2008 ANNUAL REPORT

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Introduction

As in previous years, the Nuclear Safety Council publishes its report on the activities carried out during the previous year, with a view to providing the public with a detailed account of the activities described in the Annual Report submitted to Parliament.

Since 1980, the CSN has supervised the nuclear and radioactive facilities in Spain, a complex field that includes industrial and research centres and medical facilities used for both the diagnosis and treatment of diseases.

In carrying out this task, the organisation oversees every phase in each facility, from licensing and operation through to decommissioning.

This document provides information concerning all these activities, as well as on those carried out in relation to environmental protection and the dosimetric monitoring of people working with ionising radiations.

In 2008, the CSN made a significant effort to adapt to the new requirements of the amended Law Creating the Spanish Safety Council, passed in 2007. This amendment expands the organisation's duties and emphasises the need for transparency in its work.

Therefore, this report not only considers the Council's supervision of the operation of nuclear and radioactive facilities in Spain, but also the

improvements made in relation to information and communication, through the launching of the new official CSN website.

In 2008, the CSN's commitment to transparency was highlighted in two ways:

Firstly, at the start of the year, the last phase of the IRRS Mission was implemented. This involved a comprehensive review of our regulatory activities by the International Atomic Energy Agency, which reached very positive conclusions about the CSN and proposed several areas for improvement to make the organisation more effective. These results have been made public and are available on the Council website.

Secondly, the way in which the incident at the Ascó nuclear power plant was handled warrants special mention. In addition to important technical resources, it required extensive coordination with other institutions and in disseminating information.

The report contains more detailed information on these activities, as well as on the international and institutional relationships that the Council is required to coordinate in order to achieve its objectives.

CSN

CHAPTER 1

Institutional framework

The Nuclear Safety Council (CSN) is responsible for authorising and controlling nuclear and radioactive facilities and for radiological surveillance throughout Spain. It was created in 1980 under Law 15/1980, and its structure, duties, competence and organisation were widely modified in October 2007 with the amendment of its Law of Creation. Among other issues, this new law has led to improvements in two aspects that have been essential in CSN management from the very start: independence and transparency.

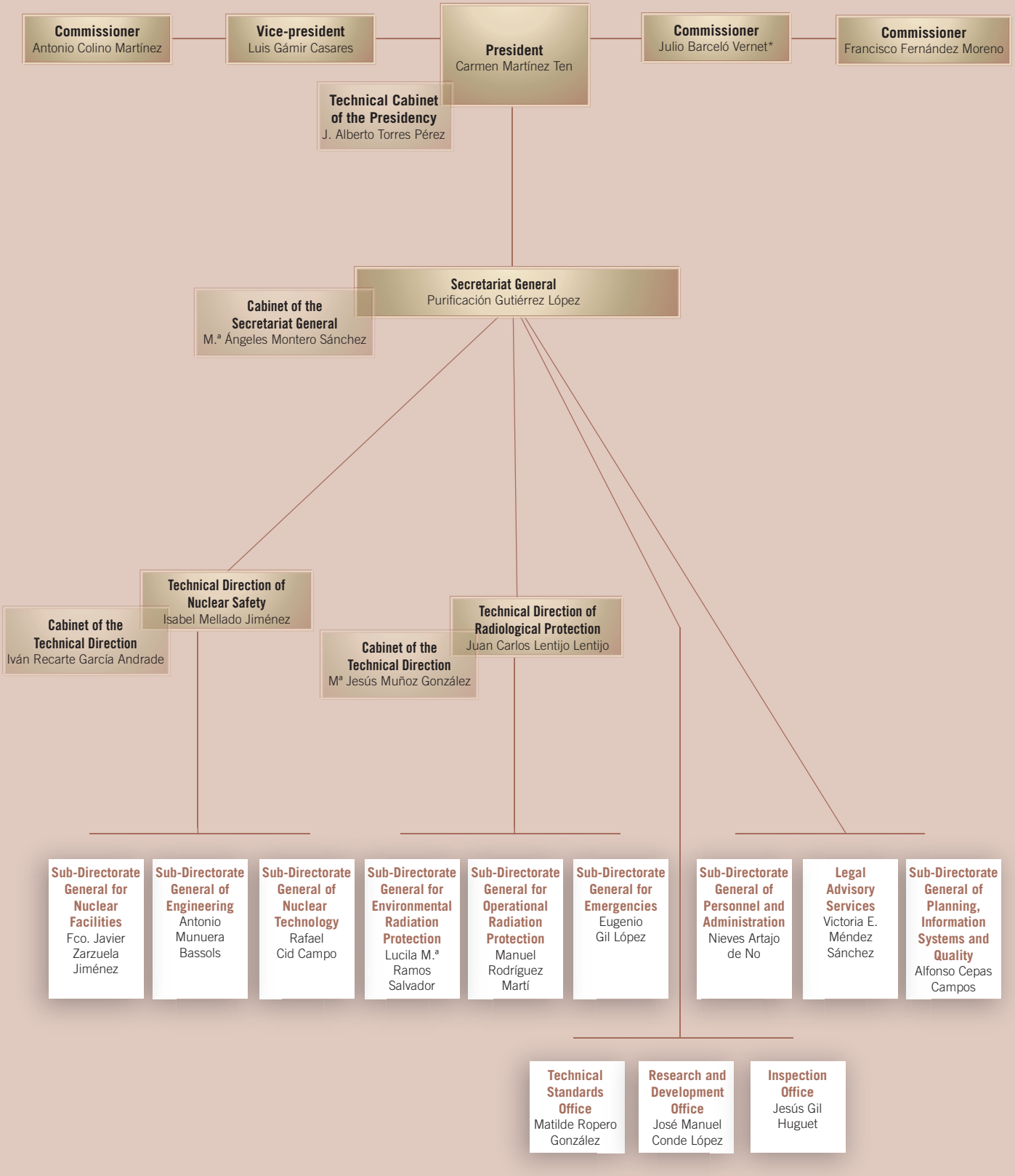
The CSN is an independent institution, separate from both the Central Government and the industry and stakeholder sectors and reports to the Spanish Parliament. Its principal aim is to protect the

population and environment against the risks associated with the use of ionising radiations. Specifically, the CSN is responsible for regulating and supervising nuclear energy facilities, monitoring the radiological quality of the environment, granting licences to individuals working in nuclear and radioactive facilities and licensing and monitoring radioactive medical, industrial or research facilities. Furthermore, the Council provides technical support in the event of nuclear or radioactive emergencies and participates in the drawing up of emergency plans. It monitors radiation levels which workers or the general public may receive, fosters and implements research plans, proposes and approves regulations and maintains open lines of communication with the public and the Parliament. At international level, it is the organisation that represents Spain in the institutions in this field.

Prior to its creation, the activities currently carried out by the CSN were the responsibility of the *Junta de Energía Nuclear* [Nuclear Energy Board], created in 1950 to take advantage of the potential of atomic energy. Under its guidance, the first steps were taken to develop nuclear power plants in Spain and also to control their safety. The need to separate the two activities and ensure objective and independent monitoring led to the setting up of the regulatory organisation in April 1980 through the Law Creating the Spanish Nuclear Safety Council, using the United States Nuclear Regulatory Commission as a model.

Plenary Meeting of the Council in 2008.

Structure and duties



* Replaced in 2009 by Antoni Gurguí Ferrer.

Today, the CSN is an association with a president, vice-president and three counsellors, whose positions are limited to a maximum of two terms of office of six years each. To be elected, they must first undergo an acceptance process before the relevant committee of the Congress. The Council is assisted in its work by a Secretariat General, to which the technical, administrative and legal departments report. In order to ensure that society's demands reach the CSN, the creation of an independent Advisory Committee has been planned. This body will represent the full range of interests and opinions and its mission is to issue recommendations to improve transparency, access to information and public participation regarding the matters for which the Council is responsible. The CSN has a significant team to help it achieve its goals, made up of expert staff members qualified in nuclear technology, radiation protection and environmental supervision.

Summary of CSN operations

1	Issuing of reports for the authorisation of facilities.
2	Inspection and monitoring of the performance of facilities.
3	Proposals regarding corrections and penalties.
4	Proposals regarding regulations and publishing of technical regulations.
5	Granting of operating licences.
6	Collaboration in emergency and physical protection plans.
7	Control of the radiation protection of the workers and the general public.
8	Monitoring and control of the radiological quality of the environment.
9	Collaboration in radiation protection programmes for individuals undergoing medical diagnosis or treatment procedures using ionising radiations.
10	Reporting on criteria for the definition and classification of radioactive waste and on plans for its management.
11	Collaboration in compliance with Spain's commitments in relation to safeguards. Official relationships with similar overseas organisations and participation in the activities of international organisations.
12	Establishment and monitoring of research plans concerning nuclear security and radiation protection.
13	Provide information to public opinion and national, regional and local authorities.
14	Advise the courts and governmental bodies on nuclear security and radiation protection.

Main legal regulations affecting the CSN

Law

- Law 15/1980, of April 22nd, Creating the CSN, modified by Law 33/2007, of 7th November, amending the former.
- Law 14/1999, of May 4th, on Public Rates and Prices for services rendered by the CSN.
- Nuclear Energy Act, Law 25/1964.
- Legislative Royal Decree 1/2008, of January 11th, establishing the Law on the Assessment of the Environmental Impact of Projects.
- Law 27/2006, regulating access rights to information, public participation rights and access to justice in environmental matters.

Regulation

- Royal Decree 1157/1982 approving the Statute of the CSN.
- Royal Decree 1836/1999 approving the Regulation on Nuclear and Radioactive Facilities, amended by Royal Decree 35/2008.
- Royal Decree 783/2001 approving the Regulation on the protection of health against ionising radiations.
- Royal Decree 1891/1991 on the Installation and Use of X-Ray equipment for medical diagnosis.
- Royal Decree 1428/86, of June13th on radioactive lightning rods.
- Royal Decree 158/95 on the physical protection of nuclear materials.
- Royal Decree 1546/2004 approving the Basic Nuclear Emergency Plan.
- Royal Decree 2177/67 approving the Regulation on the Coverage of Nuclear Risks.
- Royal Decree 1132/90 establishing essential radiation protection measures for people undergoing medical examination or treatment.
- Royal Decree 551/2006 regulating the land transport of hazardous goods across Spain.

Regulations of the European Union

- Council Directive 89/618/Euratom on information for the general public on the health protection measures to be applied and steps to be taken in the event of a radiological emergency.
- Council Directive 90/641/Euratom on the operational protection of off-site workers exposed to the risk of ionising radiations during their activities in the controlled zone.
- Council Directive 92/3/Euratom on the supervision and control of shipments of radioactive waste between Member States and into and out of the Community.
- Council Regulation (Euratom) No. 1493/1993 on shipments of radioactive substances between Member States.
- Directive 96/29/Euratom establishing basic safety standards for the protection of the health of workers and the general public against the hazards arising from ionising radiations.
- Directive 97/43/Euratom on the health protection of individuals against the hazards of ionising radiations in relation to medical exposure.
- Council Directive 2006/117/Euratom on the supervision and control of shipments of radioactive waste and spent fuel.
- Directive 2008/68/EC of the European Parliament and of the Council on the land transport of hazardous goods.


