicator and in the vast majority of cases, 99%, referred to operating deviations of no safety significance, in accordance with the IAEA's International Nuclear Events Scale (INES). Only one event was classified as an level 1 anomaly on this scale, in 2009, this being the detachment of a fuel sub-assembly that was being inspected at Cofrentes nuclear power plant during its refuelling outage.

Particularly significant in the area of nuclear power plant licensing in 2009 were the technical studies performed by the CSN for renewal of the operating permit of the Santa María de Garoña NPP.

The renewal requested implied the 40 years of the design lifetime of a nuclear power plant being exceeded for the first time in Spain. For this reason, in addition to the aspects normally evaluated for the renewal of an operating

permit, such as compliance with the limits and conditions of the authorisation in force and associated complementary technical instructions, the periodic safety review and implementation of the conditioned application standards, aspects relating to the long-term operation of the plant were also analysed, this including the integrated ageing assessment and management plan, a proposal regarding a supplement to the safety analysis report, a proposal for revision of the operating technical specifications, a study of the radiological impact associated with long-term operation and a proposal regarding revision of the radioactive waste and spent fuel management plan.

The technical decision issued by the CSN favoured the renewal of the permit for 10 years (2009-2019), establishing a series of limits and conditions, and was submitted to the Ministry of Industry, Tourism and Trade on June 5th 2009. On July 3rd 2009, the said Ministry issued a Ministerial Order establishing that the date of definitive shutdown of the plant would be July 6th 2013 and authorising its operation until that date.

Also noteworthy have been the mandatory reports for authorisation of the power upgrading of the Almaraz I nuclear power plant, with an 8% authorised increase in maximum thermal power, and for authorisation of the start-up of the new safeguards cooling water system at the Vandellós II plant, this functioning as a safety system and replacing the old essential services water system that gave rise to the 2004 incident. During this same period, work has continued on the technical studies required for the renewal of the operating permits of the Almaraz I and II and Vandellós II nuclear power plants, whose current authorisations expire during 2010.

The final radiological report on the particle release event that occurred at Ascó I in 2007 was submitted to Parliament in 2009. The report confirms the absence of any real radiological impact for persons, the limited scope of the off-site emission and the progress made in the radiological standardisation of the site, which has already been completed in 2010.

Also particularly significant during 2009 has been the favourable report issued by the CSN authorising the dismantling of the José Cabrera nuclear power plant and the transfer of ownership of the facility to the national radioactive waste management agency: Empresa Nacional de Residuos Radiactivos (Enresa), for the initiation of the dismantling process.

This year there has been a verification visit by the European Commission, pursuant to article 35 of Euratom Treaty, to assess the situation of the Marismas de Mendaña phosphogypsum pools and the Inert Products Recovery Centre (CRI-9) in Huelva. The final report by the European Commission, received

during the first quarter of 2010, concludes that the radiological surveillance programmes and studies in place are appropriate and efficient.

Also in relation to radiological protection, during 2009 the CSN, in collaboration with the Carlos III Institute of Health, completed an epidemiological survey aimed at investigating the possible effects of ionising radiations on the health of populations living around nuclear facilities. In April 2010 the Ministry of Public Health and Social Affairs submitted the final report and the results of the epidemiological survey to Parliament.

In view of the measures provided by the different environmental radiological surveillance networks in place, the radiological quality of the environment, both in the vicinity of nuclear facilities and in the national territory overall, may be seen to have remained within normal values.

During 2009, 103,671 professionally exposed workers have been controlled, these presenting an individual average dose of 0.88 mSv/year. These data are included in the CSN's National Dosimetry Bank, which centralises the dosimetry records of exposed workers since 1985.

As regards the granting of operating licences, during 2009 the CSN has issued a total 429 decisions, 54 for authorisations at plants, 13 for nuclear fuel cycle and storage facilities and research centres and 362 relating to radioactive facilities, and has granted 4,006 new licences for the operating personnel of nuclear and radioactive facilities.

As part of its inspection responsibilities, the CSN has carried out a total 2,081 inspections: 202 at nuclear power plants, 45 at nuclear fuel cycle and storage facilities and research centres, 27 at installations in the process of dismantling and decommissioning and 1,741 at radioactive facilities in the areas of industry, research and medicine, and 66 at nuclear and radioactive material transport.

As regards the legal framework, mention may be made of the approval of Council Directive 2009/71/Euratom, of June 25th 2009, which establishes a community framework for the nuclear safety of nuclear facilities and which will need to be transposed to the national legislation. In 2009 the CSN has approved four new safety instructions on the safety requirements relating to spent fuel storage casks, the requirements applicable to modifications at nuclear power plants, one applicable to in-service inspection at the plants, and the safety requirements necessary for ageing management and the long-term operation of nuclear power plants. Likewise, a safety guide has been approved relating to the site emergency plan at radioactive facilities.

Especially significant within the framework of institutional collaboration has been the signing of a collaboration agreement with the Military Emergency Response Unit (UME) on nuclear and radiological emergency planning, preparedness and response, and of a collaboration agreement with the Spanish Electricity Industry Association (Unesa) in relation to R&D.

The CSN has continued to develop its transparency policy, implementing in 2009 the requirements necessary to make information available to the members of the public, in compliance with Law 11/2007 of June 22nd on electronic access to public services, using for this purpose its new corporate website, placed in service in 2009.

During 2009 the CSN has implemented a competence-based management model in line with the objectives included in the Strategic Plan for 2005 – 2010 and in keeping with the requirements of the International Atomic Energy Agency (IAEA) relating to the qualification of persons and their involvement in the safety culture.

In the area of international relations, 2009 saw the 3rd meeting of the Joint Convention on Safety in the management of spent fuel and in the management of radioactive waste. The report presented by Spain identified good practices such as the improvement of the legislative and regulatory framework, the General Radioactive Waste Plan approved in 2006 and the entry into operation of the very low level radioactive waste disposal facility at El Cabril, among others. The new challenges to be met by Spain were also identified, among them the construction of the Centralised Temporary Storage (ATC) facility.

Finally, mention is to be made of the partial renewal of the Council, in accordance with the provisions of Law 15/1980 and by virtue of Royal Decree 307/2009, pursuant to which counsellor Antoni Gurgu  Ferrer took possession of his post on March 6th 2009, replacing Julio Barcel  Vernet, whose term had expired.

The CSN still awaits the outcome of the administrative proceedings relating to its Charter, in accordance with the final provision of Law 33/2007, the final resolution of which will, among other things, allow it to initiate proceedings for the start-up of the Advisory Committee for information and public participation in relation to nuclear safety and radiological protection.

1. The Nuclear Safety Council

As from the month of March, when Commissioner Julio Barceló Vernet was replaced (Royal Decree 306/2009, of March 6th) on completion of the period for which he was appointed in 2001, the Nuclear Safety Council has been made up of the following members:

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

The meeting of the Cabinet held on March 6th 2009 dealt with the cessation of Julio Barceló Vernet as Commissioner of the Nuclear Safety Council (Royal Decree 306/2009) and the appointment in his place of Antoni Gurguí Ferrer (Royal Decree 307/2009), who took possession of his post on March 12th 2009 in the presence of the Minister of Industry, Tourism and Trade, the new Council being constituted on March 16th 2009.

The basic reference legal framework for the activities of the Council is determined by Law 15/1980, as modified by Law 33/2007, along with the regulatory provisions contained in Royal Decree 1157/1982, of April 30th, which approved the Statute of the Nuclear Safety Council.

During 2009 proceedings have continued regarding the proposed new Statute, approved by the Plenary Session of the Nuclear Safety Council during its session of September 11th 2008 and submitted to the Government via the

Ministry of Industry, Tourism and Trade on September 29th 2008 in accordance with the first final provision of Law 33/2007, which empowered the Government to approve the modification of the Statute of the Nuclear Safety Council within a maximum period of nine months as from its entry into force.

The draft of the new Statute includes provisions relating to the operation of the Advisory Committee for information and public participation contemplated in Law 33/2007, deals with the obligation of the workers to report on events actually or potentially affecting the safe operation of facilities, and adapts the organisational structure and legal arrangements to the needs and changes in the standards that have occurred since the approval of the Statute still in force, integrating the reforms introduced since that time into the legal framework for the performance of the Organisation.

During 2009 there have been certain important novelties on the regulatory and standards scene relating to the activities of the Nuclear Safety Council, among them the approval of Council Directive 2009/71/Euratom, of June 25th 2009, establishing a community framework for the nuclear safety of nuclear facilities and the obligations of the European Union countries on relation to nuclear regulation and safety.

The Nuclear Safety Council held 46 plenary sessions, 42 ordinary sessions, three extraordinary sessions and one for the constitution of the Council following the incorporation of Commissioner Antoni Gurguí i Ferrer.

The extraordinary sessions were due to the urgency of taking decisions regarding the authorisation for the start-up of the engineered safeguards cooling system at Vandellós II nuclear power plant, authorisation for revision

of the operating technical specifications and the off-site dose calculation manual of the Juzbado fuel assembly manufacturing facility as a result of the event reported on May 14th 2009, and approval of the report sent by the Nuclear Safety Council to the Ministry of Industry, Tourism and Commerce in response to its request regarding the granting by the Government of an extension of the operating permit for the Garoña nuclear power plant for a period of two, four or six years.

As has been characteristic since the beginning of the current term in late 2006, the decisions of the Council have typically been on the basis of consensus among its members, all the agreements having been adopted unanimously and without the need to put them to the vote, this notwithstanding the different points of view that have arisen on occasions.

The Board of the Council, as the management body, has adopted 485 Agreements, 42 of these being tasks commissioned to the working departments of the Organisation, to the Secretariat General or to the members of the Council themselves. Of the latter, 24 were resolved during the course of the year.

Annex I includes the main agreements adopted by the Board of the Nuclear Safety Council during 2009.

The Council has been informed on the adoption of a total 518 additional decisions in 2009, in keeping with the delegations in force in other organisations. During the year the Council delegated certain areas of competence to the Nuclear Safety Technical Division in relation to the transport of radioactive material (warnings, corrective measures and associated coercive fines).

The CSN policy of transparency has continued to be driven forward in 2009. This process, initiated in 2005, has given rise to improvements in the information on the operation and activities of the Organisation and that provided to society. Along with other significant changes, considerable attention has been dedicated this year to informing both the institutional structure of the State and the population in general. Particularly noteworthy in this respect has been the reinforcement of the Nuclear Safety Council's participation on the Information Committees existing in the vicinity of the nuclear power plants and the renewal of the CSN Website, with clear improvements in terms of accessibility, rigour and transparency. The start-up of the Advisory Committee for information and public participation, following approval by the Government of the new Statute of the Nuclear Safety Council, will constitute a new milestone in transparency.

The Council Commissions have continued to promote the activities commissioned to them in the areas of strategic planning, standards, external relations, resources and media and training and R&D under the leadership of the different members of the Council. The following have been particularly significant among the main issues dealt with by the Council Commissions:

- Initiation of the programme of audits required by the IRRS Mission and tracking of the audits performed and actions deriving therefrom.
- Tracking of the actions deriving from the IRRS Mission and drawing up of the report submitted to the Congress on the situation of these actions.

- Development of the draft of the Project for the reform of the Statute of the Nuclear Safety Council.
- Council Directive 2009/71/Euratom, of June 25th 2009, establishing a community framework for the nuclear safety of nuclear facilities.
- Plan for communication of the CSN report on the request for renewal of the operating permit for the Santa María de Garoña nuclear power plant.
- Presentation of the new CSN institutional website.
- Tracking and development of the different subject-specific JRC and the general services portal involved in the project for the adaptation of the CSN services to Law 11/2007 on electronic access to public services for the members of the public.
- Tracking of activities for the integral reform of the CSN headquarters building.
- Discussion of the new R&D agreement with Unesa.
- Systematic tracking of progress of the project for the implementation of the competence-based management model.

In addition to the Council Commissions, and under the presidency of the Secretariat General of the Council, the objective of the Commission for nuclear safety and radiological protection is the exchange of technical information between the working organisations and the members of the Council regarding the proposals to be submitted to the Plenary of the Council and issues of greater interest or technical complexity.

The following are particularly significant among the main issues dealt with by this Commission:

- Forecasts for the start-up of the engineered safeguards cooling system at the Vandellós II nuclear power plant.
- Integrated ageing assessment and management plan at the Santa María de Garoña nuclear power plant.
- Final report on the integrated assessment of the circumstances and radiological consequences of the particle release event at Ascó I nuclear power plant.
- Draft technical decision on the request for authorisation of the transfer of ownership and dismantling of the José Cabrera nuclear power plant.
- Power upgrade at Almaraz nuclear power plant.
- Presentation of the Procura Plan of the Ascó-Vandellós II Nuclear Association.

As regards the participation of the members of the Council in activities in representation of the Organisation and in management of the working groups, the following were particularly significant in 2009:

- The meetings of the European Nuclear Safety Regulators Group (ENSREG), with a view to achieving a high and harmonised level of safety at the nuclear facilities of the European Union, in particular through the approval of Council Directive 2009/71/Euratom, of June 25th 2009, which establishes a community framework for the safety of nuclear facilities.

- Presentation of the national report to the 3rd Review Meeting of the Joint Convention on Safety in the Management of Spent Fuel and Safety in the Management of Radioactive Waste.
- Participation in the 53rd IAEA General Conference, during which Yukiya Amano took over from Mohamed El Baradei as Director General.
- Management of the working group on the radiological protection of patients, set up in order to define the scope and specify the activities of this new CSN function.
- Management of the internal working group for analysis of the event involving the release of radioactive particles at Ascó I nuclear power plant, this group completing its activity in April with the issuing of the corresponding report.