CONGRESO DE LOS DIPUTADOS

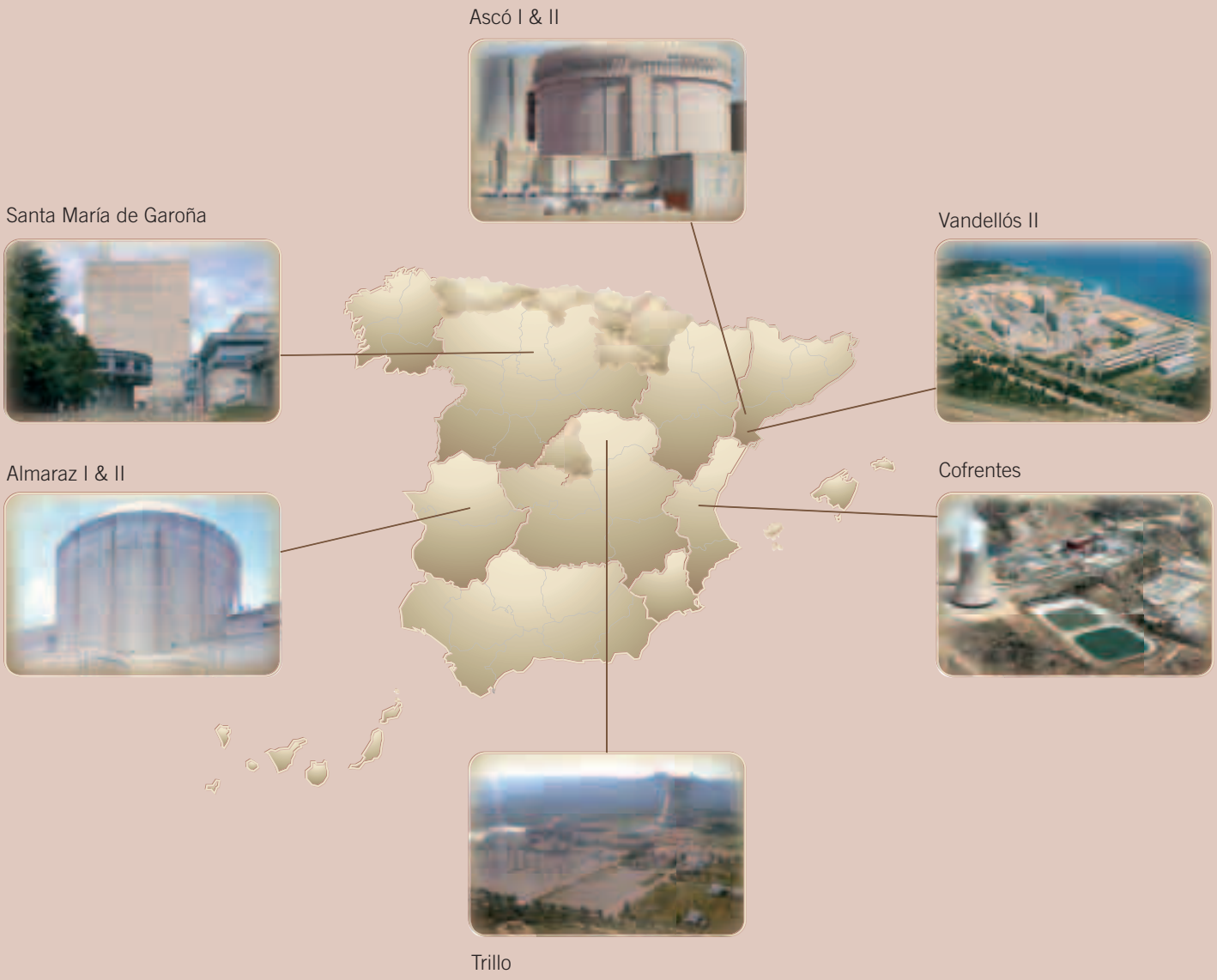
CHAPTER 2

Facility licensing and inspection

Nuclear power plants

The Spanish nuclear fleet is made up of six nuclear power plants with eight reactors. In 2008, all the groups operated within the appropriate safety restrictions, with the exception of an incident in which radioactive particles were emitted from unit I of Ascó power plant. Following the implementation of the immediate response actions and analysis of the available information, the CSN determined that, although this had been a significant event in terms of radiation protection, it did not pose any risk to people or the

Operating nuclear plants



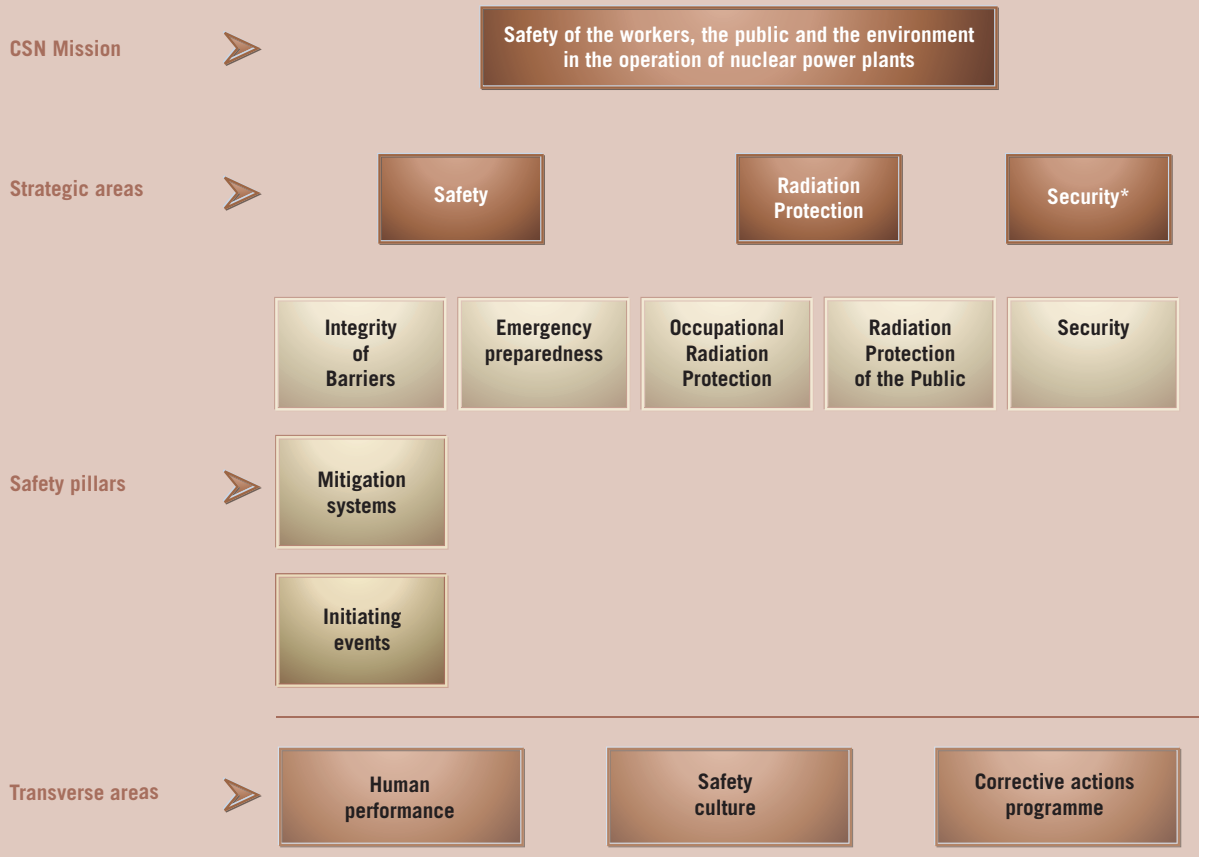
environment. The Council has taken corrective measures and actions, in addition to proposing disciplinary proceedings against the power plant licensee. This incident, together with certain others that have occurred at nuclear power plants in the last two years, has highlighted the need to increase maintenance and safety investment policies at these facilities. Therefore, the Council has requested the electricity utilities to present specific plans for action, priorities and investments.

Power plant operation is comprehensively evaluated using the results from the Integrated Plant Supervision System (SISC), reported incidents (particularly those classified on the International Nuclear Event Scale, INES, as higher than zero), radiological impact, worker dosimetry, relevant modifications, warnings and penalties and operating incidents. As regards notifications, in 2008 the power plant licensees reported a total of 71 incidents, 23 fewer than the previous year. In total, 67 were classed as level 0, three

as level 1 and one as level 2 on the INES scale. The CSN's Incident Review Panel assessed the reported incidents, classifying 18 as *significant*, six as *generic* and four as both *significant and generic*.

Implemented in 2007 and fully consolidated in 2008, the SISC has become the fundamental tool in the assessment of power plant performance, the planning of the CSN's regulatory efforts and the transparency of communication with the public on both issues. It is based on two documentary sources: information supplied by certain automatic operation indicators and risk assessment based on the findings from the inspections carried out. In order to ensure the simple understanding of the results, these are displayed by means of a colour code, which is assigned to each finding or indicator based on its safety significance. The code goes from *green* (very low safety impact) through to *red* (very high), with *white* and *yellow* as intermediate levels. Results are processed every three months and determine the status awarded to each power plant and its regulatory

SISC supervision diagram



* The supervision of security in nuclear installations is still to be approved.

Action matrix status. SISC 2008

Unacceptable operation

Unnacceptable risk: situation implying an unacceptable risk that prevents plant operation for safety reasons.

Acceptable operation

Multiple degradations:
Degrade pillar:
Regulatory response:

→ Situations with anomalies requiring reinforced programmes for the inspection and correction of deficiencies, in increasing degrees.

Licensee response:

→ Basic situation of normality with the application of standard inspection and deficiency correction programmes.

effect, or actions to be taken, ranging from the most positive situation of "licensee response" through to "unacceptable performance", which implies the shutdown of the plant, with a further three intermediate situations.

The SISC results in 2008 have underlined the acceptable performance of all the power plants. With regard to the indicators, the system registered eight *white* codes throughout the year . As regards the findings, there were six *whites* and one *yellow*, which corresponded to the leakage of radioactive particles from the fuel storage building at Ascó power plant. The CSN was notified of this in April 2008. The CSN website offers a link to the SISC www.csn.es/sisc/index.do which provides quarterly

updated information on the performance of all the Spanish nuclear power plants.

Penalties and warnings

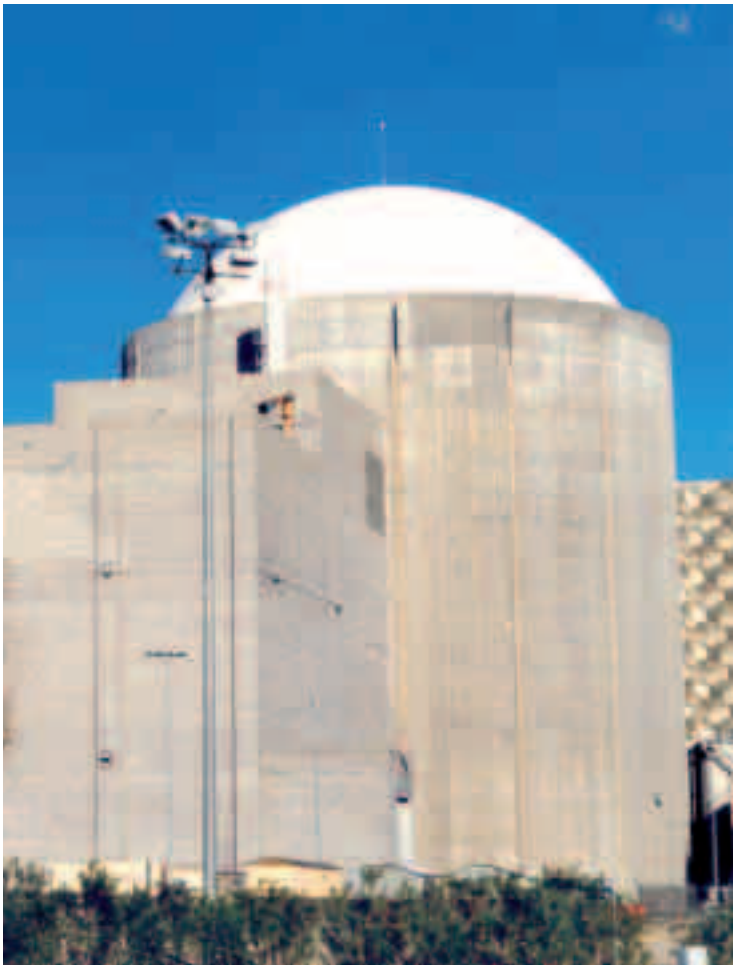
In 2008, the CSN submitted proposals to the Ministry of Industry, Tourism and Trade for two disciplinary proceedings. The first corresponded to Almaraz nuclear power plant for breaching the Operating Regulation, which requires a minimum of 100 classroom hours of on-going training for staff with an operator or supervisor licence. The second concerns Ascó nuclear power plant, for the breaches noted during the radioactive particle emission incident. This proposal recommended a severe high-level penalty, three serious medium-level penalties and another minimum-level penalty. The CSN also agreed to issue a warning to Almaraz nuclear power plant for a minor breach of its Operating Technical Specifications.