As regards the information provided to Parliament, the Council has duly met all its

obligations and has replied to written questions from the Congress and Senate and to the Resolutions of the Congressional Commission for Industry, Tourism and Trade.

The 2008 annual report on activities was submitted to the Congress and the Senate in June 2009, in accordance with article 11 of Law 15/1980, in the wording given by Law 33/2007. The report was also sent to the Parliaments of those Autonomous Communities in which there are nuclear facilities, as well as to the Parliaments of those Autonomous Communities with which the Nuclear Safety Council has function Assignment Agreements.

This year there has been no specific request for the Council to appear before the Congress or the Senate; nevertheless, in accordance with the agreement with the Congressional Commission for Industry, Tourism and Trade, the President of the Council appeared on December 2nd 2009 to present the Report on the activities of the Nuclear Safety Council during 2008.

2. Supervision and control of installations and activities

2.1. Nuclear power plants

2.1.1. Operation

The six nuclear power plants (eight reactors) indicated in table 1 were in operation throughout 2009.

The overall evaluation of the operation of the nuclear power plants is carried out by considering fundamentally the results provided by the Integrated Plant Supervision System (SISC), the events reported, especially those classified on the INES Scale at a level higher

than zero, the radiological impact, the dosimetry of the workers, the relevant modifications considered, warnings and sanctions issued and operating events.

Integrated Plant Supervision System (SISC)

The SISC is currently the fundamental instrument for the assessment of plant performance, the planning of the CSN's regulatory efforts and communication to the public on both these issues.

The CSN website has a specific link on the SISC (www.csn.es/sisc/index.do), which includes the updated quarterly results of the system for all the nuclear power plants and the underlying operating information, as well as descriptive documentation and the corresponding procedures.

Table 1. General information on the nuclear power plants and their operation in 2009

	Almaraz I	Almaraz II	Ascó I	Ascó II	Vandellós II	Trillo	Garroña	Cofrentes
Type	PWR	PWR	PWR	PWR	PWR	PWR	BWR	BWR
Thermal power (MW)	2,947 ⁽²⁾	2,729	2,950,6	2,950.6	2,940.6	3,010	1,381	3,237
Electrical output (MW)	1,045 ⁽²⁾	984	1,028	1,026	1,087.1	1,066	466	1,104
Start-up permit	13-10-80	15-06-83	22-07-82	22-04-85	17-08-87	04-12-87	30-10-70	23-07-84
Permit in force	08-06-00	08-06-00	02-10-01	02-10-01	26-07-00	16-11-04	05-07-09	19-03-01
Period of validity (years) in force	10	10	10	10	10	10	Until 06-07-13	10
Refuelling outage	02-11-09 to 16-01-10	19-04-09 to 12-06-09	23-05-09 to 19-07-09	N/A	14-03-09 to 28-07-09	10-02-09 to 03-04-09	28-02-09 to 03-04-09	06-09-09 to 20-10-09
Operating factor %	85.91	89.80	65.73	90.65	59.95	84.91	89.66	86.97
Load factor %	81.31	86.95	63.80	82.51	56.58	82.48	87.69	84.13
SISC indicators > green	–	–	2 whites	–	–	–	–	–
SIC findings > green	–	–	–	–	–	–	–	–
Events INES Level > 0 ⁽¹⁾	–	–	–	–	–	–	–	1 level 1

(1) Events reported by the nuclear power plants in 2009 that have been classified by the CSN above level 0 on the INES Scale.

(2) Resolution of the Ministry of Industry, Tourism and Trade of December 18th 2009 authorising the licensee of the Almaraz nuclear power plant to modify the design in order to increase the power of Group I to 2,947 MW thermal.

During 2009 no inspection finding exceeded the green classification category and only the two indicators described below exceeded this classification:

- One *white indicator* at Ascó I during the fourth quarter of 2009 relating to the number of non-scheduled scrams per 7,000 hours of reactor criticality, due to the occurrence of three such scrams in the last four quarters.
- One *white indicator* at Ascó I during the fourth quarter of 2009 due to failures of the emergency diesel generators, deriving from two start-up failures in the fourth quarter of 2008, one during the first quarter of 2009 and another during the third quarter of 2009.

These results, and the findings and indicators for 2008 that were brought over and taken into account by the SISC, go to make up the action matrix shown in table 2 for the four quarters of 2009 and for all the plants.

Particular attention may be brought to the fact that the Ascó I plant has remained for three quarters of 2009 with a *degraded area*, due to

the continued presence of a yellow finding in the area of radiological protection of the public and a white finding for operational radiological protection, both of these being a result of the event involving the release of radioactive particles from the fuel building during the second quarter of 2008.

Reportable events

Throughout 2009 the licensees of the nuclear power plants reported a total 87 events, only one of which was classified as level 1 on the International Nuclear Events Scale (INES).

The level 1 event in question occurred on September 22nd 2009 at the Cofrentes plant, and consisted of the dropping of a fuel sub-assembly during transfer at the spent fuel pool for inspection.

This sub-assembly, one of the four sets of 5x5 rods that go to make up each fuel assembly, fell onto the platform of the tool used to dismount these elements, pivoting on its lower end and coming to rest in the horizontal position supported by the aforementioned platform and the grips of other fuel assemblies located in the pool.

Table 2. Summary of the action matrix for the four quarters of 2009 (Action matrix status during 2009)

	Quarter I	Quarter II	Quarter III	Quarter IV
Almaraz I	–	–	–	–
Almaraz II	–	–	–	–
Ascó I	One degraded pillar	One degraded pillar	One degraded pillar	Regulatory response
Ascó II	Regulatory response	Regulatory response	Regulatory response	Regulatory response
Cofrentes	–	–	–	–
Garroña	–	–	–	–
Trillo	–	–	–	–
Vandellós II	Regulatory response	–	–	–

(–) Licensee Response.

Following the corresponding inspection and CSN approval of the manoeuvres used in its recovery, the sub-assembly was once again integrated into its original assembly after confirmation that it had not suffered any damage.

Sanctions and warnings

During 2009, the CSN proposed to the Ministry of Industry, Tourism and Trade one sanctions proceeding and three warnings to be issued:

- Sanctions proceedings against Almaraz nuclear power plant for two slight faults: one for not having declared in due course the inoperability of the seismic separating seals between buildings as fire barriers and, once this inoperability had been declared, for not carrying out certain of the compensatory surveillance rounds and recording them as performed.
- A warning to Cofrentes nuclear power plant for non-compliance with the authorisation for its low activity parts store, due to the facility's having stored contaminated metallic parts in an area outside the said store.
- A warning to Trillo nuclear power plant for not having declared as inoperable a number of seismic separating seals between buildings.
- A warning to Trillo nuclear power plant for non-compliance with Council Instruction IS-11 on the training of operating personnel.

2.1.2. Licensing

In 2009 the Nuclear Safety Council issued 54 reports regarding authorisations and 18 favourable appraisals, most of them in relation to requests by the plants for the revision of

official operating documents. Among the issues reported on, the following may be singled out for their relevance:

- Almaraz and Vandellós II nuclear power plants: modification of the Operating Technical Specifications in relation to the cold shutdown cooling system overpressure protection system.
- Almaraz I nuclear power plant: 8% increase in maximum authorised power to 2,947 MW thermal, along with the associated modification to the safety analysis and operating technical specifications.
- Almaraz I and II and Vandellós II nuclear power plants: favourable reports on the use of weld overlay as a technique to reinforce the pressuriser nozzle welds.
- Cofrentes nuclear power plant: favourable report on a design modification and safety analysis of refuelling outages at BWR reactors, and corresponding change to the Operating Technical Specifications (ETF).
- Cofrentes nuclear power plant: approval of a Complementary Technical Instruction on Conditioned Application Standards.
- Cofrentes nuclear power plant: favourable report on a design modification for the use of GNF2 type fuel with a maximum pellet burnup of 45 MWd/kg U.
- Santa María de Garoña nuclear power plant: renewal of the operating permit for 10 years and report to the Ministry of Industry, Tourism and Trade on conditions associated with the renewal of the operating permit for periods of two, four or six years.

- Santa María de Garoña nuclear power plant: approval of Complementary Technical Instructions associated with renewal of the operating permit.
- Ascó nuclear power plant: favourable appraisal of the Organisational, Cultural and Technical Enhancement Plan (Procura).
- Trillo nuclear power plant: favourable report on the request for change of ownership from Unión Fenosa Generación S.A. to Gas Natural SDG, S.A.

Within the area of licensing activities, the intense work plan implemented over almost three years to support the report on the request for renewal of the operating permit of the Santa María de Garoña nuclear power plant has been particularly significant.

This plan has meant the evaluation of a Periodic Safety Review, the analysis of the Conditioned Application Standards, study of the integrated plan for ageing assessment and management and evaluation of the radioactive waste management plan associated with long-term operation. All the above has been set out in dozens of licensing assessments and inspections.

2.1.3. Monitoring and control

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

2.1.3.1. Inspection

A total 202 inspections have been performed at the six nuclear plants in operation (eight

groups). Of these, 121 corresponded to the Basic Inspection Programme (PBI) contemplated in the SISC, which during 2009 has included 97 inspections performed by the CSN specialists in different disciplines, plus those carried out by the resident inspectors and included in the 24 quarterly inspection reports. This has meant the performance of practically all the inspections scheduled in the PBI for 2009.

The remaining 81 inspections include the supplementary SISC inspections performed as a result of indicators or findings classified in categories higher than *green*, the reactive inspections performed due to operating incidents, the inspections of generic issues as a result of the new standards and in-house and industry operating experience and the inspections relating to licensing issues.

In particular, in 2009 the licensing inspection associated with the operating permit for the Santa María de Garoña nuclear power plant required the performance of 30 inspections and included the evaluation of the following aspects: in-house and industry operating experience, experience relating to occupational dose, experience relating to releases and public doses, experience relating to solid radioactive wastes, experience relating to environmental radiological surveillance, changes in the regulations and standards, equipment performance, in-service inspection, the qualification of equipment, lifetime management, compliance with the maintenance rule, design modifications and safety assessment and improvement programmes.

Likewise, the radioactive particle release incident that occurred at the Ascó I plant and that was reported in April 2008 has given rise to 13 inspections during the year for the tracking of the response actions scheduled.

2.1.3.2. Safety improvement programmes

The most important safety improvement programmes in force during 2009 were the following:

Periodic safety review programmes

2009 saw the completion of the periodic safety review of the Santa María de Garoña plant, associated with the renewal of its operating permit, and the continuation of the reviews of the Almaraz and Vandellós II plants, for the renewal of their operating permits in June and July 2010, respectively.

Generic issues

Generic issues are understood as being any safety-related problem identified at any domestic or overseas nuclear power plant that might affect other plants. The CSN monitors these issues and promotes the applicability analysis and adoption at the Spanish plants of the corrective actions resulting from such analysis.

The most relevant generic issues in 2009 have been the following:

- *Analysis of the incident at Vandellós II nuclear power plant involving seals that did not comply with the watertightness design criterion.*

Following the spraying of a series of cable trays during the testing of a fire-fighting station, a situation of inefficient tracking of the actual condition of the seals was identified, either since their initial implementation or following repair or modification.

The CSN has sent a complementary technical instruction to all the plants requiring them to draw up a manual on protection against internal flooding that

ensures the maintenance and control of the seals.

- *Analysis of the incident that occurred at Almaraz II nuclear power plant on April 19th 2009: failure of a control rod insertion logic relay that could have been avoided through analysis of the industry operating experience.*

The failure of a relay in the control rod drive system gave rise to an incident at Almaraz II, consisting of the uncontrolled insertion of a control rod bank and a flux difference higher than the established limit. The CSN concluded that this event could have been avoided if the plant had analysed correctly the industry operating experience, since the US Institute of Nuclear Power Operations (INPO) had described the way in which this type of relays should be maintained in order to prevent failures such as the one that occurred. The CSN will require all the plants to analyse the applicability of certain INPO operating experience documents.

- *Analysis of the incident that occurred at Ascó I nuclear power plant on May 23rd 2009: incongruence in the operating technical specifications (ETFs) in relation to the operability and setpoint value of safety valves.*

An incident involving the setting tolerance of the pressuriser safety valves being exceeded during a test proved to have been caused by a margin lower than that required –established in the applicable technical standards– having been erroneously incorporated in the ETFs. The CSN sent a generic letter to all the plants for the latter to verify the inclusion of the correct tolerance in their ETFs and to check the congruence of the corresponding safety analyses, reporting any discrepancies where appropriate in accordance with IS-10.

- *Analysis of the incident at Ascó nuclear power plant involving the inoperability of diesel generators as a result of manufacturing defects in the motor bearings.*

The possible presence of defects in the push rod header bearings of the emergency diesel generators, reported to Ascó by the manufacturer, forced the plant to declare these generators inoperable and, therefore, to shut down its two groups for replacement of the bearings belonging to the batches identified as being defective.

The CSN decided to treat this issue as generic and to address it in its operating experience inspections in order to ensure that the nuclear power plants are being informed of all defective components identified at other domestic or overseas plants.

Safety management improvement plan at Vandellós II (PAMGS)

The actions corresponding to the four PAMGS organisational and safety management programmes having all been completed, in 2009 the plan focussed on the verification of their efficiency.