Licensing

The Council processed a large number of licensing inquiries from nuclear power plants. It issued 29 decisions regarding various permits and eight positive evaluations. In addition, reports were issued on new revisions of official operating documents for different nuclear power plants, such as site emergency plans, operating regulations, operating technical specifications and safety studies. The Council also agreed on the issuing of a complementary technical instruction to Trillo power plant.

Tracking and control

The CSN undertakes the tracking and control of the nuclear power plants by assessing and monitoring the progress of the various plant safety improvement programmes. In 2008, 178 inspections were carried out. Of these, 104 were related to the SISC Basic Inspection Programme, which involved the performance of practically all the inspections listed in the programme for 2008. The remaining inspections were additional, resulting from inspection indicators or findings with a category higher than green, reactions to operating incidents, generic issues resulting from the new regulations, those arising from plant or third-party



Almaraz nuclear power plant.

operating experience and licensing issues. Particularly significant in this respect has been the important efforts made to investigate and determine the consequences of Ascó power plant active particle emission event, with 11 inspections.

Furthermore, the CSN supports transversal programmes for the improvement of nuclear power plant safety, the following being particularly significant during 2008:

- **Periodic safety review programmes.** The CSN has continued working on the evaluation of the periodic safety reviews submitted by Santa María de Garoña and Almaraz power plants, as well as on the evaluation of the documentation provided by both plants in compliance with the CSN's complementary technical instruction on conditioned application standards, all the above in relation to the renewal of their operating licences, which expire in July 2009 and June 2010, respectively.

- **Revision of generic issues.** A generic issue is deemed to be any safety problem identified in any national or foreign nuclear power plant which might affect other power plants. The CSN requires and encourages all Spanish nuclear power plants to analyse these issues and to adopt the relevant corrective actions. Particularly important throughout 2008 has been the consideration of an incident detected by the NRC, relating to the accumulation of gases in the piping of the emergency core cooling, residual heat removal and containment spray systems, which led the CSN to issue a technical instruction to all the Spanish power plants requesting that they carry out an analysis of this issue. Also, the particle emission incident at Ascó I led the CSN to request that all the Spanish nuclear power plants look at how such an incident might apply to their own plant and complete a special radiological surveillance programme for outside areas on site. In addition, the CSN requested that radiation detection gates be introduced to control any material which might leave the site, along with the revision of the site emergency plans.

Ascó nuclear power plant.

- **Action plan for the improvement of Vandellós II safety management.** In 2007, all the actions anticipated in the four management programmes of the *Action plan for the improvement of safety management* (management and leadership, organisation, management systems and communication) were fully implemented. Thus, in

Vandellós II nuclear power plant.

2008 Vandellós II focused on verifying the effectiveness of the aforementioned actions in 2008, a guide being published for this purpose. In order to supervise this process, the CSN carried out two inspections and held two technical meetings with the licensee. In terms of design modification, only the new engineered safeguards water cooling system has yet to be implemented. Throughout 2008, the licensee has progressed with the construction and assembly of this system, which is planned to be operational in 2009. In tracking these activities the CSN carried out 15 inspections.

- **Ascó organisational, cultural and technical reinforcement plan**. As a result of the particle emission incident at Ascó, the CSN issued the plant licensee a technical instruction requesting an analysis of the root cause of the incident and the definition of relevant corrective actions. The power plant submitted an action proposal, approved by the CSN, aimed at identifying the factors which caused the incident and establishing a basis for the development of an improvement plan known as the Organisational, Cultural and Technical Reinforcement Plan (Procura), with a timeframe of three years. Furthermore, the Council has established a monitoring programme aimed at checking the implementation of the corrective measures included in the plan and their effectiveness.

- **Plans to strengthen power plant resources for 2009-2013**. In view of certain incidents that have occurred at the nuclear power plants over the last two years, and with the aim of identifying possible improvements and strengthening the resources allocated to the areas where needed, the CSN-Unesa Liaison Committee agreed that an analysis should be carried out at each power plant by the respective licensee. This analysis covers maintenance activities, staff training, the analysis of operating experience and the renewal of equipment, as well as staff resources. The results were presented to the CSN in December 2008, to be dealt with during meetings with the licensees throughout the first quarter of 2009. These meetings will continue on a yearly basis, with the aim of updating plans and continually verifying the fulfilment of commitments regarding safety investments and resources.

Fuel cycle and waste disposal facilities and research centres

These types of facilities include the Juzbado fuel assembly manufacturing facility, the El Cabril waste disposal centre and the Energy-related, Environmental and Technological Research Centre (Ciemat). In 2008, all of the aforementioned facilities operated in accordance with the established safety guidelines, and no risk situations arose.

There were two reportable incidents at the Juzbado facility: one relating to the emission of aerosols in the PWR sintering area, during a maintenance operation, without the workers present being affected, and the other relating to a fire in the site security area, beyond the double fence of the facility, which did not affect the plant itself.

At the request of these facilities, the CSN issued nine decisions throughout the year for various permissions, many referring to the approval of new updates of official operating documents. Modifications were approved for various radioactive facilities at Ciemat, this organisation having continued the dismantling and rehabilitation of different areas and buildings within the framework of the Integrated Plan for the Improvement of Installations (PIMIC).

Ciemat facilities complex in Madrid.

Particularly significant in view of its special interest was a design modification to the El Cabril facility for the disposal of very low level waste. The new platform, located on the east side of the facility, has four cells and enables space to be saved on the north and south platforms, designed to house waste with a much higher specific activity.

As part of their respective monitoring programmes, the CSN carried out a total of 40 inspections: 17 at the Juzbado fuel assembly manufacturing facility, 11 at the disposal facility at El Cabril and 12 at Ciemat.

Facilities in shutdown, dismantling or decommissioning phases

Vandellós I and José Cabrera nuclear power plants, Elefante and Quercus uranium plants, Andujar uranium mill and Lobo-G plant at La Haba are in the dismantling and decommissioning phases. The maintenance, characterisation, dismantling and surveillance activities carried out at each facility in 2008, which have varied depending on their respective conditions, took place within the safety guidelines established and posed no undue radiological impact on people or the environment.

The Council has passed 13 decisions for various permits, mainly referring to the approval of official operating documents. Of the activities authorised, the most notable is the start-up of the Individual Temporary Storage (ITS) facility for the irradiated fuel from José Cabrera plant. Furthermore, Quercus plant has obtained authorisation for a two-year suspension of the facility dismantling licensing process, which will enable Enusa to consider resuming production activities. Either way, the conditions of this authorisation ensure that the facility will remain in a safe situation until its final outcome is decided.

As part of their respective control programmes, the CSN carried out a total 32 inspections: three at Vandellós I plant, 14 at José Cabrera plant, eight at Quercus plant, two at Elefante plant, three at Andujar uranium mill and two at Lobo-G plant.

In 2008, there were two reportable events: At José Cabrera plant, faults were detected in the structural material of the reactor building crane. This compromised safety when moving heavy loads above the fuel storage pool. The incident, which was classed as level 0 on the INES scale, was resolved by replacing the affected components. At Quercus plant, there was a false alarm in the fire extinguishing system, which was resolved and had no consequences.

With regard to the most notable activities at José Cabrera plant, these mainly involved the maintenance of the cooling system for the fuel stored in the fuel pool and the fine-tuning of the equipment needed for its safe transfer to the ITS facility. Also significant has been the request by Enresa for authorisation of the plant dismantling and decommissioning plan, which involves transferring ownership of the facility.

Radioactive facilities

The use of radioactive isotopes and radiation generators for scientific, medical, agricultural, commercial and industrial purposes meant that in Spain, as of 31st December 2008, there were 31,093 radioactive facilities, all subject to a prior authorisation, inspection and control system. Of these, 29,714 were declared by their licensees and registered in Spain as X-ray facilities for medical diagnosis. These, too, are subject to monitoring and inspection by the Council. The CSN is responsible for licensing these facilities in collaboration with the autonomous communities with which function assignment agreements have been signed.

CSN inspector at a radioactive facility.

Throughout 2008, the facilities operated in line with the safety guidelines and in accordance with specific measures to protect people and the environment against radiations. Nonetheless, 12 significant incidents were recorded, eight caused by operational faults, one by equipment failure and three by the removal of radioactive equipment. Particularly significant among these events was the overexposure of a worker at the Cualicontrol-ACI, S.A.U. plant in Tarragona, who entered the gammagraphy bunker. The CSN proposed two disciplinary proceedings and issued 69 warnings, identifying the deviations encountered and requiring their due correction.

In 2008, 359 decisions were passed on different radioactive facilities: 56 for operating permits, 35 for decommissioning declarations and 268 for the authorisation of different modifications. Thanks to the measures adopted in 2007 to speed up the licensing process, in 2008 there was a balanced number of requests and resolutions with regard to permits, the overall time for resolution being reduced on average to less than five months. However, the CSN's responsibilities are becoming increasingly complex, which has become apparent through the need to license radioactive facilities that are increasingly innovative, sophisticated and advanced, such as the Sincrotrón Alba facility, built in Barcelona and which will allow for a greater understanding of the field.

The programme for the control and inspection of radioactive facilities is also carried out in collaboration with the autonomous communities with which

Transport of radioactive material.

function assignment agreements have been signed. Throughout 2008, this programme involved 1,593 inspections, the review of periodic reports on the performance of the facilities, the analysis of 238 quarterly marketing reports and the review of 10 complaints. The inspection results, together with the analysis of the annual facility reports, information concerning radioactive material and equipment supplied by the commercialising companies and information provided by Enresa concerning waste management, led to 224 control letters being issued.

In 2008, work continued on the creation of the national inventory of high activity sealed radioactive sources and collaboration continued with the Ministry of Industry, Tourism and Trade with regard to the campaign to recover orphan sources. The CSN continues to promote knowledge of best practices, operational experience and learning from incidents, through informative sectorial circulars. Three circulars have been issued which refer to industrial gammagraphy facilities.

Transport of nuclear and radioactive materials

The CSN monitors, licenses and supervises the transport of nuclear and radioactive substances in Spain. The control of transport is accomplished by inspecting a significant sample of the most important shipments, a task which involves the collaboration of the autonomous communities with assignment agreements. Throughout 2008, 60 inspections took place on the transportation of nuclear and radioactive materials. This control is completed by analysing prior notifications and operation reports required by the CSN for the transportation of fissile materials, high activity radioactive sources and waste. During 2008, 71 shipments of fissile material and 220 shipments of radioactive waste carried out by Enresa were analysed.

In addition, the CSN drew up reports concerning the validation of approval certificates for four foreign packages. Furthermore, two physical protection permits were granted for the transportation of nuclear materials, and two resolutions setting the coverage of risk for the transport of radioactive substances. In total, there were eight incidents relating to the transport of radioactive materials, all of which posed no, or a very limited, radiation risk.

Other licensing and control activities

The CSN is responsible for providing authorisation for the manufacturing of radioactive equipment and granting approval for the type of equipment that uses radioactive substances and radiation generators. During 2008, the CSN passed two decisions for the manufacturing authorisation of radioactive equipment. Furthermore, it reported on 21 authorisations for radioactive appliances, implying the exemption of 43 models from consideration as radioactive facilities.

Chapter VII of the Regulation on Nuclear and Radioactive Facilities deals with the use of radioactive substances in the production, import, export, commercialisation and transfer of consumer goods, radioactive materials and radiation generating equipment, as well as the associated technical support for such equipment and goods. In these areas, the CSN reported on six new authorisations and the modification of 11 previously issued permits. As of 31st December 2008, a total of 33 companies were authorised for these types of activities.

The Regional Government of Castilla y Leon required the CSN to issue a report relating to the 34 requests for prospection, research and use of radioactive minerals submitted in 2008 in the province of Salamanca. Given the large number of such requests and their novelty, the regulatory authority is drawing up a set of generic radiation protection requirements, which will be available in the first quarter of 2009. Likewise, the CSN reported on 15 proceedings authorising the transfer of various unauthorised radioactive materials and sources to Enresa, these resulting from activities at unregulated facilities.

Orphan sources from metallic materials for recycling.

Furthermore, as a result of the application of the Spanish Protocol on the radiological surveillance of metallic materials, the Council received 125 notifications, following the detection of sources at facility gates. These were transferred to Enresa to be managed as radioactive waste. As of the end of 2008, 138 metallurgical facilities subscribed to the protocol.

CHAPTER 3

Radiation protection

Radiation protection of workers

One of the CSN's main tasks is monitoring the protection of workers who are exposed to ionising radiations during their daily work activities. This involves ensuring that facilities are applying all the relevant legislative measures, including evaluation of the radiation risk associated with each activity, classifying worker and workplace radiation, monitoring worker radiation, supplying suitable information and training and monitoring health. The aim of this is to ensure that exposure to radiation is kept as low as reasonably achievable and in all cases below the regulatory levels.

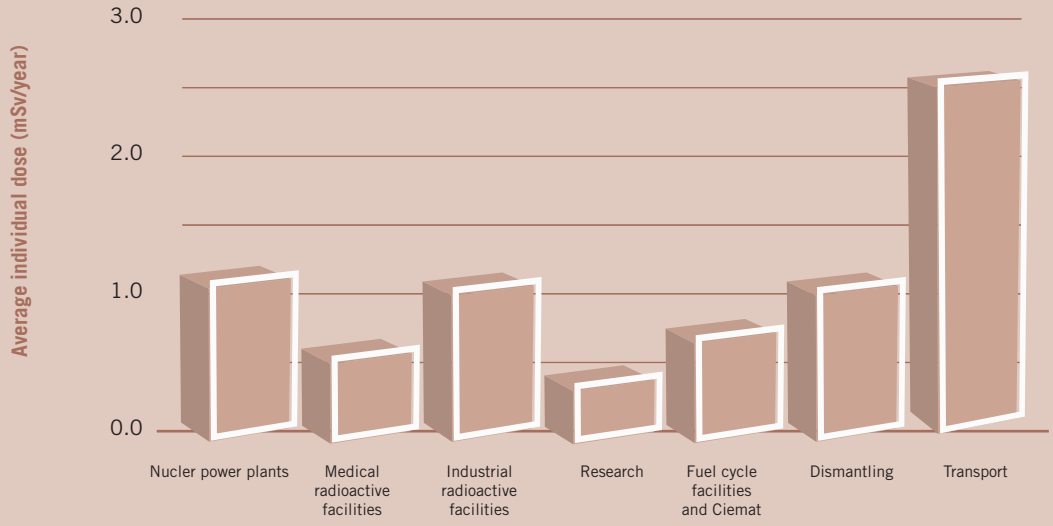
A vital tool to monitor the effectiveness of the aforementioned measures is the National Dosimetry Bank, created by the CSN in 1985. Here, dosimetric records are kept for all professionally exposed workers. The annual maximum doses in Spain are the same as those used in the European Union; 100 mSv accumulated over five consecutive years, with a maximum of 50 mSv each year for workers and 1 mSv per year for the general public.

At the end of the year, the register contained 14,665,000 dosimetric measurements, corresponding to 274,000 workers and 48,000 facilities. Each of these measurements is associated with information concerning the type of facility and the nature of the task carried out. In Spain in 2008, the number of dosimetrically controlled workers exposed to ionising radiations stood at 99,747. The collective dose for all the workers was 21,508 mSv·person and the average individual dose was 0.71 mSv/year.

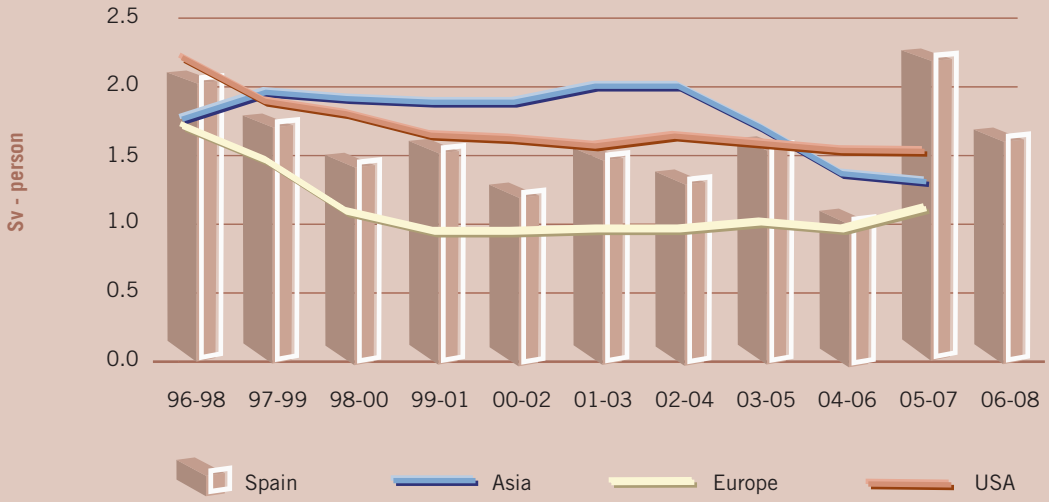
99.99% of the controlled workers received doses of less than 6 mSv/year and 99.99% of these doses of less than 20 mSv/year. The main contributor to the collective dose in Spain is the medical radiation facilities, with a dose of 14,754 mSv·person, representing 69% of the overall collective dose. This is because the 79,486 professionally exposed workers in the sector represent 80% of all the exposed workers.

In accordance with current legislation, workers exposed to radiation must have a radiation identity card. Throughout 2008, the CSN distributed a total of 4,995 cards, for workers at 238 companies.

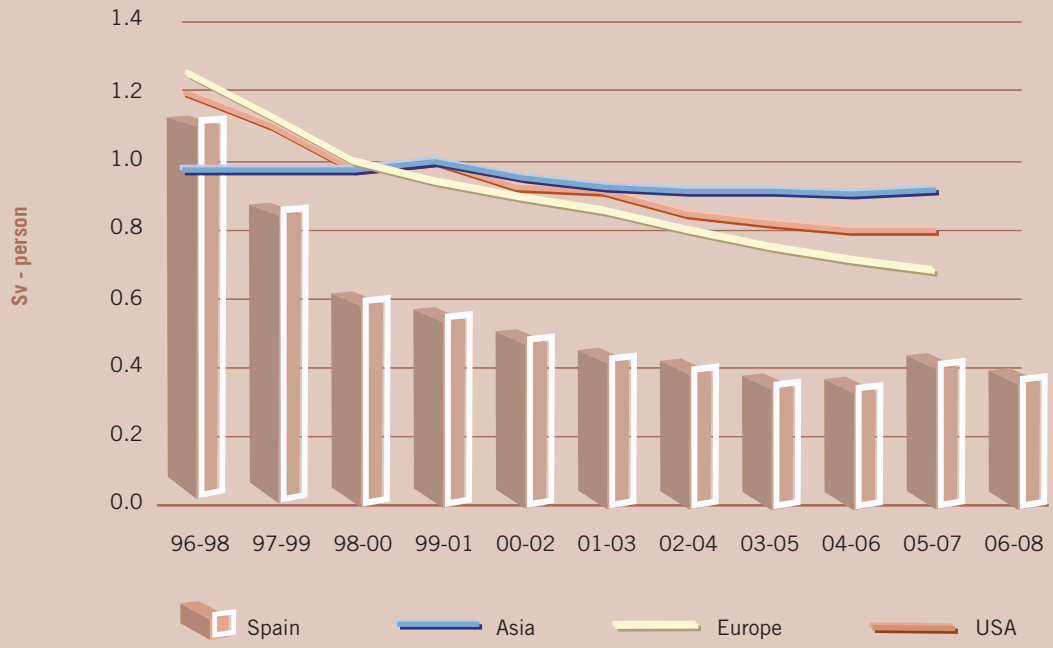
Average individual dose by sectors. 2008



Average triennial collective dose for BWR reactors.
International comparison



Average triennial collective dose for PWR reactors.
International comparison



* In drawing up these graphs, consideration has been given to triennial collective doses for BWR and PWR reactors in each region included in the comparison.

Doses received by workers in each sector

Facilities	Number of workers	Collective dose (mSv·person)	Average individual dose (mSv/year)
Nuclear power plants	6,667	2,749	1.12
Fuel cycle and waste disposal facilities and research centres (Ciemat)	1,201	119	0.70
Radioactive facilities			
· medical	79,486	14,754	0.63
· industrial	7,593	2,996	1.07
· research	4,875	548	0.39
Facilities in the dismantling and decommissioning phase	304	135	1.05
Transport	114	208	2.57

Control of radioactive waste

Management of irradiated fuel and high level waste

The CSN maintains an exhaustive control over the inventory of spent fuel, the safety conditions of the fuel storage pools at the nuclear power plants and the single ITS (individual temporary storage) facility using dry casks that was in operation as of 31st December 2008, at Trillo nuclear power plant. The number of fuel assemblies being stored on the aforementioned date in the nuclear power plant storage pools and in the storage casks at Trillo site was 11,401.

Irradiated fuel dry storage cask.

In addition to Trillo ITS facility, another has been built to store the irradiated fuel elements from José Cabrera nuclear power plant, which is in the process of being dismantled. Following authorisation of the plant design modification, the CSN inspected the preoperational tests, along with the completion of the storage module manufacturing process. Furthermore, two specific inspections were carried out on the ITS facility at Trillo.

Management of low and intermediate level waste

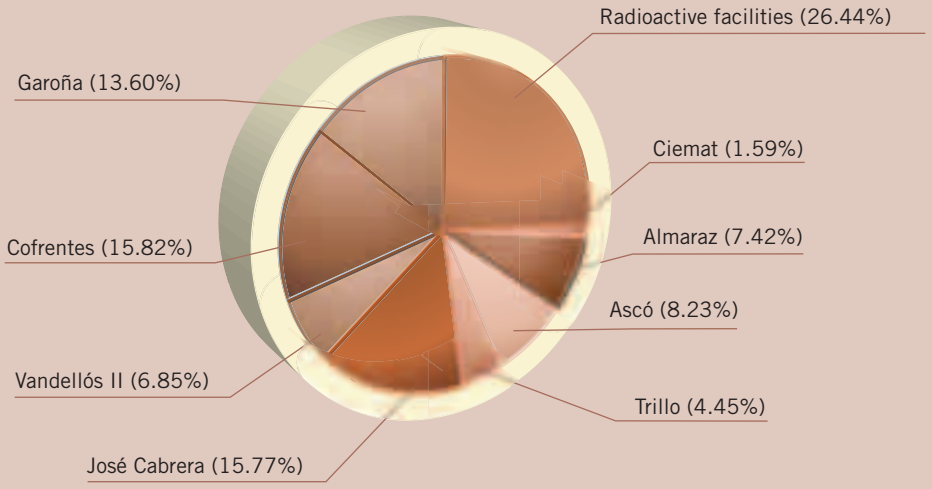
Spain has a disposal centre for low and intermediate level radioactive waste, which is located at El Cabril (Cordoba) and managed by Enresa. The licensing and control process involves supervision of the aforementioned facility, the monitoring and control of the processing, preparation and temporary storage systems for the waste from the nuclear power plants and other fuel cycle and radioactive facilities, as well as for the inventories of solid radioactive waste stored at all the facilities. In 2008, El Cabril facility received 6,127 waste packages or containment units, in addition to 16 samples of low or intermediate level radioactive waste.