This verification was carried out from 4th to 14th May by means of a mission to Vandellós II nuclear power plant, with the participation of 15 people specialising in this type of tasks from ANAV (Ascó-Vandellós Nuclear Association) and the companies Tecnatom, Betegon and Cuesta Asociados.

The process defined identified two differentiated activities that were to be carried out simultaneously to validate the efficiency of the PAMGS:

- Assessment of the impact of the PAMGS for correction of the diagnostic elements

identified as a result of the essential services water system (EF system) incident that occurred in August 2004. For this purpose the individual efficiency of each of the actions of the PAMGS organisational and management programmes was verified.

- Identification and prioritisation of the behaviours to be reinforced in order to ensure continued compliance with the PAMGS objectives once the plan has been completed. In this respect a behaviour reinforcement programme was put into place establishing additional barriers aimed at preventing events of the same kind.

At the end of 2009 the licensee was drawing up the PAMGS closure report, including the result of the process of verifying its efficiency. In addition, in this report the licensee will include the evaluation of the results of the IAEA's OSART Mission carried out between September 21st and October 8th 2009, and the results of the internal and external safety culture evaluations performed during development of the PAMGS.

The CSN has monitored these activities, attending two technical meetings with the licensee and carrying out two inspections.

As regards the design modifications deriving from the 2004 incident, the new safeguards cooling system was placed in service in 2009. For the CSN, the supervision of the detailed design of the project, its implementation and testing have meant the performance of 11 inspections.

Ascó Procura Plan

As a result of the incident involving the release of radioactive particles reported in April 2008, the Ascó nuclear power plant has been implementing various actions for the recovery and normalisation of the site, in addition

to its *organisational, cultural and technical reinforcement plan (Procura)*.

In September 2008, the CSN set up a committee to track the actions of the licensee, with a view to identifying the necessary supervision and inspection activities. This committee has held five meetings in 2009.

The status of the most important activities undertaken by the plant is as follows:

1. *Ascó I and II nuclear power plant fuel building ventilation system.*

Ascó has declared the radiological cleaning operations carried out on the ducts of the ventilation system of the fuel building of both groups to have been completed. The licensee will undertake an exhaustive radiological control of these systems until July 2012.

In addition, the licensee has submitted to the CSN a special programme for radiological surveillance inside the plant buildings and structures not subject to radiological surveillance, in compliance with the complementary technical instruction of July 30th 2009. The results conclude that the levels of radiation in the areas investigated do not exceed the environmental background values.

2. *Radiological status of the plant outdoor areas.*

Ascó has declared the site radiological monitoring and cleaning operations to have been completed, except in the case of areas covered with gravel, and has informed the CSN of the results, the latter carrying out an inspection in this respect in February 2009. As regards the management of gravels, these are being removed from the areas inside the double fence and transferred to another area of the site for their radiological control and

cleaning. This operation is expected to be completed by March 2010.

In response to another ITC (Complementary Technical Instruction) of July 30th 2009 on the performance of a special radiological surveillance programme on the site, Ascó has developed procedures for the final verification of the status of the site, including dynamic and static surveillance measures, which is expected to finish in June 2010. The results of the dynamic measures applied have not detected any significant contamination.

3. *Tracking of the Organisational, Cultural and Technical Reinforcement Plan.*

On July 1st 2009, the Council issued its favourable appraisal of the Procura plan, requiring the submittal of a new revision incorporating several improvements within six months.

On December 17th, revision 2 of the Plan was received. This responded to the conditions imposed by the CSN and was favourably judged by the Council.

The framework of the *Procura Plan* contemplates the analysis report on the recommendations included in the *Procura* diagnosis reports. This report integrates the recommendations of the root cause analyses performed using the MORT methodology and the actions to be implemented to address these recommendations.

During 2009 seven inspections have been performed for tracking of the plan with the programme of activities foreseen by Ascó in response to the particle release event and two for tracking of the Organisational, Cultural and Technical Reinforcement Plan (Procura) of the ANAV.

Nuclear power plant action plans for the period 2010-2014

In response to a request from the CSN, the licensees have updated the reports and forecasts submitted presented during the previous year, adapting them to the period 2010-2014. These reports contain the improvement plans and the investments foreseen for the maintenance and reinforcement of safety-related aspects, including technology updating, the maintenance of the facility, organisational improvements, personnel training, the analysis of operating experience, the renewal of equipment and staffing.

The analyses were submitted to the CSN in January 2010, with a view to being able to include the results for 2009, and during the months of February and March the Board of the CSN held meetings with each of the licensees to analyse the conclusions, the improvements proposed and the forecasts regarding the investments and resources required for their implementation.

2.1.4. Conclusions

The assessment of the results of the SISC, along with consideration of other aspects of the performance of the nuclear power plants, as set out in this section and in subsequent sections on radiological impact, allow it to be stated that during 2009 the Spanish nuclear power plants have operated correctly, within the safety limits established and without situations of undue risk.

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

This section includes the Juzbado fuel assembly manufacturing facility, the El Cabril radioactive waste disposal installation and the Centre for

Energy-Related, Environmental and Technological Research (Ciemat). During 2009 all these facilities have operated within the safety margins established without situations of undue risk.

Licensing

Throughout the year the CSN reported on 13 different authorisations. The following were among the proceedings dealt with:

- Juzbado fuel assembly manufacturing facility. Approval of revisions of the following official operating documents: operating technical specifications and emergency plan.
- El Cabril disposal facility. Authorisation of the plan for the clearance of overflows of hydraulic conglomerant and other similar waste materials generated at the facility and approval of a new revision of the security plan.
- Ciemat. Approval of a new revision of the security plan and authorisations relating to different 2nd category radioactive facilities at the centre: operation of IR-34, atmospheric contamination measurement laboratory, and modification of IR-17, conditioning of solid radioactive wastes and temporary stores for very low level wastes and cleared materials, IR-04, radiation biological effects laboratory, and IR-09, metallurgy laboratories.
- Juzbado, El Cabril and Ciemat. Extension of the respective authorisations for the performance of activities for the import, export, handling, processing, storage and transport of nuclear materials.

The CSN also granted the Juzbado facility and the El Cabril centre an extension to the term for compliance with the complementary

technical instruction issued to both installations on July 31st 2008 on the radiological surveillance of outdoor areas.

Inspection and control

In performing its respective control programmes, the CSN carried out a total 33 inspections: 11 at the Juzbado fuel assembly manufacturing facility, 12 at the El Cabril disposal facility and 10 at Ciemat.

Reportable events

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

- On March 5th 2009, rupturing of a fuel rod due to the mechanical failure of the positioning equipment for radiographic inspection, with the fracturing of a fuel pellet. The affected area was cordoned off, inspected and cleaned, a check was made to ensure the absence of contamination and the fragments of the affected pellet were picked up.
- On May 14th 2009, notification of discrepancies in the sampling factors used to calculate gaseous radioactive effluents in the ventilation and air-conditioning system discharge.

The licensee interrupted manufacturing activities in the areas involved pending the determination of the correct values, using these to adjust the affected extractors and requesting modification of the operating specifications to include the new sampling flows. Furthermore, a systematic safety system review programme has been put into force to rule out this type of discrepancies.

The El Cabril waste disposal facility reported three identical events during the year, these consisting of the following:

- Collection of a larger than established amount of water in the leachate drains network of very low level waste disposal cell 29. These events occurred as a result of heavy rain and did not imply any risk for the safety of the installation. A study is being made of means to prevent the repetition of this event in the future.

Sanctions and warnings

There have been none.

Relevant issues

Performance of the integrated plan for the improvement of the Ciemat facilities (PIMIC) continued during 2009. The year saw completion of the demolition work on the walls of the reactor building and the authorised release of liquid effluents from installation IN-01, completion also of the work for the characterisation and dismantling of the reactor building buried tanks and initiation of the backfilling of the cavities excavated following verification of the absence of contamination at depth. In addition, preparatory work has begun for decontamination of the area between buildings 13 and 53.

At El Cabril, work began in 2009 on the filling of cell 17 and the closure of cell 23, both located on the south platform. As of December 31st 2009, the total number of low and intermediate level waste packages stored on the north and south platforms was 110,476, this amounting to 61.61% of the total capacity, and the number of very low level waste disposal units was 1,718; 2.47% of cell 29.

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

The following fuel cycle nuclear or radioactive facilities have been definitively shut down or are in the dismantling and decommissioning phase: Vandellós I nuclear power plant, which is in the dormancy stage following the conclusion of the first stage of dismantling, José Cabrera nuclear power plant, which has been definitively shut down, the Elefante uranium concentrates plant, dismantled and in the period of compliance, the Quercus facility, shut down, the Andújar Uranium Mill (FUA), dismantled and in the period of compliance, and the Lobo-G plant, which has been decommissioned. Throughout 2009, the activities carried out at each of these facilities, depending on its status, have been performed within the safety limits established and without any undue impact for people or the environment.

Licensing

Throughout 2009, the CSN issued six reports and two favourable appraisals.

The following are among the most important proceedings dealt with:

- José Cabrera: extension of the authorisation for the performance of activities relating to the import, export, handling, processing, storage and transport of nuclear materials and approval of the security plan.
- José Cabrera: authorisation of a new revision of the authorisation for the clearance of oils and favourable appraisal of new revisions of the spent fuel pool cooling and containment isolation programmes.
- José Cabrera: authorisation of change of ownership of the plant to Gas Natural

SDG, S.A. and subsequent authorisation of the change of such ownership to Enresa and authorisation for dismantling of the facility.

- Quercus Plant: approval of new revisions of the site emergency plan and verification of the facility technical specifications, and favourable appraisal of the surveillance and maintenance plan.

Inspection and control

In the development of the respective control programmes of the facilities, the CSN carried out a total 27 inspections: three at the Vandellós I plant, 14 at the José Cabrera plant, three at the Quercus plant, one at the Elefante plant, four at the Andújar Uranium Mill (FUA) and two at the Lobo-G Plant.

Reportable events

On June 24th, the licensee of the Quercus plant reported on the inoperability of the fire-fighting system of the facility's transformer substation for the performance of repairs to this system. Operability was recovered without incidents following the repair.

Sanctions and warnings

There have been none.

Relevant issues

At all the facilities in the definitive shutdown, dismantling and decommissioning phase, the programmes for environmental radiological surveillance, the radiological protection of the workers, security and, if necessary, control of effluent releases and radioactive waste management are kept operative. There have been no deviations in the performance of any of these programmes during 2009.

On January 19th 2009, the programme of pre-operational testing of the Individual Temporary Storage (ATI) facility for spent

fuel at José Cabrera nuclear power plant, initiated in July of the previous year, was satisfactorily completed. From January 21st to September 3rd 2009, the 377 fuel assemblies stored in the plant spent fuel pool were transferred to their location in the ATI facility, in 12 HI-STORM dry storage casks. The transfer of the fuel was carried out without any significant incidents.

On the basis of the report referred to in the the section on licensing, on February 1st 2010 the Ministry of Industry, Tourism and Trade authorised the transfer of ownership of the José Cabrera plant to Enresa and the dismantling of the facility.

The two-year moratorium in the licensing of the dismantling of the Quercus plant remains in force. During this time the surveillance and maintenance measures established in the authorisation of this moratorium issued on July 15th 2008 continue to be applied, in order to

guarantee that the facility is maintained in a safe condition with a view to a possible renewal of activities.

2.4. Radioactive facilities

Throughout 2009, the operation of the scientific, medical, agricultural, commercial and industrial radioactive facilities took place in accordance with the safety standards established, the measures required for the radiological protection of persons and the environment being complied with.

Licensing

The licensing of these installations is performed by the CSN in collaboration with the autonomous communities with which the Council has signed function assignment agreements.

In 2009 a total 362 reports were issued on radioactive facilities:

Table 3. Evolution of the number of radioactive facilities

Category	Field of application	2005	2006	2007	2008	2009
1 ^a	Irradiation	1	1	1	1	1
	Subtotal	1	1	1	1	1
2 ^a	Commercialisation	49	46	51	53	53
	Research and teaching	84	80	85	89	102
	Industry	600	582	597	604	586
	Medicine	276	287	309	315	320
	Subtotal	1,009	995	1,042	1,061	1,061
3 ^a	Commercialisation	12	13	14	15	17
	Research and teaching	90	89	95	95	94
	Industry	145	152	157	156	165
	Medicine	66	57	52	51	49
	Subtotal	313	311	318	317	325
	Medical X-rays	25,222	25,902	28,438	29,714	30,475
	Total	26,545	27,209	29,799	31,093	31,862

- 55 for operating permits.
- 46 for decommissioning declarations.
- 261 for authorisations for different modifications.

Inspection and control

As in the case of licensing, the inspections are carried out in collaboration with the autonomous communities with which the Council has signed function assignment agreements. Throughout 2009 a total 1,741 inspections were performed at radioactive facilities, distributed as follows by types:

- 141 inspections associated with licensing.
- 1,269 radioactive facility control inspections.
- 304 radiodiagnosis facility control inspections.
- 27 inspections relating to incidents, complaints or irregularities.

In addition to the inspections, the control of the facilities rests on the review of periodic reports. In 2009 the CSN received 1,091 annual reports from radioactive facilities and around 22,500 diagnostic X-ray installations, along with 260 quarterly commercialisation reports.

The results of the inspections, along with the analysis of the annual reports from the facilities, the information on radioactive equipment and materials supplied by the commercialisation installations and the data on radioactive waste management provided by Enresa, gave rise to the issuing of 408 control letters.

Also noteworthy among the control activities is the response to complaints, of which there were 18 in 2009. In the majority of these cases an

inspection visit was made and the complaining parties were informed of the results.