Within the facilities, the CSN was responsible for the radioactive waste processing and storage systems as well as the package type acceptance processes. Six specific inspections were carried out at the nuclear sites in 2008.

With regard to very low level waste, the CSN has continued monitoring the start of operations at the new East Platform at El Cabril, as well as the management of the tailings from uranium concentrate plants and the restoration of uranium mines. Notably, the CSN issued its favourable assessment of the surveillance and maintenance programme at the Valdemascaño mine. In order to monitor these activities, the CSN carried out seven inspections. The CSN also assessed Enresa's management of atypical radioactive wastes, these including unauthorised radioactive materials and contaminated metals, as well as radioactive lightning rods, 67 of which were removed in 2008.

Radioactive waste drum.

Distribution of the 6,127 conditioned radioactive waste packages transported to El Cabril in 2008



Protection of the public and the environment

In order to protect the public and the environment, the CSN inspects the outside areas of nuclear, fuel cycle and radioactive facilities, as well as the areas of influence of these installations. This involves assessment of the radiological impact of these facilities and the surveillance and maintenance of the radiological quality of the environment throughout Spain.

The facilities are required to follow strict release limits and maintain systems for the limitation, surveillance and control of radioactive effluents. Records for 2008 remained within the customary levels and are comparable with other European and American facilities. As in previous years, the calculated doses attributable to the aforementioned releases were far below the dose limits in place for the public, and represent a small fraction of the corresponding limits.

In the specific case of nuclear power plants, this fraction does not exceed 7.5% of the dose restriction, set at 100 micro-Sievert.

The licensees of the nuclear and fuel cycle facilities are also responsible for applying Environmental Radiological Surveillance Programmes (PVRA) suitable for the characteristics of each facility and its surrounding areas. These programmes involve radiological analysis in the laboratory of environmental samples (dust, rain, earth, direct radiation, drinking water, groundwater, sediments), indicator organisms and food items (crops, meat, birds, eggs, milk and fish).

The CSN verifies compliance through evaluation of the results, the performance of periodic inspections and independent inspection programmes (PVRAIN), either directly or through function assignment agreements with the autonomous communities, which represent around 5% of the PVRA determinations of the facilities.

PVRA. Number of samples taken by nuclear power plants in 2007

Type of samples	José Cabrera	Garoña	Almaraz	Ascó	Cofrentes	Vandellós II	Trillo
Atmosphere	753	778	777	839	757	796	762
Water	108	188	210	118	142	130	146
Foodstuffs	131	149	311	95	84	91	139
Total	992	1,115	1,298	1,052	983	1,017	1,047

As the waiting time for results from the processing and analysis of the samples taken during these programmes may be more than six months, this report uses figures from 2007, when 6,512 samples were taken from nuclear power plants, 2,000 from fuel cycle facilities and 2,042 from facilities in shutdown, dismantling or decommissioning phases. The 2007 results are similar to those obtained in previous years and the quality levels of the environment surrounding the facilities are correct from the radiological point of view. There were no major deviations between the PVRAINs performed by the CSN and the PVRAs.

In order to ensure the uniformity and reliability of the results obtained in the different PVRAs, and given that around 30 different laboratories took part, the CSN performs periodic intercomparisons and promotes the standardisation of processes applied in the different stages of environmental radiological surveillance. During the period 2007-2009, a project was carried out which assessed environmental radiation levels using thermoluminescent dosimeters, in which seven Spanish laboratories and one overseas laboratory participated. Once completed, it was concluded that all the dosimeters of all the participating laboratories met the acceptance criteria.

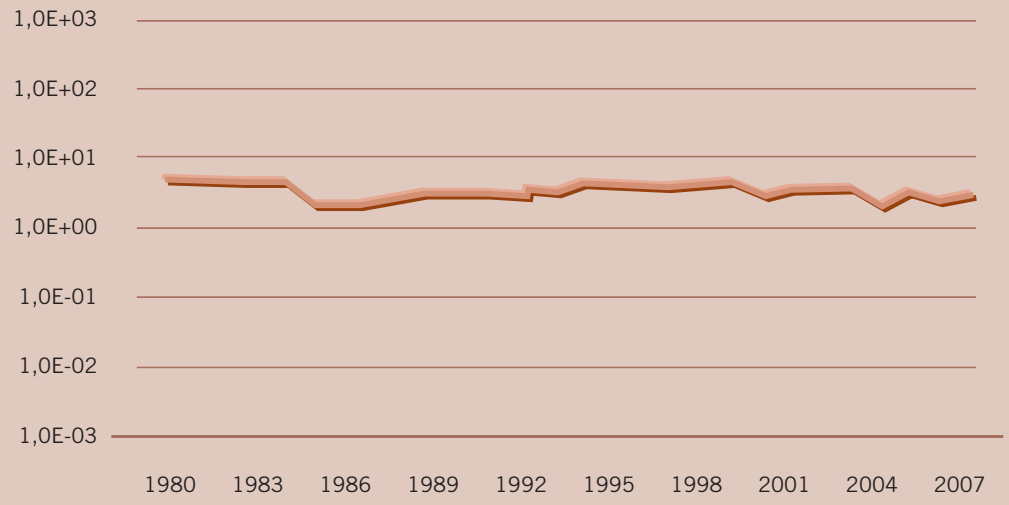
In 2008, a new campaign was launched, aimed at determining the natural radionuclides in a phosphogypsum preparation, with the participation of 34 Spanish and three overseas laboratories.

The active particle release event at Ascó I required a specific radiation surveillance process. This was based on two main activities: first, measuring radiation activity of all the people (professionals and visitors) who had been in the power plant from November 2007 to April 2008 and all those in the surrounding area who requested it. In total, more than 2,700 people were monitored, none of whom presented any sign of contamination. Secondly, an exhaustive programme was carried out to locate the active particles at the power plant site, a task handled by the licensee for areas under its control and by the CSN for off-site areas. More than 1,300 particles were collected with a total activity of 409 MBq, retrospectively calculated for 26th November 2007, the date of the emission.

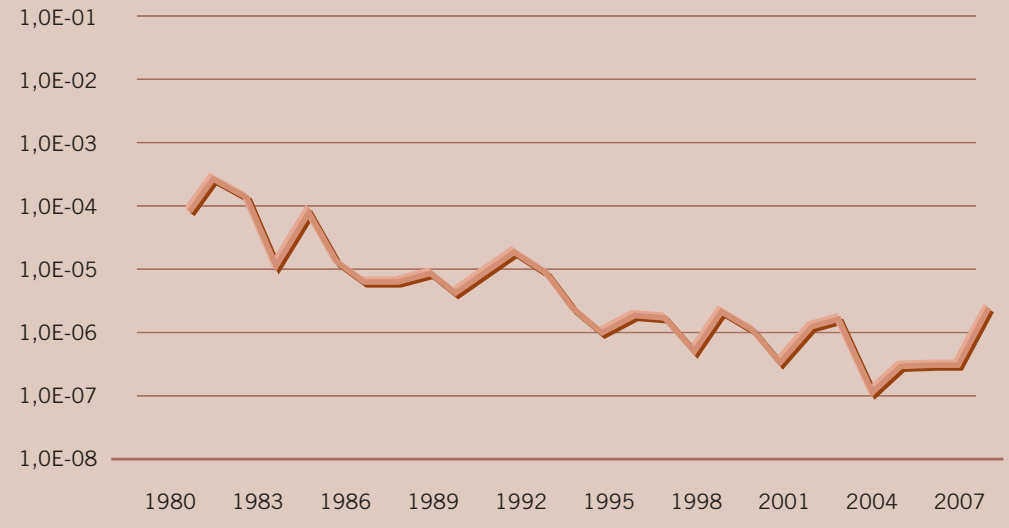
The CSN also controls the environmental radiological quality throughout Spain using its measurement networks: the Automatic Stations Network (REA), which continually measures the presence of radiation in the atmosphere, and the Sampling Stations Network (REM), made up of different laboratories which analyse river and coastal water samples, as well as samples of the atmosphere, the land and foodstuffs. The values obtained are similar to those for previous years and reflect acceptable radiological conditions.

Furthermore, the CSN supervises specific radiation surveillance programmes regarding exposure situations resulting from practices or accidents in the past. This is

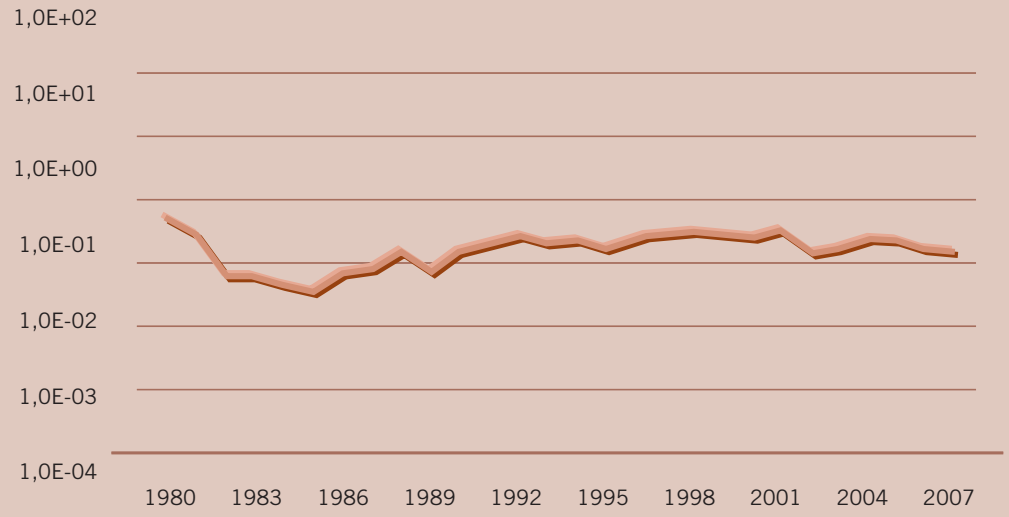
PWR plant liquid radioactive effluents. Tritium activity (GBq/GWh)



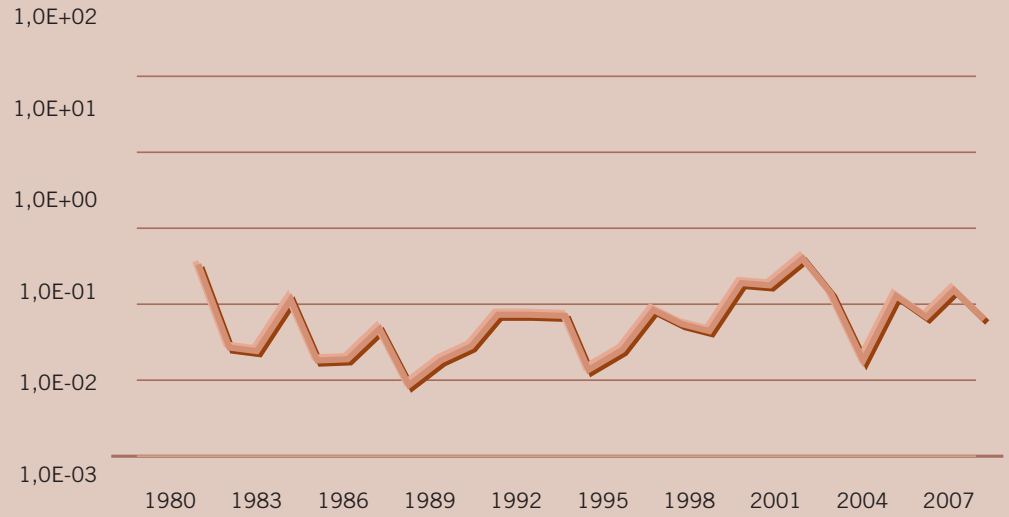
PWR plant gaseous radioactive effluents. Particle activity (GBq/GWh)



PWR plant gaseous radioactive effluents. Tritium activity (GBq/GWh)



BWR plant liquid radioactive effluents. Tritium activity (GBq/GWh)



the case of the surveillance programme carried out by Ciemat in Palomares (Almería), as a result of the dispersion of metallic plutonium due to a military air accident. The results of the monitoring programme carried out on people indicate that the accident posed no threat to the health of those living in Palomares. Furthermore, the Inert Materials Recovery Centre, located in Marismas de Mendaña (Huelva) now has a radiation monitoring programme as a result of the caesium-137 contamination event that occurred when wastes from the smelting of a radioactive source at an Acerinox plant in 1998 were accidentally received. Results show that the radiological impact of the contamination on the population and environment is not significant.