Events and incidents

During 2009 twenty incidents were registered at radioactive facilities, five attributable to operational failures, nine to equipment failures, three to the theft or loss of radioactive equipment or sources and three to fires at the facility or in the surrounding area.

Sanctions and warnings

In 2009, the CSN proposed the initiation of six sanctions proceedings to the competent authority. The causes habitually leading to sanctions proposals have been the performance of activities requiring authorisation without such authorisation having been granted, the operation of the installations by non-licensed personnel and the non-observance of the instructions and requirements imposed.

Likewise, as a result of the facility assessment and inspection activities the CSN issued 82 warnings, identifying the deviations encountered and requiring their correction.

Relevant issues

In July 2009 a new Regulation on the installation and use of X-ray apparatus for medical diagnosis purposes was approved, updating Royal Decree 1891/1991 but maintaining its basic approach.

The following are particularly noteworthy among the novelties introduced: the detailed regulation of the radiological protection technical units and services operating in the area of medical radiodiagnosis, classification of these facilities on the basis of risk and appropriate grading of requirements and the demand for a radiological protection programme specific to each installation.

As part of its standards-related function, the CSN has continued to issue circulars and complementary technical instructions to the licensees of radioactive facilities clarifying and interpreting standards and disseminating good practices. In 2009 the emphasis has been on the maintenance of soil humidity and density measuring equipment, the requirements regarding the use of homologated equipment for the X-ray inspection of packages, the operational requirements and arrangements applicable to the import and export of high activity scaled radioactive sources and good practices in the industrial gammagraphy sector.

In the wake of the implementation tests performed throughout 2009 in relation to the INES Scale for the classification of events at radioactive facilities, in November 2009 the CSN approved a working programme for its application during the early months of 2010. The objective of the scale is fast and coherent reporting to the public of the impact for safety of events and incidents at such facilities.

Particularly significant among the tasks performed by the CSN in 2009 in relation to industrial radioactive facilities is the start-up of the second phase of the Alba Synchrotron. When it reaches its final stage, the Alba project will be a first category radioactive installation, although the process of assessment is being addressed in stages. In December the facility was authorised to carry out tests for the fine-tuning of the assembly: a linear accelerator injecting accelerated electrons at 100 MeV into a circular accelerator, via the transfer line, the objective being to accelerate these electrons to speeds close to the speed of light, thus achieving very high energy electrons (3 GeV).

Different specialist areas of the CSN have participated in evaluating this project, along with

the SCAR (Service for the Coordination of Radioactive Activities), all under the coordination of the CSN's industrial radioactive facilities area. The process of authorising the complete facility is scheduled for 2010, the aim of the installation being research in different fields of science, industry and medicine. The Alba facility is the first of its type authorised in Spain, for which reason the assessment procedures have been developed using the experience of other European countries and of the United States of America as a basis.

2.5. Transport of nuclear and radioactive materials

In the area of licensing of transport activities, in 2009 the CSN reported on the following proceedings: five for the validation of approval certificates for waste packages of overseas origin and one for revision of an approval certificate of Spanish origin, two security authorisations for the transport of nuclear materials, one for a specific shipment and the other for the revision of the general authorisation of a transporter, authorisation under special conditions for the transport of a radioactive source of Cobalt-60 and, finally, a proposal regarding the reduction of coverage of nuclear risk for a shipment of nuclear substances.

During 2009, 66 inspections were performed on nuclear materials shipments, 19 by the CSN itself and 47 by the autonomous communities with functions assignment agreements. This type of control is completed with analysis of the notifications and of the performance reports required by the CSN for the transport of fissile materials, high level radioactive sources and wastes. During the year those referring to 80 shipments of fissile materials and 248 shipments of radioactive wastes

carried out by Enresa were analysed, the latter involving 202 shipments from nuclear facilities and 46 from other installations.

In 2009 five incidents were registered in the transport of radioactive material: one road accident without damage to the radioactive packages, the mislaying of two packages containing I-123 for medical use, of low risk because of its short lifetime, during transport by air, one of these being recovered and the other not, the theft of a vehicle carrying radioactive soil density measuring equipment, which was not recovered, and the return to the supplier of a package containing a radioactive source due to the detection of activity on the packaging attributable to radioactive contamination in its interior, the possibility of any risk in handling being ruled out.

2.6. Manufacturing of radioactive equipment and exemptions

During 2009 the CSN issued two reports authorising the manufacturing of radioactive equipment, relating to six models of devices for the inspection of packaging.

It also reported on 13 proceedings for the type approval of radioactive apparatus, this implying the exemption of 22 models from consideration as radioactive installations because of their safety; all these were equipped with X-ray generators except one that incorporated a source of Ni-53.

2.7. Service entities

This section encompasses those companies or entities that are subject to nuclear regulation and that render services to third parties in the field of radiological protection. It includes radiological protection services (SPR),

radiological protection technical units (UTPR), companies selling and providing technical assistance for medical X-ray equipment, personal dosimetry services (SDP) and registered external companies.

The following activities and issues were particularly noteworthy during 2009:

- The CSN requested the implementation of three new SPR's, authorised one and closed another. It also authorised three new UTPR's and modified the authorisation of two that has been authorised previously.
- 22 inspections were performed on SPR's and 23 on UTPR's, these being carried out in collaboration with autonomous communities having functions assignment agreements.
- As a result of inspection and control activities, sanctions proceedings were proposed with respect to two UTPR's, and another was temporarily suspended for safety reasons.
- At present, 72 SPR's and 48 UTPR's are authorised. Of the latter, 26 render their services exclusively in the field of radiodiagnosis facilities.
- The UTPR Forum, set up in 2008 in collaboration between the CSN and the Spanish Radiological Protection Society, has had two working groups active during 2009, one on the human and technical resources to be available to the UTPR's and the other for the drawing up of a type contract for the rendering of services to medical X-ray facilities.
- The CSN authorised 16 new sales and technical assistance companies, modified the authorisations of five, closed three and

rejected three requests. At the end of 2009 a total 296 entities held this authorisation.

- The temporary suspension of the authorisation of the external personal dosimetry service of Vandellós II nuclear power plant was authorised.
- Four inspections were carried out within the programme for the control of the 31 authorised dosimetry services, 22 external and nine internal.
- As of December 31st 2008, a total 1,369 companies were included on the register of external companies, the vast majority of these carrying out their activities in relation to the nuclear power plants.

2.8. Personnel licences

As of December 31st 2009, the number of licensed workers stood at 10,914; 3,126 holding a supervisor licence, 7,788 licensed as operators and 180 with a radiological protection service manager diploma. Furthermore, 41,005 workers were accredited by the CSN to manage medical radiodiagnosis facilities and 57,678 to operate such installations.

In 2009 the CSN granted the following licences and accreditations:

- At nuclear power plants, seven supervisor licences, 33 operator licences and one radiological protection service manager licence, along with the extension of 41 operator licences and 64 supervisor licences.
- At fuel cycle and disposal facilities and installations in the dismantling phase: 10 supervisor licences, 10 operator licences and one radiological protection service manager

licence, along with the extension of 11 supervisor licences and 16 operator licences.

- At radioactive facilities: 434 new supervisor licences, 1,223 operator licences and 12 radiological protection service manager licences, along with the extension of 147 supervisor licences and 451 operator licences.
- At medical radiodiagnosis facilities: 504 accreditations to manage such installations and 1,778 for their operation.

As regards courses to obtain licences and accreditations, the CSN homologated three new courses for radioactive facilities and authorised the modification of one that had been homologated previously. Also homologated were five new courses for the accreditation of the personnel of X-ray facilities, and nine other courses already homologated were modified.

The control of course delivery and of the corresponding examinations gave rise to the performance of 103 inspections.

The CSN keeps updated sufficient educational material for the courses aimed at the acquisition of licences and accreditations in all the fields of application of the radioactive and radiodiagnosis facilities, and makes this material available on its corporate website.

2.9. Uranium mining

In view of the proliferation of requests for the prospecting, investigation and exploitation of uranium ores, in March 2009 the CSN informed the autonomous communities of Castilla y León, Castilla-La Mancha, Catalonia and Extremadura of the mandatory nature of the Council report on radiological protection

prior to the granting of any permit for such activities.

During 2009 the CSN reported on 55 such requests, 34 corresponding to the Autonomous Community of Castilla y León, eight to Castilla La Mancha and 13 to Extremadura.

During 2009 several mining sites in Salamanca holding investigation permits issued by the Regional Government of Castilla y León were inspected.

2.10. Favourable appraisal of designs, methodologies, models or verification protocols

By agreement reached on June 24th 2009, the CSN favourably appraised the request issued by Almaraz nuclear power plant regarding a new methodology for the evaluation of large break accidents affecting the reactor coolant circuit.

2.11. Other regulated activities

As of December 31st 2009, 35 companies were authorised for the activities included in title VII of the Regulation on Nuclear and Radioactive Facilities and referring to the following: the addition of radioactive substances in the production of consumer goods, the import, export, commercialisation and transfer of radioactive materials, radiation generating

equipment and consumer goods incorporating radioactive substances and technical assistance for such equipment and goods.

During 2009 reports were issued regarding 12 new authorisations for the performance of these activities and two requests were filed.

2.12. Activities at non-regulated facilities

Transfers to Enresa

During 2009 the CSN dealt with seven proceedings authorising the transfer to Enresa of different non-authorised radioactive materials and sources. In five of these cases the requesting party did not have a radioactive facility.

Removal of radioactive material detected in metallic materials

In 2009 the CSN was informed on 71 occasions of the detection of radioactivity in metallic materials, within the framework of application of the *Protocol for collaboration in the radiological surveillance of metallic materials*. The radioactive sources detected, which included indicators with radioluminescent paint, ion smoke detectors, radioactive lightning rods, pieces of uranium, products containing radium and thorium and contaminated parts, were transferred to Enresa for management as radioactive wastes.

As of the end of 2009, the number of metallurgical facilities subscribing to the protocol amounted to 148.

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

3.1. Radiological protection of the exposed workers

The number of workers professionally exposed to ionising radiations and dosimetrically controlled in Spain in 2009 amounted to 103,671. The collective dose corresponding to the workers overall stood at 27,349 mSv.person. Considering only the significant doses and excluding potential cases of the annual dose limit being exceeded, the individual average dose of these workers amounted to 0.88 mSv/year. In both of these cases the administrative doses assigned and deriving from the dosimeter not having been reset are not counted.

99.34% of the dosimetrically controlled workers received doses lower than 6 mSv/year, and 99.97% received doses lower than 20 mSv/year.

This distribution underlines the positive trend of the doses at the Spanish nuclear and radioactive facilities with respect to compliance with the legally established dose limits for professionally exposed workers (100 mSv over five years).

On closure of the 2009 dosimetry year, a total of approximately 15,672,000 dosimetry measurements were registered at the National Dosimetry Bank, these corresponding to some 285,000 workers and some 59,900 facilities.

Throughout 2009, the CSN distributed a total 5,299 radiological work permits for the workers of 303 companies.

Analysis of the data set out above underlines the following:

- The greatest contribution to the collective dose of the country's professionally exposed workers in general corresponds to the medical radioactive facilities, with 53% of the overall collective dose, since the number of exposed workers in the sector represents 77% of the total.
- At the nuclear power plants the value of the average individual dose was higher than that of the previous year, this being due to the fact that in 2009 all the nuclear power plants except Ascó II had a refuelling outage. As is habitual, the contracted personnel presented higher values than the fixed members of the workforce: 2.02 mSv/year compared to 1.20 mSv/year, a situation analogous to that existing in other countries.
- As regards the three-year period 2007 to 2009, a slight increase may be observed in the average collective dose per reactor in the case of PWR (pressurised water reactor) plants, although the values are lower than those for the same type of plants in other countries in our setting.
- During this same three-year period (2007-2009), the BWR (boiling water reactor) plants had occupational doses higher than those registered in Europe, and similar to those obtained during the previous three-year period. This value was penalised by the the high value registered during the refuelling outage at Cofrentes nuclear power plant in 2007 as a result of the replacement of piping in the control rod drive system (CRDH).
- As in previous years, the highest average individual dose was that received by workers

Table 4. Doses received by professionally exposed workers in each of the sectors considered in the annual report for 2009

Facilities	No of workers	Collective dose (mSv.person)	Average individual dose (mSv/year) (*)
Nuclear power plants	9,360	8,973	1.92
Fuel cycle and waste disposal facilities and research centres	1,204	87	0.51
Radioactive facilities			
Medical	80,341	14,386	0.65
Industrial	7,784	2,965	1.15
Research	5,489	475	0.37
Facilities in the dismantling and decommissioning phase	292	245	1.77
Transport	112	219	2.61

(*) The calculation of the average individual dose considers only those workers who have had dosimeter readings above the background value.

in the transport sector (2.61 mSv/year), this being concentrated on the road transport of radiopharmaceutical products. The high 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 a small number of workers leaves little margin for significant dose reductions to be achieved, despite the special monitoring of the sector by the CSN.

During 2009 there were eight cases of the annual regulatory dose limits for workers being exceeded. All of these occurred at radioactive facilities and are being investigated in accordance with the procedure established.

3.2. Control of releases and environmental radiological surveillance

Control of effluents

The radioactive releases from the facilities during 2009 remained within the habitual values and are comparable to those registered at other European and American facilities, as is shown by

the surveillance and the registers carried out. As in previous years, the calculated doses attributable to these releases were far below the regulatory dose limits for the public and represent a small fraction of the release limits. In the specific case of the nuclear power plants this fraction does not exceed 3.5% of the 100 micro-Sievert/year dose restriction established.