CSN network of continental and coastal water sampling stations

Other activities for the protection of the public and the environment

Epidemiological study

In accordance with an order from the Parliament, the CSN and the Carlos III Health Institute have been working together since 2006 to carry out an epidemiological study which investigates the possible effect of radiation exposure on the population living in the vicinity of nuclear, radioactive and nuclear fuel cycle facilities. During 2008, the CSN completed the historical reconstruction calculations of artificial and natural radiation doses in the municipalities included within the scope of the study, including control zones, and the Institute has started to analyse the mortality rate due to cancer in the areas studied.

CSN network of atmospheric and terrestrial sampling stations: dense and spaced networks

Laboratories:

1992
- Bilbao: ETSI I. y Telecom.
- Santander: U. de Cantabria
- León: U. de León
- Salamanca: U. de Salamanca
- Badajoz: U. de Extremadura
- Cáceres: U. de Extremadura
- Madrid. U. Politécnica de Madrid
- Sevilla: U. de Sevilla
- Málaga: U. de Málaga
- Granada: U. de Granada
- Valencia: U. de Valencia
  U. de Politécnica
- P. Mallorca: U. I. Baleares
- Tenerife: U. de la Laguna

1997
- Ciudad Real: U. Castilla-La Mancha
- La Coruña: U. Politécnica
- Oviedo: ETSI Minas
- Zaragoza: U. de Zaragoza

1997
- Ciemat
- Barcelona: U. Politécnica Cataluña

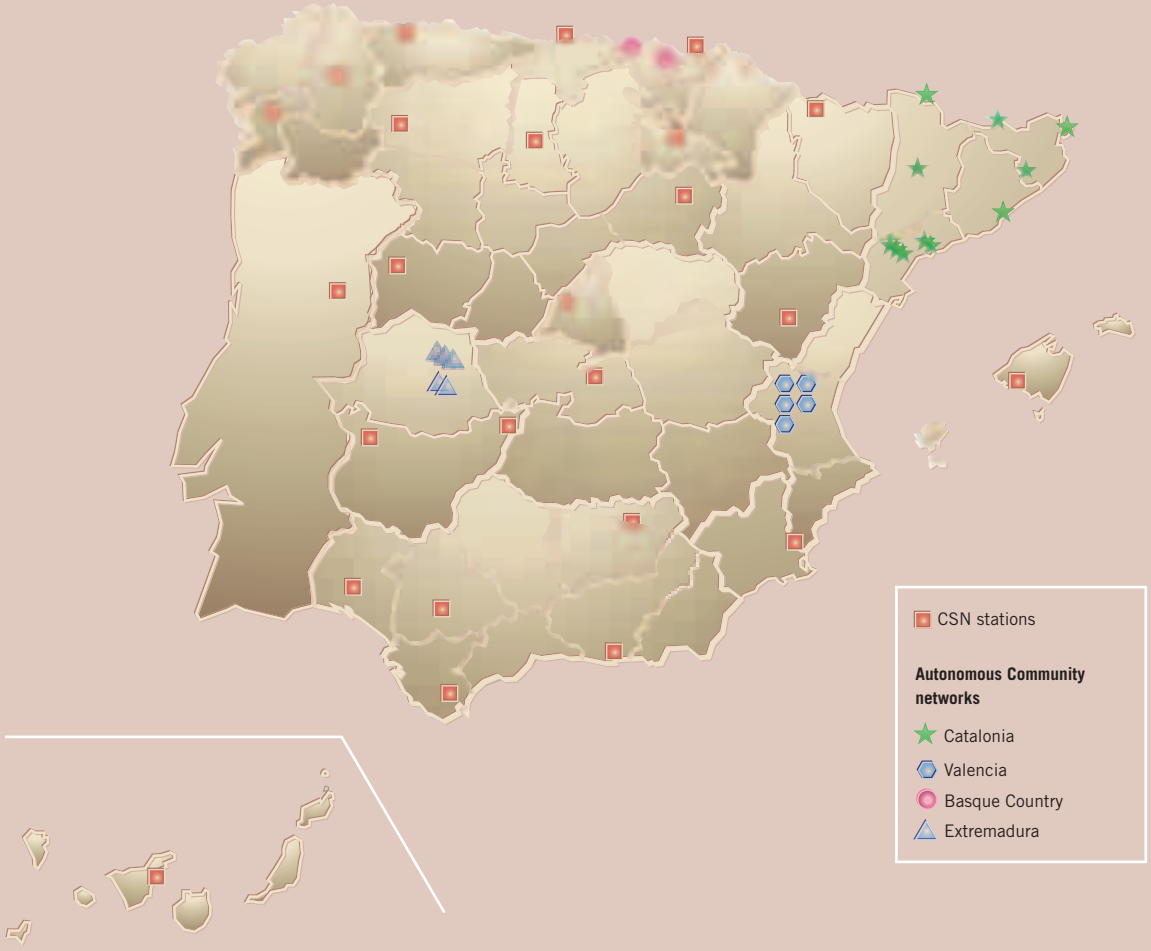
Given the progress and depth of the work and methodology, the study's Advisory Committee felt it was necessary to extend the deadline for project completion and for presentation of the final report to October 2010.

Protection against natural sources of radiation

The CSN offers advice to authorities and companies that carry out unregulated activities which involve exposure to natural radiation sources. The aim is to define the radiation risk and, where necessary, apply the suitable protection measures for workers and the public. To define this obligation and promote its fulfilment, the CSN launched a series of pilot studies in 2008 concerning significant industrial activities, such as, for example, coal-fired power plants, and completed the one on the manufacturing and use of thorium compounds.

Furthermore, homes in Galicia continue to be monitored for radon gas. There is also a study underway

Spanish environmental radiological surveillance network (Revira). Automatic stations network (REA)



in this region concerning the natural isotope content in public water supplies.

In the same way, and in terms of radiation protection, the CSN provides technical assistance to institutions for the recovery of land affected by industrial activities in the past and the associated accumulation of natural radioactive substances. An example is the work planned or underway at the Flix reservoir in Tarragona, the El Hondón reserve in Cartagena or the operation of the Casablanca oil rig, off the coast of Tarragona.

Personnel licences

With regard to qualifications for facility and organisation operation personnel, the Council granted 303 new supervisor licences, 885 operator licences and nine Radiation protection service manager licences. It also issued 90 supervisor licences and 174 operator licences, in addition to 536 supervisory accreditations and 1,548 accreditations to operate medical radiodiagnosis facilities. As of 31st December 2008, 9,452 workers were registered with a licence and 176 with a Radiation protection service manager diploma.

Furthermore, 38,839 workers had the corresponding CSN accreditation to supervise medical radiodiagnosis facilities and 54,877 to operate these facilities.

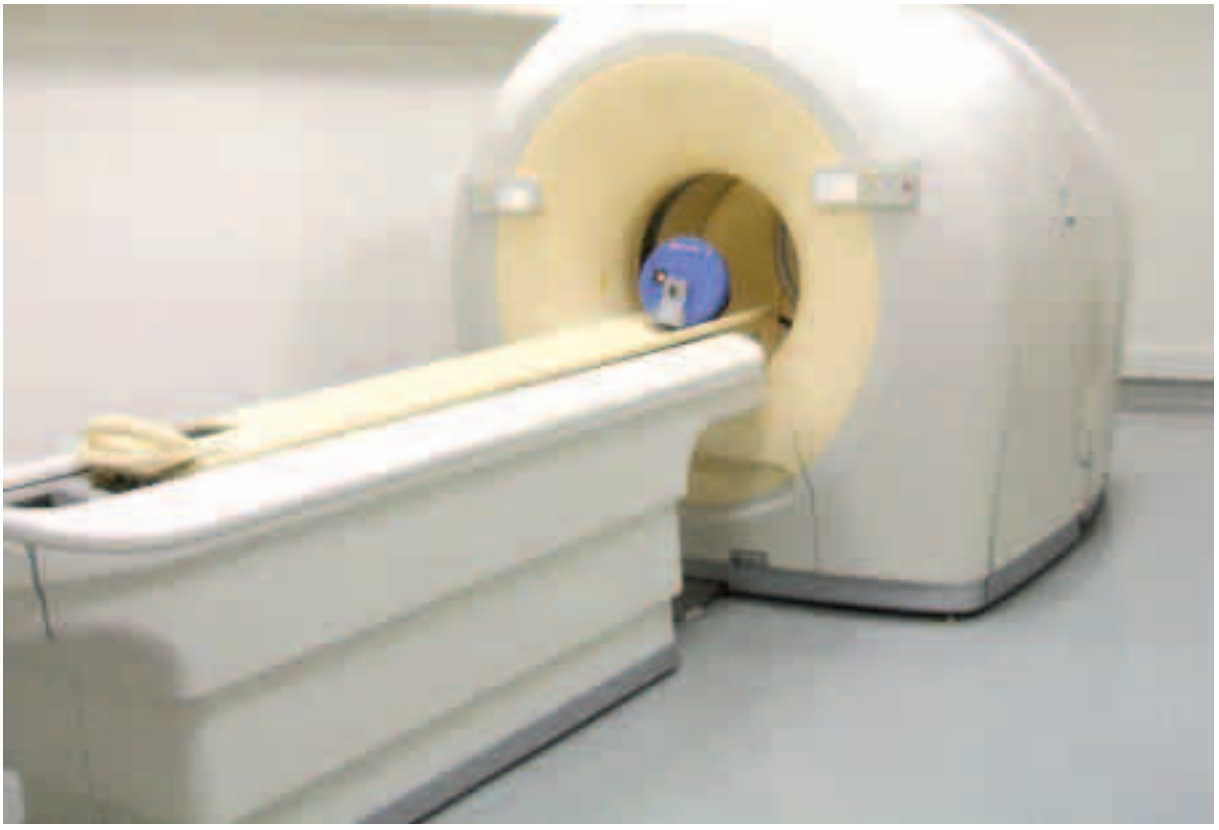
The CSN homologated two new courses to obtain licences and accreditations for radioactive facilities and a further two for X-ray facilities.

The CSN also authorised the modification of three courses for radioactive facilities and another for radiodiagnosis facilities. In order to monitor the teaching of the courses and subsequent exams, 118 inspections were conducted. It is important to point out that in 2008 the CSN IS-17 instruction was published with the aim of regulating the approval of accreditation courses for the granting of permits for the supervision and operation of radiodiagnosis facilities. The Council continues to update and provide sufficient educational material, via its official website, for teaching courses leading to licences and accreditations in all the fields applicable to radioactive and radiodiagnostic facilities.

Process control installation.

Service organisations

Different companies and organisations are involved in the Spanish regulatory system and are subject to authorisation and control, providing services to third parties in the field of radiation protection. These include radiation protection services (SPR), radiation protection technical units (UTPR), companies selling and providing technical support for medical X-Ray equipment, as well as personal dosimetry services. Controlling these companies means not only that it is possible to ensure their activities are correctly carried out but also allows for indirect control of all the facilities to which they provide their services. Throughout 2008, the CSN authorised five new radiation protection services and decommissioned two. It also authorised a new UTPR, modified the authorisation of another two, closed one and suspended the authorisation of another. Furthermore, 37 inspections were completed on such organisations, in collaboration with the relevant autonomous communities, with which the CSN has function assignment agreements. This year, there were 71 authorised SPR's and 47 UTPR's. It is worth highlighting that at the end of this year, a forum was



Medical diagnosis equipment.

created concerning the UTPR's, between the Council and the Spanish Radiation protection Society. The first of the working groups looking at the medical use of X-rays is already in operation.