Radiological surveillance in the vicinity of the facilities

The processing and analysis of the samples taken within the framework of the environmental radiological surveillance programmes (PVRA) implemented in the areas surrounding the nuclear an fuel cycle facilities and installations in the shutdown and dismantling phase implies a lag of more than six months before the results are obtained, for which reason this report refers to data for the year 2008.

During the environmental radiological surveillance programmes for 2008, 6,563 samples were taken in the vicinity of operating nuclear power plants, 2,100 from the areas

surrounding fuel cycle facilities and 2,155 from around installations in the shutdown, dismantling and decommissioning stage, including the José Cabrera and Vandellós I nuclear power plants.

The results of the PVRA in 2008 are similar to those obtained in previous years and, from a radiological point of view, reflect a correct environmental quality around the facilities.

With a view to verifying that the PVRA of the facilities are correct, the CSN performs

independent environmental radiological surveillance programmes (PVRAIN), the sample volumes and determination of which represent 5% of the corresponding PVRA. The performance of these programmes is undertaken by university environmental radioactivity laboratories contracted by the CSN (six) and the autonomous communities with this function assigned for the facilities in their respective territories: Catalonia (two) and Valencia (two). In 2008 the results of the PVRAIN do not show any significant deviations with respect to those obtained in the respective PVRA.

Table 5. Standardised activity of radioactive effluents at nuclear power plants (GBq/GWh)*. 2009

	Gaseous radioactive effluents				Liquid radioactive effluents	
	Components				Components	
	Noble gases	Halogens	Particles	Tritium	Total except tritium	Tritium
PWR plants	5.16 10 ⁻¹	3.13 10 ⁻⁵	9.81 10 ⁻⁷	1.82 10 ⁻¹	7.17 10 ⁻⁴	3.03 10 ⁰
BWR plants	2.11 10 ⁰	1.02 10 ⁻³	1.07 10 ⁻³	2.29 10 ⁻¹	5.19 10 ⁻⁵	1.27 10 ⁻¹

(*) Average values: 2000 - 2009.

Table 6. Fuel cycle facilities and installations in the definitive shutdown, dismantling and decommissioning stage. Activity of liquid and gaseous effluents (Bq). 2009

Effluents	Fuel cycle facilities			Installations in shutdown and dismantling phase			
	Juzbado	El Cabril	Ciemat	Quercus	Vandellós I (2)	José Cabrera	
Liquid effluents	2.09 10 ⁷	(1)	7.51 10 ⁷	1.92 10 ⁷	Except tritium Tritium	3.18 10 ⁵ 2.78 10 ⁷	6.73 10 ⁷ 2.57 10 ¹¹
Gaseous effluents	7.38 10 ⁴	Total alpha Total beta Gamma Tritium C-14	8.16 10 ³ 1.17 10 ⁵ LDL 4.55 10 ⁹ 1.62 10 ⁹	LDL	(3)	Particles Tritium C-14	LDL 6.55 10 ⁹ —
Calculated radiological impact	<1% of the dose restriction established	9.63% of the dose restriction established	<1% of the dose restriction established	<1% of dose restriction established			

(1) Zero release facility.

(2) Emissions due to occasional venting of the shroud and specific characterisation operations.

(3) As a result of activities having ceased, no gaseous effluents are generated.

Table 7. PVRA. Number of samples taken by the nuclear power plants in 2008

Type of samples	Garroña	Almaraz	Ascó	Cofrentes	Vandellós II	Trillo
Atmosphere	782	778	811	768	819	766
Water	188	212	136	142	131	140
Foodstuffs	152	318	106	84	92	138
Total	1,122	1,308	1,053	994	1,042	1,044

Special radiological surveillance programme at Ascó I nuclear power plant

The radioactive particle release event that occurred at Ascó I, AS1-127 in 2007, required the performance of a specific radiological surveillance programme that lasted throughout 2008 and 2009 and that consisted of the following:

- A direct radioactivity measurement campaign in the vicinity of the plant by the Ciemat mobile environmental surveillance unit (UMA) in 2008.
- The bringing forward of the collection and analysis of certain samples corresponding to the plant PVRA and the PVRAIN of the Regional Government of Catalonia for 2008.
- A complementary surveillance campaign in off-site areas by the Ciemat UMA following the radiological normalisation of the site in 2009.

The search campaigns did not detect the presence of new active particles and the PVRA analyses have not shown any increase in radiological activity in the area, which would be coherent with the characteristics of the emission that occurred.

In short, and in view of the results obtained, the special surveillance of the Ascó plant in relation to this event may now be considered to have been completed.

Radiological surveillance in the rest of the national territory

The CSN also controlled the environmental radiological quality of the entire national territory through its measurement networks: the automatic stations network (REA), which continuously measures the presence of radiation in the atmosphere at 25 locations throughout the country, and the sampling stations network (REM), which is made up of a total 20 laboratories that analyse samples of waters from rivers and coasts, the atmosphere, the terrestrial medium and foodstuffs. The REM operates in two different ways: the so-called dense network, which analyses a large number of samples at many different locations throughout the country, and the spaced network, which deals with few samples but with a high level of accuracy. The values obtained are similar to those of previous years and reflect a correct radiological situation.

Procedure comparison and standardisation campaigns

With a view to guaranteeing the homogeneity and reliability of the results obtained from the different environmental radiological surveillance programmes, and given that numerous laboratories participate in their performance, the CSN carries out periodic comparisons with these laboratories and promotes working groups for the standardisation of the environmental radioactivity sampling and measurement procedures.

During the period 2008-2009, an exercise was carried out for the determination of radionuclides of natural origin in a preparation of phosphogypsum from the ponds of the company Fertiberia S.A. in Huelva, with the participation of 32 national and two overseas laboratories. The exercise, which concluded in October 2009, pointed to the homogeneity of the results and the high percentage of correct determinations and, therefore, to the suitability of the participants for this type of analysis.

Particularly significant as regards standardisation was the publication in 2009 of two procedures in the environmental radiological surveillance series of the CSN's collection of technical reports.

Specific radiological surveillance programme in the Palomares area

This programme, a result of the military air accident involving the dispersion of plutonium that occurred in 1966, is performed by Ciemat with support from the US Department of Energy. The objective of the programme is the detection and monitoring of possible internal contamination of persons and the measurement and trending of residual contamination in the soil.

The results of the programme for the monitoring of persons indicate that the accident has had no effects on the health of the inhabitants of the Palomares area.

The updated consideration of economic, social and town planning factors has in recent years determined a more accurate radiological characterisation of the affected zones, along with government actions informed by the CSN, translating into the expropriation of certain plots, the temporary occupation of others and the establishment of certain restrictions on use in some cases.

In 2009, the Ciemat completed a study that involved the updated three-dimensional radiological characterisation of Palomares, including assessment of the volume of land contaminated. Likewise, in response to a request from Ciemat, the IAEA performed an international review of this characterisation, endorsing in its report the design, methodology and procedures used and underlining their compliance with the applicable international standards.

The aforementioned study will serve as a basis for a plan for the rehabilitation of the area in keeping with title VI of the Regulation on the Protection of Health against Ionising Radiations, which will need to be informed by the CSN.

3.3. Protection against natural sources of radiation

Compliance with title VII of the *Regulation on the protection of health against ionising radiations*, and with the criteria set out for its development by the CSN in the resolution issued on October 31st 2007, imposes upon the licensees of activities involving natural radiation sources the obligation to carry out a study of the radiological impact of such activities on the workers and the public. In order to map out this obligation and channel its compliance, the CSN set up a series of pilot studies on significant industrial activities, carried out by different universities and scientific organisations.

In 2009 a study on the radiological impact of coal-fired thermal plants undertaken by Ciemat and the University of Extremadura was completed, along with another on the concentration of various radionuclides in mineral, mining-medicinal, spring and drinking

waters in Galicia by the University of Santiago de Compostela, and the project for the measurement of radon gas in homes in Galicia, also performed by the University of Santiago, came to an end.

Along these same lines, collaboration agreements have been signed with three universities and aids have been granted to the R&D programmes of four others for the continued development of programmes for protection against radon.

Furthermore, during 2009 the CSN continued to inform different authorities on the control of exposures due to natural radiation in specific activities:

- The Regional Government of Catalonia on the process of eliminating bicalcium phosphate manufacturing wastes contaminated with natural radioisotopes from the Flix reservoir.
- The Regional Government of Murcia on the removal of wastes contaminated with natural radioisotopes arising from the exploitation of phosphorite for recovery of the El Hondón area in Cartagena.
- The Ministry of Industry, Tourism and Trade on protection against radiations in the operation of the Casablanca oil platform off the coast of Tarragona.
- The Ministry of the Environment and Rural and Marine Habitats on the restoration of the phosphogypsum pools contaminated with natural radioisotopes in the Huelva ria, as a result of the manufacturing of fertilisers by Fertiberia.

Finally, in September 2009 the Directorate General for Energy and Transport of the

European Commission made a verification visit to the phosphogypsum pools of the Huelva ria and to the area contaminated with Cs-137 at the Inert Products Recovery Centre (CRI-9) located therein. The aim of the visit was to check for compliance with Spain's commitments under article 35 of the Euratom Treaty. The final report of the verification team, submitted in 2010, concludes that the radiological studies and surveillance programmes established are adequate and efficient.

3.4. Epidemiological survey

On request by the Congress, by virtue of the motion of December 9th 2005, the CSN and the Carlos III Institute of Health (ISCIII) of the Ministry of Science and Innovation have in recent years been carrying out a joint epidemiological survey on the possible effects of the radiations emitted by nuclear facilities on the health of the population in the vicinity.

During 2009 the CSN has completed estimates of the doses of artificial and natural origin in all the municipal areas included within the scope of the survey and the ISCIII has concluded its analysis of mortality as a result of cancer in its geographical areas. This brings to an end the work involved in the survey and what now remains is its presentation to Congress and the dissemination of its results. With a view to addressing this last phase, a modification to the collaboration agreement between the CSN and the ISCIII has been signed, extending the period of validity until October 2010.

In April 2010 the Ministry of Public Health and Social Policy submitted the final report and the results of the epidemiological survey to Parliament. The main conclusions of the survey are as follows:

- The estimated accumulated doses that the population in the survey areas will have received as a result of the operation of the facilities are very small and far below those that, in the light of current scientific knowledge, might be related to effects on the health of persons.
- No consistent results have been detected showing any effect of increased mortality due to different types of cancer associated with the exposure of persons to ionising radiations as a result of the operation of the facilities. Certain specific dose-response associations have been found that it has not been possible to attribute to exposure as a result of operation of the facilities.
- Neither has it been possible to detect statistically significant increases in cancer mortality due to natural radiation.

3.5. Radioactive waste

Management of irradiated fuel and high level radioactive waste

During 2009, the CSN has continued to control the management of the spent fuel and high level radioactive waste or special radioactive waste stored at the Spanish nuclear power plants.

The number of irradiated fuel assemblies stored at the nuclear power plants as of December 31st 2009 was 12,070, of which 5,441 corresponded to boiling water reactor (BWR) plants and 6,629 to pressurised water reactor (PWR) plants. Of these assemblies, 11,315 are to be found in the storage pools of the plants and the remaining 755 in the individual temporary storage (ATI) facilities at the Trillo (18 casks) and José Cabrera (12 casks) plants.

The inventory of irradiated fuel and the situation of the nuclear power plant storage facilities are shown in table 8.

During 2009 the spent fuel pool at the José Cabrera plant was emptied and all the fuel assemblies were loaded into the plant's ATI casks. The operation, carried out between January and September, was supervised by the CSN, which performed three inspections.

The remodelling of the east fuel pool at Cofrentes nuclear power plant was completed and more compact racks were installed, increasing the storage capacity by 1,218 positions. As a result, the date of saturation of the pool was delayed from 2009 to 2021.

The inventory of spent fuel and the operating conditions of the nuclear power plant storage pools and ATI facilities were controlled, with three specific inspections being performed at Almaraz, Cofrentes and José Cabrera.

In October, the CSN reported favourably on a request from Trillo nuclear power plant to be allowed to store fuel with a degree of burnup of up to 49,000 MWd/tU in its ATI casks for a minimum cooldown period of nine years.

Finally, in 2009 the CSN published its instruction IS 20, which establishes the safety requirements applicable to spent fuel storage casks.

Management of low and intermediate level radioactive waste

The low and intermediate level radioactive waste generated at the nuclear and radioactive facilities is managed at the El Cabril disposal facility, which has 28 disposal cells for this purpose.

Table 8. Inventory of irradiated fuel at the Spanish nuclear power plants and situation of the corresponding storage facilities at the end of 2009

	José Cabrera	Garoña	Almaraz I	Almaraz II	Ascó I	Ascó II	Cofrentes	Vandellós II	Trillo	
	ATI (1)								Pool	ATI
Assemblies stored	377	1,972	1,204	1,132	1,100	1,016	3,469	908	514	378
Degree of occupation	100 (3)	89.27	73.10	68.73	87.03	80.38	67.85	63.19	81.85	22.50
Year of pool saturation	N/A	2015	2021	2022	2013	2015	2021	2020	N/A (2)	2040

(1) The plant is in the definitive shutdown condition. The fuel assemblies have been transferred to the ATI facility.

(2) The problem of pool saturation is not contemplated because of the availability of an ATI facility.