The CSN also reported on the authorisation of 14 new technical support and sales companies, modified the permits of a further 12 and decided it was advisable to shelve two application processes. Furthermore, modification was approved for two external personal dosimetry services and, at the request of the licensees, one authorisation was revoked and another suspended for five years. 11 inspections were carried out on external dosimetry services and one on internal dosimetry services at Tecnatom. The technical groundwork was also established for the 2nd Intercomparison Project between Internal Personal Dosimetry Services in the nuclear sector.

As of 31st December 2008, a total of 1,110 companies were included on the external companies register, the majority of which operate in the nuclear power plant industry.

CHAPTER 4

Emergency preparedness

Part of the CSN's role is to ensure that the licensees of nuclear and radioactive power plants are able and prepared to cope with the emergencies that may arise. Furthermore, the CSN is part of the national emergency system for issues relating to nuclear safety and radiation protection. Its participation is defined by the Emergency Response Organisation (ERO) protocol and involves contributing technical and human resources, and collaborating with the emergency authorities. To provide this service, the CSN has an Emergency Room (Salem), which in 2005 was completely reformed and equipped with sophisticated redundant communications systems. The CSN's close collaboration with the Directorate General for Civil Defence and Emergencies (with which it shares the information from 903 automatic stations belonging to the Radioactivity

Emergency drill.

Alert Network), and with the Government delegations and subdelegations, the Military Emergencies Unit and the autonomous communities, ensures a quick and comprehensive response to any nuclear or radiological event.

The Salem is the Council's operations control centre for emergency response and makes it possible for information on an emergency to be obtained and analysed, carrying out estimations on its development and the effectiveness of the measures used. To accomplish this, it has a series of telecommunications systems, real-time operation and radiation parameter monitoring equipment and powerful calculation and simulation resources, all available to a group of highly specialised experts. During 2008, the Salem received three pre-alert notifications and in two cases the CSN Emergency Response Organisation was activated in mode 1 (of the three existing modes).

The Salem operates 24 hours a day, 365 days a year and is constantly manned by a technician and a telecommunications officer. In the event of activation, there is also an emergency stand-by team consisting of 14 specialised individuals who can be present in less than an hour.

The Emergency Response Organisation can have two mobile environmental radiation monitoring units and a mobile internal personal dosimetry service available for use at any location in Spain to measure the radiation dose of potentially contaminated people. The CSN has also issued 3,000 direct-reading dosimetric electronic devices (EPD) and 28 reading units for the personnel intervening in the five off-site nuclear emergency plans.

In 2008, the first technical committee meeting was held to monitor the specific collaboration agreement between the CSN and the Ministry of the Interior's Directorate General for Civil Defence and Emergencies, signed in 2007, in which it was agreed that training activities would be promoted for nuclear and radiological emergencies and general drills would be carried out. The CSN has also worked in close

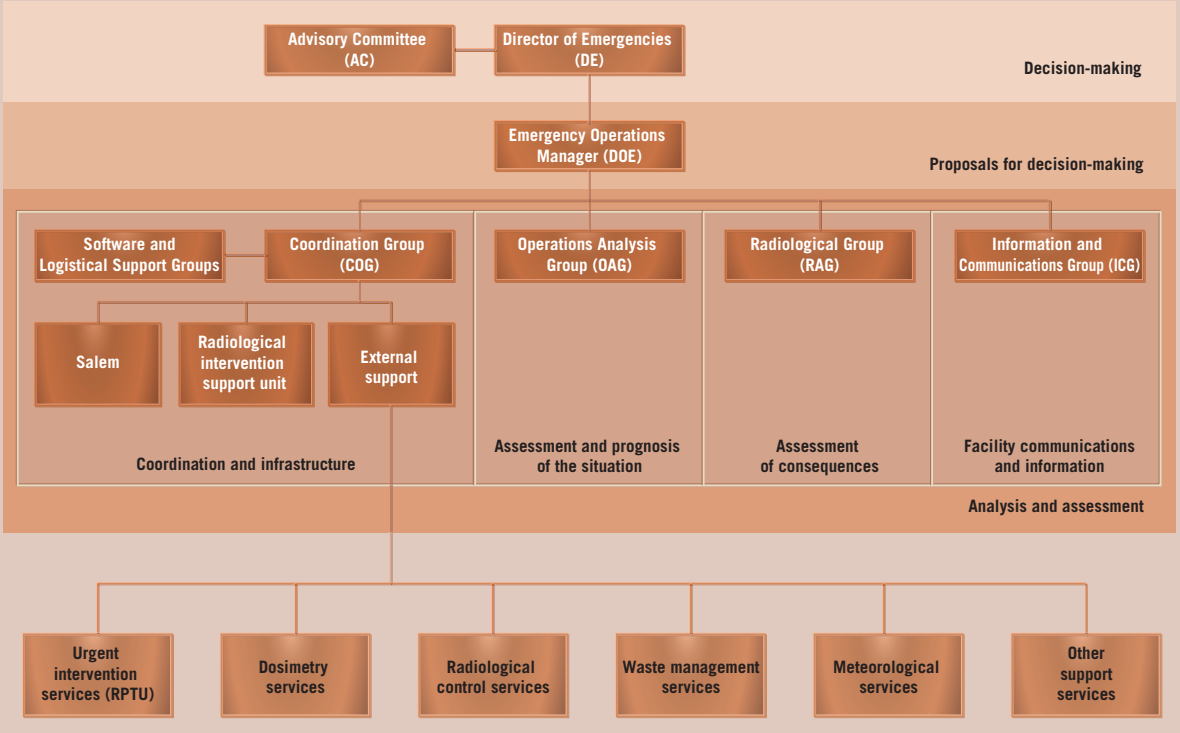
collaboration with the Military Emergencies Unit, for the design, preparation and execution of drills. Furthermore, a collaboration agreement was established with the Regional Government of Catalonia concerning planning, preparation and response to emergency radiation situations and the training of specialists from the Ministry of the Interior and Ministry of Defence.

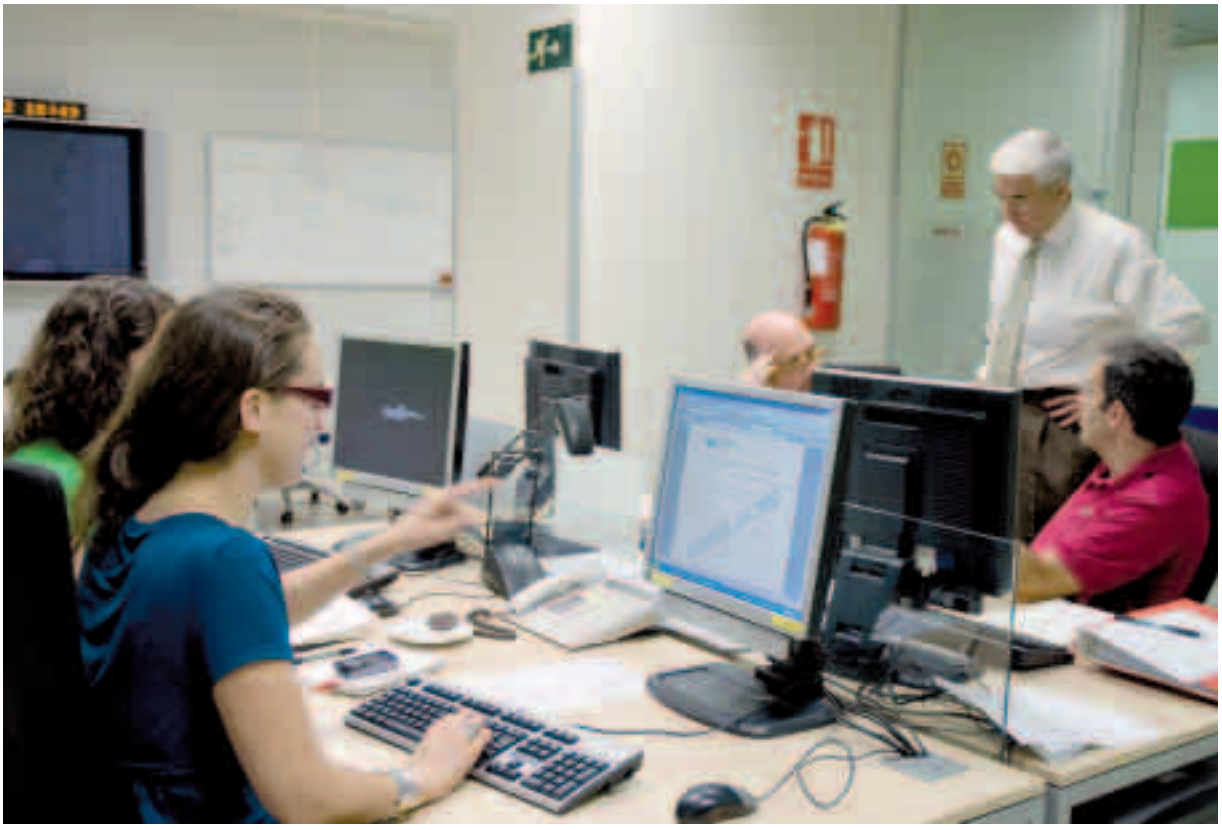
As in previous years, all the nuclear power plants and facilities have carried out site emergency drills, under supervision by the CSN, as detailed in their respective Site Emergency plans. These drills have been used to train specialised CSN staff, as well as to test the performance of the Salem systems, and have also made it possible to test the coordination mechanisms with Government delegations, the Directorate General for Civil Defence and the municipalities involved.

In 2008, a draft safety guide was drawn up on the contents of the Site Emergency Plan (PEI) for any type of radioactive facility and proposals for modifications to the PEI's of various nuclear facilities were evaluated.

In terms of international emergency preparedness, the CSN has participated in four European Union Ecurie exercises and four international exercises of the International Atomic Energy Agency *(IAEA)*.