(3) The ATI facility at the José Cabrera nuclear power plant is capable of housing 16 casks, 12 for spent fuel and four for special wastes. Consequently, as regards spent fuel the degree of occupation has reached 100% of the capacity foreseen for this purpose.

In 2009 the El Cabril facility received 6,122 waste packages or containment units, plus 17 samples of low and intermediate level radioactive wastes:

- 4,254 packages and 17 samples from nuclear facilities.
- 1,868 packages or containment units from radioactive facilities.

In 2009 the operating nuclear power plants generated radioactive waste of this type entailing an estimated activity of 31,546.72 GBq, conditioned in 3,400 packages.

Within the facilities the CSN maintained control over the radioactive waste treatment and disposal systems and of the type package acceptance processes. During 2009 three inspections were carried out in this area at the nuclear facilities.

Also subject to monitoring by the CSN was the management by Enresa of atypical radioactive waste. This category includes the non-authorised radioactive substances and contaminated metallic materials mentioned in section 2.12, as well as radioactive lightning rods, 42 of which were removed in 2009.

Table 9. Nuclear power plants. Radioactive waste packages generated and shipped to El Cabril in 2009 and packages stored on site, equivalent to 220-litre drums (December 2009)

Facility	Conditioned activity (GBq)	Packages generated	Packages removed	Packages stored
José Cabrera	9,152.89	488	791	662
Sta. M ^a Garoña	2,958.65	374	586	4,109
Almaraz I y II	9,237.02	597	525	7,427
Ascó I y II	4,082.20	451	477	2,783
Cofrentes	5,989.77	1,069	929	8,201
Vandellós II	38.37	235	246	1,203
Trillo	87.83	186	360	609
Totals	31,546.73	3,400	3,914	24,994

As regards very low level waste, the CSN has continued its surveillance of operations at the east platform at El Cabril, as well as of the management of tailings from the uranium concentrates plants and the restoration of uranium mines. Two inspections have been performed in this area at the mining site at Saelices el Chico (Salamanca).

On February 26th 2009, the CSN issued its favourable appraisal of the updating of the common project on the declassification of oils at the nuclear power plants.

3.6. Emergencies and security

3.6.1. Emergencies

Participation in the national emergency response system

The CSN coordinates and collaborates with the other members of the national emergency response system, especially with the Directorate General for Civil Defence and Emergencies (DGPCE) and the Government delegations and sub-delegations in provinces housing nuclear facilities, as well as with the autonomous communities and the Military Emergency Response Unit (UME). In addition, it contributes to this system with its Emergency Response Organisation (ERO) and is responsible for Spain's participation in international organisations and agreements relating to this matter.

The following activities have been particularly outstanding in this area in 2009:

- The conclusion of the basic planning Guideline on civil defence against radiological risks, in collaboration with the DGPCE; the final arrangements for approval are currently on-going, the favourable report

from the National Commission for Civil Defence having been obtained.

- The setting up of a working group comprising the DGPCE, the CSN and the sub-delegations of the Government in provinces housing nuclear power plants for the development of programmes for the training and preparation of those required to intervene, information for the population and exercises and drills.
- Approval of the Collaboration Agreement between the CSN and the UME of the Ministry of Defence on planning and preparation for and response to nuclear and radiological emergencies, signed in early 2010.
- Delivery of the third edition of the general training course for those required to intervene in nuclear emergencies, with support by the National Civil Defence College of the DGPCE, and the first edition of the practical course on interventions in radiological emergencies.
- Collaboration in the drawing up of procedures and the development of courses for the training of NRBC specialists belonging to units reporting to the Ministry of the Interior (Guardia Civil and National Police) and the Ministry of Defence.
- Spanish participation and coordination in the performance of three European Union Ecurie exercises and three International Atomic Energy Agency Convex exercises.

The maintenance of the Emergency Response Organisation implied the following during 2009:

- The permanent operability of the CSN's Emergency Room (Salem), 24 hours a day, every day of the year.

- The permanent capacity to intervene in situ in the event of a nuclear or radiological emergency, by means of immediate response technical teams.
- Availability of mobile environmental radiological surveillance units for environmental contamination and radiation measurements in areas potentially affected by nuclear or radiological emergencies, for them to intervene at any point in the national territory.
- In 2009 the CSN delivered 3,000 direct reading electronic dosimeters and 28 reading units for use by those intervening in the five off-site nuclear emergency plans.

Regulatory and standards-related activities

The following activities were particularly significant in this area during 2009:

- CSN report on the draft Royal Decree for Modification of the Basic Nuclear Emergency Plan (Plaben).
- Favourable CSN report on the nuclear emergency master plans of the provinces of Burgos (Penbu), Cáceres (Penca), Guadalajara (Pengua), Tarragona (Penta) and Valencia (Penva, following approval of the new Plaben, Royal Decree 1428/2009).
- Performance of the mandatory site emergency drills at all the nuclear power plants and facilities, except José Cabrera, under the supervision of the CSN. The José Cabrera drill will be carried out in 2010 once ownership has been transferred to Enresa.

Incidents

During 2009 two emergency pre-alert notifications were received at the Salem, both from the Cofrentes nuclear power plant:

- On January 10th 2009, due to the opening of a primary circuit relief and safety valve. The Salem was not activated in view of the short duration of the event (six minutes).
- On October 25th 2009, also due to the opening of a primary circuit relief and safety valve. The emergency stand-by team was activated as a preventive measure and the event was reported to the Delegation of the Government in Valencia and to the national authorities.

In both these cases the plant safety systems responded as expected and the events had no impact on the workers or the environment.

The Salem is the channel for the entry of reports on events required by the international agreements and also, given its operability and means of communication, for the majority of the national notifications relating to events and incidents at nuclear and radioactive facilities and in transport. As regards the first, three notifications were received from the IAEA, the most significant being that arriving on August 11th and referring to a 6.6 magnitude earthquake at the Hamaoka nuclear power plant (Japan), without consequences, and three Ecurie communiqués, the most relevant referring to a loss of heat sink event at Cruas nuclear power plant (France), this being classified at level 2 on the INES Scale.

As regards national incidents, in 2009 the Salem received 27 notifications, 18 relating to radioactive facilities, four to the transport of radioactive substances and five to detections of uncontrolled radioactive material.

3.6.2. Security of nuclear materials and facilities

In 2009 the CSN carried out the following activities, among others:

- The draft Royal Decree establishing measures for the protection of critical Spanish infrastructures was informed, this being a transposition of the European Union Directive on the protection of critical infrastructures.
- The draft Royal Decree updating Royal Decree 158/1995 on the Security of Nuclear Materials was received for reporting. This draft was drawn up by an interministerial working group in which the CSN has participated actively.
- Throughout the year the CSN informed on the requests for extension of the authorisation for the handling, processing, transport and storage of nuclear materials submitted by all the nuclear facilities, in application of Royal Decree 158/1995 on the Security of Nuclear Materials.
- Also informed were the security plans for all the first category nuclear and radioactive facilities, in accordance with the new demand of the Regulation on Nuclear and Radioactive Facilities, which includes this Plan among the official operating documents of these installations.
- During 2009 the security systems of the Cofrentes, Santa Mariá de Garoña, Almaraz, Vandellós II, Ascó and Trillo nuclear power plants and the Juzbado fuel assembly manufacturing facility were inspected, in collaboration with specialists from the Ministry of the Interior, in relation to compliance with the requirements established in CSN Instruction IS-9.
- Furthermore, in 2009 the CSN initiated the work required to integrate security as a strategic area in the Integrated Plant Supervision System (SISC), this to be added to the areas of nuclear safety and radiological protection currently in use.
- In the area of international cooperation, the CSN participated in activities on security promoted by the IAEA, such as the revision of various standards and the development of two international courses. Furthermore, as a member of the European Nuclear Security Regulators Association (ENSRA), the CSN attended the seventeenth meeting held in Holland and a meeting on the security of radioactive sources, organised in Paris.

4. External relations

4.1. Public information and communication

Throughout 2009 a total 138 informative bulletins were published, aimed at the media and at stakeholder institutions in the areas of competence of the organisation. Particularly noteworthy, in addition to the incidents registered at the nuclear and radioactive facilities, were the main agreements of the Board of Commissioners, the CSN's most significant activities on the institutional and international scenes, the conferences held at the headquarters of the regulatory body and the mandatory emergency simulation exercises performed every year. Likewise, 58 summaries of reportable events were published on the website, in keeping with the notification criteria in force.

Furthermore, the media made 1,075 direct requests for information, to which the pertinent replies were provided. One of the most relevant subjects covered was the decision of the Board of the CSN to renew the operating permit for the Santa María de Garoña nuclear power plant. In view of the fact that this plant was to be the first in Spain to exceed its 40-year design lifetime, the CSN, in keeping with its policy of transparency and public information, established a communication strategy aimed at providing a better understanding of the work that a renewal of this type entailed and of what this meant for the regulatory body. The available dissemination tools, such as the external website and the corporate magazine *Alfa*, have been used to achieve this objective.

Throughout the year 5,101 news items have been published mentioning the CSN. Of these, 77.6% were published in the press, compared

to 15.1% on the radio and 7.3% on television. The total number of positive news items published or broadcast amounted to 2,905, compared to 196 of a negative nature and 1,997 neutral.

The remodelling of the CSN's corporate Internet website was another of the most salient issues last year. This new website, which received 265,077 visits in 2009, has allowed us to inform society of the work performed by the Council, to reduce the barriers to access through an enhanced accessibility, to facilitate browsing and access to information and to improve the mechanisms for interaction with the members of the public by means of new services. The new design of the website allows it to be multilingual; in this respect the CSN published the English version of www.csn.es in December 2009 and is working on the design of the site for it to be adapted to the other official languages of the Spanish State.

As regards specifically information for the public, the most important activities performed in 2009 were the following:

- Publications: publishing of 34 different editions (42,082 copies) and the re-editing of a further 22 (50,500 copies), with a total distribution of 69,057 technical and informative publications. In addition to the periodic publications and legal, technical or informative documents, mention may be made of the quarterly publication of the CSN's magazine *Alfa* on matters relating to nuclear safety and radiological protection.
- Information Centre: the centre received 7,354 visitors, the majority from educational centres and institutions; several of the facility's informative modules were renovated and the centre collaborated with the Community of Madrid in the annual

open day, welcoming all those interested in learning of the CSN's activities.

- Congresses and exhibitions: presence of the CSN with a stand offering publications at the *Congress of the Spanish Societies of Medical Physics and Radiological Protection*, the *9th Science Week of Castilla-La Mancha* and the *Session on Nuclear Energy*.
- Series of conferences: organisation in 2009 of the following conferences, with an average participation of between 100 and 150 persons per conference: the *7th Euratom Framework programme* (Octavi Quintana), *Professional and social development of change management: the Microsoft case* (Elena Dinesen), *The Foundations of Nuclear Regulation in the 21st Century: Safety, Security and Global Communication* (Dale E. Klein) and *Nuclear Safety in Europe* (Andris Piebalgs).

4.2. Institutional relations

As the regulatory authority in charge of nuclear safety and radiological protection in Spain, the Nuclear Safety Council nurtures a wide range of institutional relations that allow it to be more efficient in the performance of its regulatory function. Particularly outstanding within this institutional framework are the relations with the Congress and the Senate, along with the relations of collaboration with and consulting for the State institutions at central, autonomous community and local level, with professional and trade union organisations and with associations and non-governmental organisations involved in areas relating to its activities.

The CSN submits an annual report to the national Parliament and to the Parliaments of those autonomous communities that have nuclear facilities in their territories, detailing

the activities carried out during the year. Every year this report is presented to Parliament during the appearance made by the President of the Council before the Commission for Industry, Tourism and Trade. Also, and as part of its relations with Parliament, the CSN responds to the requirements of the different political parties, made through parliamentary questions and resolutions issued with respect to the annual report. During 2009 the CSN replied to 31 resolutions relating to the annual report for 2007 and to 10 parliamentary questions.

In the context of the relations that the CSN maintains with the General State Administration, in 2009 the Council has continued its habitual collaboration with the Ministry of Industry, Tourism and Trade, submitting to it the report on the request for renewal of the operating permit for Santa María de Garoña nuclear power plant, among others, and participating in the annual meeting held between this Ministry and representatives of the autonomous communities with function assignments.

Particularly significant as regards the Ministry of Education has been the signing of the collaboration agreement for the updating of the Radiological Protection Manual for secondary schools, drawn up by the European Commission. With the Ministry of the Interior, and within the framework of the specific agreement signed in 2007, agreement was reached regarding the *State assessment of the design basis threat* and the preparation of communication protocols.

The CSN has also continued its collaboration with the National College of Civil Defence and Emergencies for the development of training programmes. Work has continued on the Epidemiological Survey with the Ministry of

Science and Innovation, through the Carlos III Institute of Health. Likewise, institutional contacts have been maintained with both the Ministry of the Environment and Rural and Marine Habitats and the Ministry of Public Health and Social Policy with a view to progressing in relation to future collaboration framework agreements.

During 2009 the CSN has continued its contacts with the autonomous administrations of Asturias, the Balearic Islands, Catalonia, Galicia, the Canary Islands, Murcia, Navarre, the Basque Country and Valencia through functions assignment agreements and has maintained high level contacts with the autonomous community of Extremadura with a view to progressing in relation to a future collaboration.

In the area of local administration, the CSN regularly collaborates with those town councils in whose municipal territory there are nuclear power plants, actively participating on the information Committees held annually in the vicinity of such facilities. Likewise, the CSN maintains fluid institutional communications with the Association of Municipalities in the Vicinity of Nuclear Power Plants (AMAC), with which an exceptional meeting was held during the year to report on the process of renewal of the operating permit for the Santa María de Garoña plant.

Within the framework of institutional relations, the CSN has agreements with companies and institutions in its realm of competence as the regulatory body. During 2009 an agreement was signed with the Spanish Electricity Industry Association (Unesa), establishing mechanisms for the coordination and planning of research projects relating to nuclear safety and radiological protection. Along these same lines are the agreements with Ciemat, the

continuity of the university Chairs with which the CSN collaborates, belonging to the Polytechnic Universities of Catalonia and Madrid, and the specific agreements with different universities throughout the country on environmental radiological surveillance. Fluid relations have also been maintained with the trade unions in the sector, as well as with the *National Nuclear Power Plant Workers' Committees Coordinating Panel*, and replies have been given to the requests for information from non-governmental organisations involved in environmental protection and sustainable development.

Finally, and within the institutional framework of the Council, the programme of aids for training, informative and dissemination activities relating to the areas of competence of the CSN has continued, with a budget of 75,000 Euros, along with the programme of institutional visits that began in 2008 with the aim of promoting institutional collaboration and reinforcing the transparency of the organisation, which during 2009 has included visits by 10 institutions, among them journalists' associations, associations relating to radiological protection, the Council of Chambers of Commerce and Council for Economic and Social Affairs and the Panel of the Congressional Commission for Industry in charge of relations with the CSN.

4.3. International relations

The main activities carried out in 2009 have been as follows:

European Directive on Nuclear Safety

Participation in the development of Directive 2009/71/Euratom establishing a community framework for the nuclear safety of nuclear facilities, from its gestation within the European Nuclear Regulators Group

(ENSREG) and the Western European Nuclear Regulators Association (WENRA) to its definitive development within the Atomic Anstons Group. The new directive establishes the principle of licensee responsibility for safety and requires the licensees to periodically assess and verify and continuously improve the nuclear safety of their installations, as well as to provide and maintain financial and human resources adequate for compliance with their obligations in relation to the nuclear safety of the plant. It also requires the Member States to guarantee the effective independence of the controlling authorities, which must have the legal powers and the human and financial resources necessary to comply with the obligations established by the directive.

Regulatory assistance activities

In view of the geographical proximity of North Africa and the interest announced by certain North African countries in launching civil nuclear programmes, this region is of special interest for the CSN. In this respect, the Council has participated in an IAEA assistance programme, financed through the extra-budget programme with contributions by Spain (MAEC and CSN), to assist these countries in the control of radioactive sources. Likewise, the CSN participated in the definition and performance of other regulatory assistance programmes within the framework of the EU.

The CSN has continued to collaborate with the countries of Latin America, for reasons of strategic interest and due to the continuous requests for assistance by the Spanish-speaking nations. This assistance is provided both bilaterally, as is the case for México, and multilaterally within the framework of the Ibero American Forum of Radiological and Nuclear Regulators, Foro.

International conference on radiological control and the management of scrap

In February 2009 the *International Conference on Control and Management of Inadverted Radioactive Material in Scrap* was held in Tarragona. During this conference it was unanimously agreed that there was a need to undertake international action in this respect, such as the drawing up of a convention on the issue. Also underlined was the need to establish and define levels for international commerce, following the detection of problems arising from the trading of products incorporating contaminated metals from overseas. Another aspect that arose during the conference was the need to take into account the problems and concerns of the metallurgy industry through the development of strategies with clear accountabilities, financing mechanisms, training and systems for the management of the consequences of accidents and incidents deriving from radioactively contaminated metals.

It was considered in this field that an example to be taken into account was the experience acquired in Spain since 1999 through the application of its protocol on the radiological surveillance of metallic materials.

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

In 2009 the third review meeting of the Parties to the *Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management* took place at the IAEA headquarters in Vienna. This meeting, which constitutes the last phase of the activities relating to this convention, gave Spain the opportunity to present its national report before the contracting parties to this international instrument. The Spanish report describes the national radioactive waste and spent fuel management infrastructure, strategy and policies, placing special emphasis on

the regulatory system that guarantees the safety of such practices. The national presentation dealt with the activities carried out by Spain since its previous edition. As a result of the meeting, good practices and challenges were identified at national and international level, these needing to be taken into account in the future to continue to contribute to the shared objective of on-going improvement in the subject matter of the convention.

Bilateral activities with the United States

The CSN and the United States Nuclear Regulatory Commission (USNRC), continued their intensive collaboration in the exchange of personnel and technical information. In October the CSN hosted the bilateral meeting with the USNRC, in which various technical areas of mutual interest were identified and commitments and lines for collaboration between the two organisations were established.

Bilateral activities with France

The CSN and the French Nuclear Safety Authority (ASN), continued their programme

of joint activities, particularly significant among which are the exchange of personnel and crossed inspections. In November the CSN hosted the bilateral meeting with the ASN, during which the renewal of the framework collaboration agreement was signed, along with a specific agreement relating to nuclear or radiological emergency planning, preparedness and management.

Other international activities

During 2009 the CSN continued its participation in the activities of the International Atomic Energy Agency (IAEA) and the Nuclear Energy Agency (NEA/OECD). It also participated actively with the different associations of nuclear safety and radiological protection regulators, especially the International Nuclear Regulators Association (INRA), the Western European Nuclear Regulators Association (WENRA), the Head of European Radiological Control Authorities (HERCA) and the Ibero American Forum of Radiological and Nuclear Regulators (Foro).

5. Training and R&D

5.1. Training

The CSN attaches special importance to the training of its human resources, through the Training Plan. The Plan for 2009, aligned with the objectives of the CSN's strategic plan for 2005 - 2010, has been broken down into seven areas: nuclear safety, radiological protection, development of management, organisational and communication skills, standards, administration and management, information systems, languages and the preparation of public officers undergoing practical training. This last area, which has been integrated into the training plan for the first time in 2009, aims to facilitate the adaptation of new arrivals to their job post from the very moment they join the CSN.

The total number of hours dedicated to training by the CSN personnel has been 37,510, equivalent to 5% of the working schedule, with a total cost of 701,939,27 euros, i.e., an average cost per person of 1,484 euros.

The CSN's training efforts have amounted to an average 2.5 participations per worker in training activities.

In 2009 a competenced-based management model was implemented for the first time, applied to training. This was designed on the basis of the CSN's requirements with a view to adapting the training to the individual needs of each job post in the organisation, and has been evaluated for the professional development of all the CSN personnel. Likewise, there has been continued promotion of the presence of the CSN personnel at national and international

congresses, meetings and seminars relating to their functions and areas of competence.

5.2. Research and development

The CSN's activities in this area are encompassed by the Research and Development Plan, which establishes the bounding conditions under which the projects to be addressed during each four-year period are to be carried out.

The CSN's Research and Development Plan for the period 2008-2011 is built around eight programmes or areas of action: nuclear fuel and reactor physics, safety assessment modelling and methodologies, performance of materials, new technologies, radioactive waste, control of exposure to radiations, dosimetry and radiobiology and emergency management and the analysis of incidents. The following are among the high level objectives:

- Contribute to ensuring a high level of nuclear safety and radiological protection at the existing facilities, to the end of their service lifetime.
- Improve the surveillance and control of the exposure of the workers and the public to ionising radiations.
- Continue to progress in the development of radiological protection in medical exposures.
- Make available at the appropriate moment in time the technical resources and know-how required to appreciate the risks associated with future installations.

In 2009 the CSN managed a total 68 R&D projects; of these, 15 have been completed during the year, 35 have been started during the year and 18 initiated in previous years have continued beyond 2009. The budget for the

CSN's R&D activities in 2009 amounted to 3.3 million Euros.

The CSN continuously reviews and analyses its R&D activities with a view to increasing the efficiency of the processes for project selection, tracking and management and to increasing the technical feedback of the results in the performance of its functions.

In 2009, the CSN has developed three data-processing tools to improve analysis, selection, the assessment of projects and the general framework of R&D management, which will be implemented in 2010 and integrated in a CSN R&D information and dissemination system via Internet:

- A documentary system, incorporating a new set of criteria for project selection and the evaluation of results.

- A database on project management and information, updated with respect to the current database.
- A system for the calculation of the *Equivalent investment return rate*, to allow for the valuation of intangible criteria.

The most relevant milestone during the year has been the publication and resolution of the call for the granting of subsidies for R&D projects, on the basis of the principles of publicity, concurrence and objectiveness, to the amount of two million Euros and for a period of three years. In this call requests were received from 36 public and private entities, which submitted a total 56 projects amounting to more than nine million Euros. The sum foreseen in the call was finally awarded to 13 projects presented by 10 entities.

6. Regulations and standards

6.1. National and international regulations

The regulatory framework of the CSN has been affected in 2009 by the approval and publication of several provisions, among them the following:

- Law 11/2009, of October 26th, regulating quoted limited companies investing on the real estate market, which modifies the Nuclear Energy Act, Law 25/1964 of April 29th, adding article 38b *Radioactive waste management*.
- Royal Decree 243/2009, of February 27th, regulating the surveillance and control of transfers of radioactive waste and spent nuclear fuel between member States or to or from locations outside the community.
- Royal Decree 1085/2009, of July 3rd, on the installation and use of X-ray apparatus for medical diagnosis purposes, this replacing and annulling the previous Royal Decree 1891/1991, of December 30th.
- Royal Decree 1428/2009, of September 11th, modifying the Basic Nuclear Emergency Plan, approved by Royal Decree 1546/2004, of June 25th.

Likewise, the CSN has participated in the promotion and development of various projects of different rank, among them the following:

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

- Draft Royal Decree approving the new Statute of the CSN.
- Draft Royal Decree for modification of title VII “Natural radiation sources” of the Regulation on the Protection of Health against Ionising Radiations (Royal Decree 783/2001, of July 6th).
- Draft Royal Decree on the Security of Nuclear Materials, which will annul Royal Decree 158/1995, of February 3rd.
- Draft Royal Decree for the modification of Royal Decree 1836/1999, of December 3rd, approving the Regulation on Nuclear and Radioactive Facilities for the development of article 37 of the Nuclear Energy Act, Law 25/1964, of April 29th, on the *obligatory nature of medical analyses to detect alcoholism and drug addiction in personnel rendering services at nuclear facilities*.
- Draft Royal Decree on the *Basic Directive for the Planning of Civil Defence in response to Radiological Risk*.
- Drawing up of the action plan deriving from the legal standards harmonisation work carried out by the WENRA group for improvement of the regulatory process.
- Drawing up of a basic standard of legal rank on the management of low and intermediate level radioactive waste.

Furthermore, the CSN has continued to participate in the following processes relating to the development of standards at international level:

- Collaboration with the IAEA in making available to the Spanish-speaking community the texts in Spanish of the Guidelines of the said international organisation.

- Activities within the WENRA working groups in relation to the harmonisation of European standards in the field of nuclear safety.

Finally, it should be pointed out that in 2009, and in keeping with a suggestion made by the IRRS Mission, an initial version of a Glossary has been drawn up including all the definitions existing in the laws and regulations applicable to the CSN, and in the Council's Instructions and Safety Guides. This is expected to be completed in 2010 and will serve as a reference for the preparation of future regulatory documents.

6.2. CSN technical standards

During 2009 the CSN has continued its efforts in drawing up Council Instructions and Safety Guides.

Most of the Instructions and Guides that are currently being addressed arise from the commitments acquired in relation to the harmonisation of standards within the framework of the Western European Nuclear Regulators Association (WENRA), although efforts are also made to complete the development of standards in fields such as the regulation of radiological protection against ionising radiations of natural origin or the

regulation of dismantling and radioactive waste management.

In 2009 the CSN approved four new Council Instructions:

- Nuclear Safety Council Instruction IS-20 of January 28th 2009, establishing safety requirements relating to spent fuel storage casks (BOE n.º 42, of February 18th 2009).
- Nuclear Safety Council Instruction IS-21 of January 28th 2009 on the requirements applicable to modifications at nuclear power plants (BOE n.º 43, of February 19th 2009).
- Nuclear Safety Council Instruction IS-22, of July 1st 2009, on safety requirements for ageing management and the long-term operation of nuclear power plants (BOE n.º 166, of July 10th 2009).
- Nuclear Safety Council Instruction IS-23, of November 4th 2009, on in-service inspections at nuclear power plants (BOE n.º 283, of November 24th 2009).

In addition, in 2009 the CSN approved a new Safety Guide:

- Safety Guide GS-07.10. *Site emergency plan at radioactive facilities.*

7. Management of resources

7.1. Human resources

As of December 31st 2009, the total workforce of the CSN amounted to 473 persons, 1% more than in 2008, 51% women and 49% men with an average age of 49 years.

Of the personnel working at the CSN, 65.75% are post-graduates, 5.70% are graduates and 28.55% have other qualifications.

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

During the year, the eleven candidates who passed the selective tests corresponding to the call issued in 2008 were appointed as public officers belonging to the Upper Scale of the Nuclear Safety and Radiological Protection Corps. Likewise, the candidate who successfully completed the selective process for the job post corresponding to the aforementioned worker outside the agreement was declared to have passed.

In 2009 three job posts were covered by the system of free designation and 13 by competition, and the model for the recognition of professional experience was applied for the fourth time, affecting 22 members of the CSN staff.

7.2. Economic resources

The accounting of the organisation is performed in accordance with the *General*

public accounting plan, the economic aspects being broken down into budgeting items (income and outgoings) and financial items (financial statement and balance sheet).

a) Budgeting items:

The definitive budget for 2009 amounted to 51.2 million Euros, with no modification with respect to the initial budget, this implying an increase of 13.1% over the previous year.

As regards income, the net recognised charges amounted to 48.0 million Euros, a rate of execution of 93.8% of the definitive budget, with a variation of 5.1% with respect to the previous year. Of these, 90.2% corresponded to public prices and fees.

As regards expenses, the net recognised obligations amounted to 44.5 million Euros, a rate of execution of 87.0% of the definitive budget, with a variation of 8.1% with respect to 2008.

b) Financial items:

The operating account shows a positive result of 2.1 million Euros in the 2009 financial year.

As regards income, the rates for services rendered were the main source of CSN financing, representing 87.8% of the total, the remaining 12.2% corresponding to current transfers and subsidies, financial revenues and other management income.

As regards expenses, 54.5% corresponded to personnel costs, 32.4% to external services, 4.8% to transfers and subsidies, 4.0% to transfers for depreciation and the rest to expenses relating to transfers to provisions, taxes, financial costs and extraordinary losses and expenses.

The balance sheet on closure of the 2009 financial year reflects a equilibrium between assets and liabilities, to a total sum of 44.7 million Euros. The structure of the assets is: 43.1% corresponding to tangible fixed assets, 4.0% to intangible fixed assets, 12.2% to debtors, 40.5% to cash in hand and the rest to temporary financial investments and time period adjustments. As regards liabilities, 95.1% corresponds to own funds, 4.3% to short-term creditors and 0.6% to provisions for risks and expenses.

7.3. Information systems

The most noteworthy initiative in 2009 has been making the *CSN virtual office* available to the members of the public and administrated parties. This allows all the services of the Organisation to be carried out via internet, in accordance with Law 11/2007, of June 22nd, on electronic access to public services for the members of the public.

The virtual office allows for arrangements and proceedings in relation to nuclear and fuel cycle facilities, radioactive facilities, companies

homologated for the delivery of training, external companies, service entities, personnel licences and accreditations, non-regulated installations, the radiological protection of the workers and the environment, subsidies for training, information and dissemination activities, subsidies for R&D projects, complaints and reports on the operation of nuclear and radioactive facilities, the documentation register of official organisations and the general register and resources of the CSN.

Other significant activities have been the development and start-up of a new more flexible and functional web portal, activities for the automation of administrative procedures initiated by the employee through the use of digital certificates and the electronic signature, the operational start-up of a new version of the *N network* for the interconnection of the nuclear power plants, the coordination centres of the Basic Nuclear Emergency Plan and the CSN in the event of an emergency, and the equipping of the emergency plan radiological groups with satellite communications for the radiological monitoring of access controls.

8. Strategies and management system

8.1. Strategic plan and annual work plan

The Strategic Plan currently in force establishes the overall objectives and strategies of the CSN for the period 2005-2010 and is deployed annually through the Annual Work Plan (PAT), which contains the operational objectives and most significant activities to be performed by the CSN organisation in each year.

The PAT for 2009, approved by the Council on January 28th 2010, was prepared in accordance with the the planning model implemented at the CSN, which contemplates its integration in the Strategic Plan, by means of the directives and objectives for 2009. The tracking of the PAT is accomplished by means of a control panel that includes indicators of the evolution of the most significant activities foreseen and their comparison with the objectives mapped out previously.

8.2. Management system

The CSN has implemented a process-oriented management system based on the requirements of the IAEA and ISO standards. The system is documented in the Management System Manual, the Organisation and Operation Manual and the procedures through which they are enacted. All these documents, along with the information and documentation required for the performance of the regulatory activity, are available to all the personnel on the CSN Intranet, with certain exceptions for reasons of security or confidentiality.

The processes have been classified as follows:

- Strategic, including the operation of the Council, information and communication and standards development.
- Operational, including the authorisation, assessment, supervision and control of facilities and activities (including transport); the licensing of personnel; the radiological protection of the workers, public and environment; the management of emergencies and security.
- Support, including institutional and international relations; research and development; economic and human resources management (including training); information systems; documentation and administration of the Management System.

The Management System is subject to on-going improvement through the assessment of compliance with plans and objectives, internal audits and external assessments by national and international organisations.

The recommendations and suggestions made by the IRRS Mission in 2008 have been incorporated in the *CSN Action Plan*, which contemplates the actions required for their implementation and their periodic tracking by the Management System Committee of CSN. The following improvements have already been introduced at the CSN and in the rest of the Spanish regulatory system as a result of the recommendations made by the IRRS Mission:

- Annual performance of a systematic compilation of the results of inspections performed at the radioactive facilities, identifying any deviations, good practices and other noteworthy aspects, obtaining lessons learned in order to improve both the

performance of the licensees of the facilities in relation to safety and radiological protection and the inspection and control activities of the CSN itself (IRRS Mission recommendation No 2).

- The Ministry of Industry, Tourism and Trade has launched a public call to determine which municipalities are interested in hosting the Centralised Temporary Storage (ATC) facility for spent nuclear fuel and high level wastes and associated technology centre (IRRS Mission recommendation No 3).
- Formalisation and implementation of a programme of internal audits of management processes (IRRS Mission recommendation No 4). The programme of

internal audits ensures that all the operating procedures are audited every three years, and the rest at least every four years. In the case of processes with assigned activities, the programme contemplates these audits including the said activities. Seven audits have been performed during 2009, one of which covered activities assigned to the Regional Government of Valencia in relation to the transport of radioactive material.

The CSN has requested an IRRS follow-up Mission from the IAEA, to be carried out during the early months of 2011, in which the IAEA will check on the implementation of the improvements deriving from the recommendations and suggestions made in 2008.

Annex I: Main Nuclear Safety Council Board agreements in 2009

Meeting	Date	Agreement
1,100	28-01-09	Council Instruction, IS-20, on safety requirements relating to spent fuel storage casks.
1,111	16-04-09	Collaboration agreement on R&D between the CSN and Unesa.
1,116	18-05-09	Vandellós II nuclear power plant: authorisation for start-up of the new essential services water system (EJ system), clearance of the current system (EF) and associated revision 59 of the Operating Technical Specifications, revision 17 of the Site Emergency Plan and revision 28 of the Safety Analysis.
1,120	03-06-09	Santa Mª Garoña nuclear power plant: favourable report on renewal of the operating permit, revision 4 of the Safety Analysis, revision 4 of the Waste Management Plan and ITS facility.
1,124	24-06-09	Santa Mª Garoña nuclear power plant: complementary report to the Ministry of Industry, Tourism and Trade on renewal of the operating permit (two, four and six years).
1,125	01-07-09	Ascó nuclear power plant: favourable appraisal of the organisational, cultural and technical reinforcement plan (Procura). Revision 1.
1,125	01-07-09	Council Instruction IS-22 on safety requirements for ageing management and the long-term management of nuclear power plants.
1,125	01-07-09	Complementary Technical Instruction on internal flooding at nuclear power plants.
1,126	08-07-09	Elements of safety culture supervision in the SISC. Conceptual document.
1,126	08-07-09	Working plan for the incorporation of a security-related area in the SISC.
1,133	30-09-09	Agreement with the Military Emergency Response Unit (UME) in relation to intervention in emergency planning, preparedness and response.
1,135	14-10-09	José Cabrera nuclear power plant: change of ownership from Unión Fenosa Generación to Gas Natural SDG, S.A.
1,137	27-10-09	Santa Mª Garoña nuclear power plant: Complementary Technical Instructions associated with renewal of the operating permit for four years.
1,137	27-10-09	Authorisation of a design modification relating to the recovery of a fuel sub-assembly from the spent fuel pool and conditions applicable to Cofrentes nuclear power plant.
1,137	27-10-09	Revision No 95 of the Operating Technical Specifications for Ascó II NPP (pressure and temperature curves and setpoints of the COMS system).
1,138	04-11-09	José Cabrera nuclear power plant: authorisation for dismantling and change of ownership and applicable conditions.
1,139	11-11-09	Initiation of administrative Collaboration Framework Agreement with the Autorité de Sûreté Nucléaire, ASN (France).
1,140	18-11-09	Almaraz nuclear power plant: revision No 95 of the Operating Technical Specifications (COMS system).
1,141	25-11-09	Almaraz I nuclear power plant: design modification for 8% thermal power upgrade, revision AC-24 of the Safety Analysis and revision 96 of the associated Operating Technical Specifications.
1,144	23-12-09	Authorisation for change of ownership of the Trillo and Almaraz I and II NPPs due to acquisition of Unión Fenosa by Gas Natural SDG, S.A.

Annex II: list of abbreviations and acronyms

ANAV:	<i>Asociación Nuclear Ascó-Vandellós:</i> Ascó-Vandellós Nuclear Association.	FUA:	<i>Fábrica de Uranio de Andújar:</i> Andújar Uranium Mill.
ASN:	<i>Autorité de Sûreté Nucléaire:</i> French Nuclear Safety Authority.	HERCA:	Head of European Radiological Control Authorities.
ATC:	<i>Almacén Temporal Centralizado:</i> Centralised Temporary Storage.	HI-STORM:	Holtec International Storage and Transfer Operation Reinforced Module.
ATI:	<i>Almacén Temporal Individualizado:</i> Individual Temporary Storage.	IAEA:	International Atomic Energy Agency.
BOE:	<i>Boletín Oficial del Estado:</i> Official State Gazette.	INES:	International Nuclear Events Scale.
BWR:	Boiling Water Reactor.	INPO:	Institute of Nuclear Power Operations.
Ciemat:	<i>Centro de Investigaciones Energéticas, Medioambientales y Tecnológicas:</i> Centre for Energy-Related, Environmental and Technological Research.	INRA:	International Nuclear Regulators Association.
CRI:	<i>Centro de Recuperación de Inertes:</i> Inert Products Recovery Centre.	IRRS:	Integrated Regulatory Review Service.
CSN:	<i>Consejo de Seguridad Nuclear:</i> Nuclear Safety Council.	IS:	<i>Instrucción Técnica del CSN:</i> CSN Technical Instruction.
DGPCE:	<i>Dirección General de Protección Civil y Emergencias:</i> Directorate General for Civil Defence and Emergencies.	ITC:	<i>Instrucción Técnica Complementaria:</i> Complementary Technical Instruction.
Enresa:	<i>Empresa Nacional de Residuos Radiactivos.</i>	LDL:	Lower Detection Limit.
ENSRA:	European Nuclear Security Regulators Association.	NEA:	Nuclear Energy Agency.
ENSREG:	European Nuclear Regulators Group.	NPP:	Nuclear Power Plant.
ERO:	CSN Emergency Response Organisation.	PAMGS:	<i>Plan de Mejora de la Seguridad de Vandellós II:</i> Safety management improvement plan at Vandellós II.
ETF:	<i>Especificaciones Técnicas de Funcionamiento:</i> Operating technical specifications.	PAT:	<i>Plan Anual de Trabajo:</i> Annual Work Plan.
Euratom:	European Atomic Energy Community.	PBI:	<i>Programa Base de Inspección:</i> Basic Inspection Programme.
		Penbu:	<i>Plan de Emergencia de Burgos:</i> Nuclear Emergency Plan of Burgos.
		Penca:	<i>Plan de Emergencia de Cáceres:</i> Nuclear Emergency Plan of Cáceres.
		Pengua:	<i>Plan de Emergencia de Guadalajara:</i> Nuclear Emergency Plan of Guadalajara.

Penta:	<i>Plan de Emergencia de Tarragona:</i> Nuclear Emergency Plan of Tarragona.	Salem:	<i>Sala de Emergencias del CSN:</i> CSN Emergency Room.
Penva:	<i>Plan de Emergencia de Valencia:</i> Nuclear Emergency Plan of Valencia.	SCAR:	<i>Servicio de Coordinación de Actividades Radiactivas de la Generalidad de Cataluña:</i> Service for the Coordination of Radiative Activities.
PIMIC:	<i>Plan Integrado de Mejora de las Instalaciones del Ciemat:</i> Integrate Plan for Improvement of de Ciemat Installations.	SDP:	<i>Servicio de Dosimetría Personal:</i> Personal Dosimetry Service.
Procura:	<i>Plan de Refuerzo Organizativo, Cultural y Técnico:</i> Organisational, Cultural and Technical Reinforcement Plant.	SISC:	<i>Sistema Integrado de Supervisión de Centrales:</i> Integrated Plant Supervision System.
PVRA:	<i>Programa de Vigilancia Radiológica Ambiental:</i> Environmental radiological surveillance programme.	UMA:	<i>Unidad Móvil de Vigilancia Ambiental:</i> Mobile environmental surveillance unit.
PVRAIN:	<i>Programa de Vigilancia Radiológica Ambiental Independiente:</i> Independent Environmental radiological surveillance programme.	UME:	<i>Unidad Militar de Emergencias:</i> Military Emergency Response Unit.
PWR:	Pressurised Water Reactor.	Unesa:	<i>Asociación Española de Industria Eléctrica:</i> Spanish Electricity Industry Association.
R&D:	Research and Development.	USNRC:	United States Nuclear Regulatory Commission.
REA:	<i>Red de Estaciones Automáticas:</i> Automatic stations network.	UTPR:	<i>Unidad Técnica de Protección Radiológica:</i> Radiological protection technical unit.
REM:	<i>Red de Estaciones de Muestreo:</i> Sampling stations network.	WENRA:	Western European Nuclear Regulators.

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Year 2009 Summary