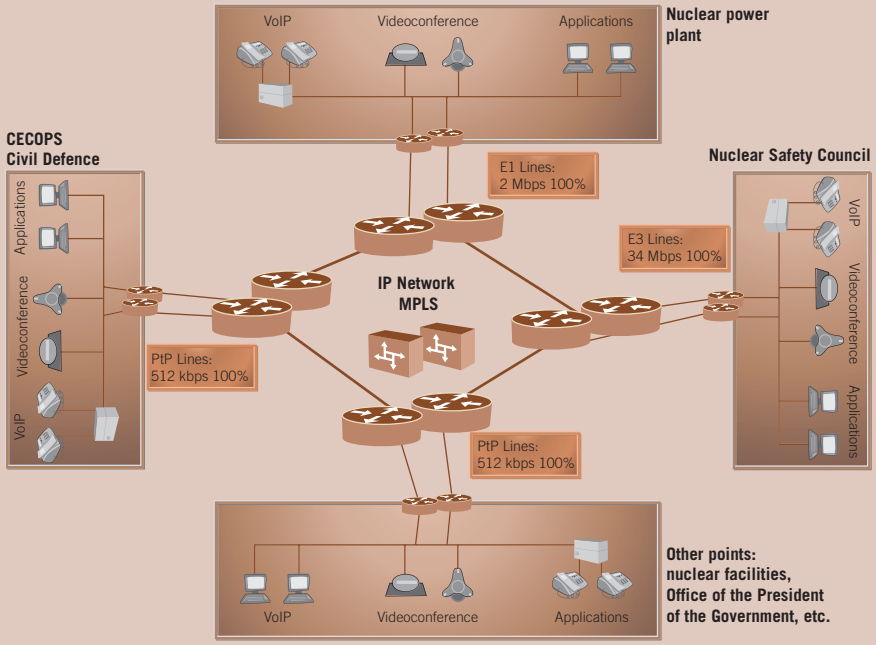
Organisational Flowchart of the CSN Emergency Response Organisation

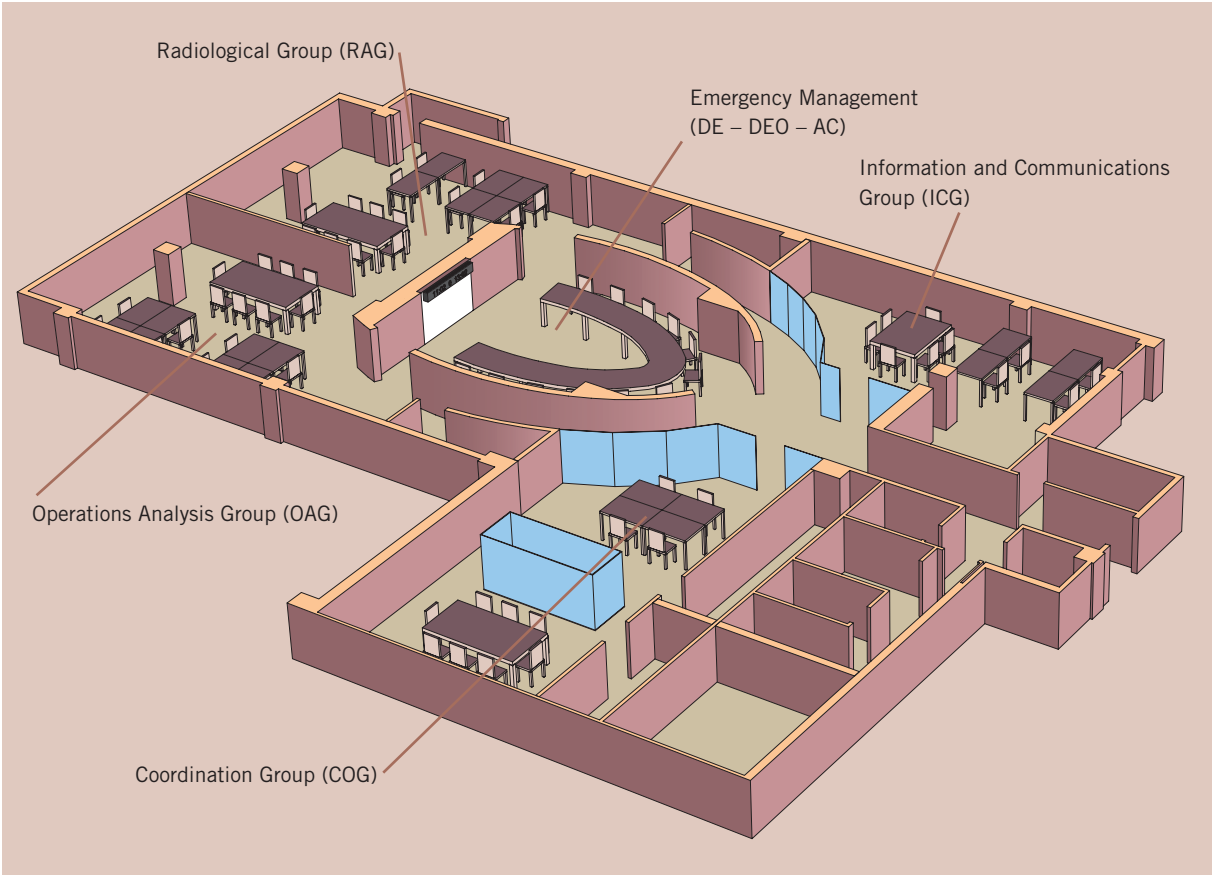




CSN personnel working during an emergency drill in the Salem.

Salem Communications





Physical protection of nuclear materials and facilities

In 2008, with regard to the physical protection of nuclear materials and facilities, the CSN supervised the adaptation of the aforementioned facilities to the CSN IS-09 instruction on Security. With regard to regulations, the CSN participated in the interministerial working group for the adaptation of Royal Decree 158/1995 to the Amendment of the IAEA's Convention on Physical Protection.

Within the European Nuclear Security Regulators Association, the Council has joined a working group aimed at standardising the security criteria for radioactive facilities with high activity sealed sources. It has also collaborated with different Spanish and overseas institutions in training and knowledge exchange activities relating to the security of nuclear and radioactive materials and facilities. Its collaboration with the Secretariat of State for Security regarding the preparation and performance of the *FTX 08* field exercise associated with the global initiative against nuclear terrorism has been particularly noteworthy.

The CSN has also inspected the security systems in place at Ascó and Vandellós II nuclear power plants, the ATI dry fuel storage facility at the José Cabrera nuclear power plant, the disposal facility at El Cabril, the Juzbado facility, the Ciemat nuclear facility and the irradiation radioactive facility at Aragogamma S.A.


CSN
SALEM

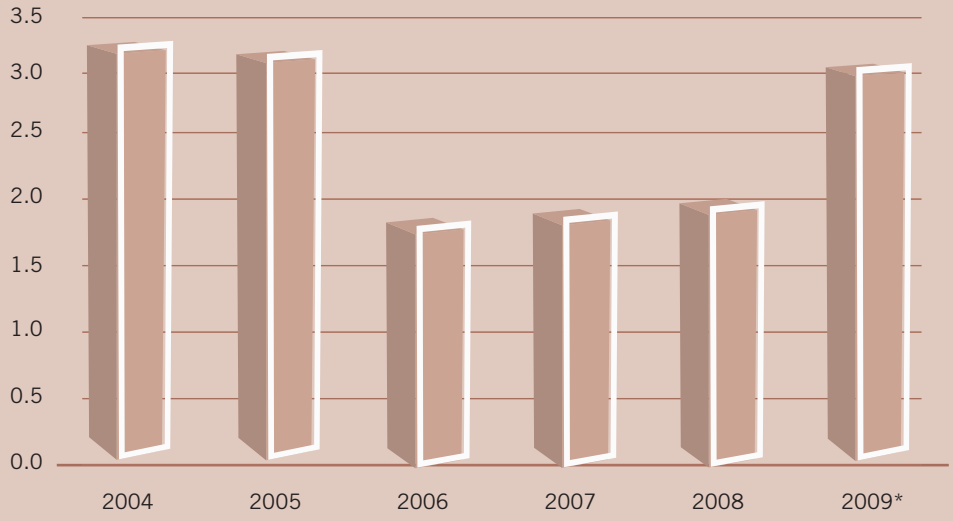
CHAPTER 5

Research and Development

The CSN does not directly carry out research and development activities, but does promote and fund projects concerning nuclear safety and radiation protection, with the aim of ensuring that its regulatory work remains technically independent. These activities are detailed in four-year plans. In 2008, the 2008-2011 Plan was approved, with the following objectives:

- To contribute to ensuring a high degree of nuclear safety and radiation protection at existing facilities, until they reach the end of their service lifetime.
- To improve the monitoring and inspection of the exposure of workers and the public to ionising radiations.
- To continue to progress in the development of radiation protection in medical exposure.
- To ensure the availability of the knowledge and

Evolution of CSN R&D+i budget from 2004 to 2009



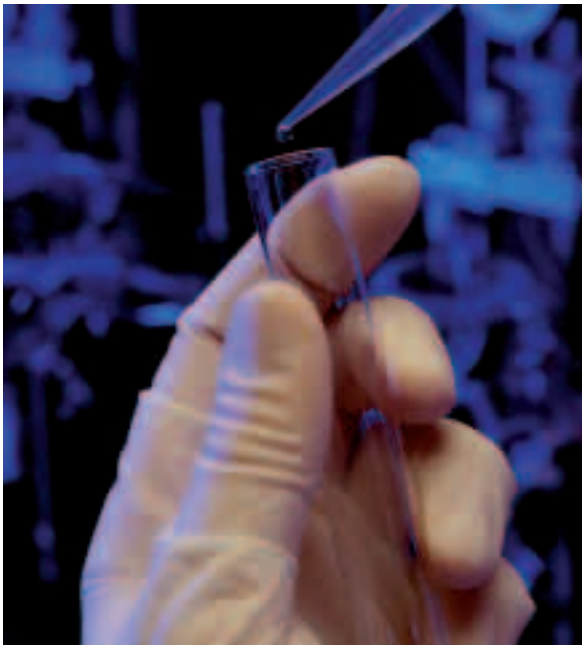
* Forecast.

technical resources required to determine, prevent and minimise the risks associated with future facilities.

This plan is built on the following eight programmes or courses of action:

- Nuclear fuel and reactor physics programme.
- Programme for safety assessment modelling and methodology.
- Materials behaviour programme.
- New technologies programme (design of new reactors).
- Radioactive waste programme.
- Programme for the control of exposure to radiations.
- Dosimetry and radiobiology programme.
- Emergency management and incident analysis programme.

At the start of the year, 34 projects which had started in previous years were underway within the framework of the CSN R+D Plan; of which 13 were completed in 2008, with nine others being introduced. In total, the budget for these activities reached 2.1 million Euros. Furthermore, the Council made a new announcement regarding the awarding of grants for R+D projects, which will run for three years.



In 2008 the CSN set aside 2.1 million Euros for R&D.

R+D projects in 2008

Title of the R+D Project	Start	Finish	Investment	2008-2011	Dept CSN
Specific agreement between NRC and CSN regarding Nuclear Safety Research (R+D Agreement).	21/09/2006	20/09/2011	270,797 €	1	OFID
Analysis and simulation of PKL and ROSA experiments. Application to Spanish nuclear power plants (CAMP Spain).	01/10/2005	31/12/2009	395,094 €	2	STN
Safety Margin Assessment Application SM2A.	15/10/2008	14/10/2011	109,976 €	2	STN
Application of advanced assessment techniques for nuclear power plant electrical cables. (Cable phase II).	01/09/2005	30/03/2009	156,601 €	3	SIN
Use of the José Cabrera reactor vessel internals. Preparation phase of the Research project (Zorita Project, ZIRP).	18/03/2008	31/12/2009	80,643 €	3	OFID
Behaviour of BWR fuel under storage and transport conditions.	14/11/2008	31/10/2011	310,095 €	1	STN
Thermomechanical behaviour of high burnup fuel	24/09/2007	23/09/2011	415,972 €	1	STN
Content and migration of radiostrontium and radiocaesium in Spanish soil.	01/07/2004	01/07/2008	326,600 €	6	SRA
National Agreement for the FIRE International Records Exchange Project (Phase2).	05/10/2007	31/12/2009	0 €	2	STN
National Agreement for the ICDE-2 Project *(Common-Cause Failure Data Exchange).*	01/04/2008	31/03/2012	0 €	2	STN
National Agreement for the participation of national organisations in the NEA Halden Project (2006-2008).	01/01/2006	31/12/2008	295,568 €	4	OFID
Agreement for Spanish participation in the construction and operation project for the Jules Horowitz research nuclear reactor.	15/01/2007	21/12/2011	400,000 €	4	OFID
Development of Best-Estimate Methods – Uncertainty and Sensitivity Evaluation (Bemuse).	30/12/2004	31/12/2008	396,894 €	2	STN
Biological effect of ionising radiations: quantification of reciprocal translocations.	01/07/2004	01/07/2008	288,617 €	7	SRO

R+D projects in 2008 (continued)

Title of the R+D Project	Start	Finish	Investment	2008-2011	Dept CSN
Analysis of Ra-226, Rn-222 concentrations, alpha and total beta coefficients and H-3 content in mineral water, spring water and drinking water in Galicia.	01/10/2005	01/10/2009	207,380 €	6	SRA
Analysis of thorium exposure in non-radiological industries.	01/07/2004	01/07/2008	184,140 €	6	SRA
Analysis of extremity dosimetry techniques and calibration and characterisation methods.	29/12/2007	29/12/2009	90,445 €	7	SRO
Analysis of radiation damage caused by secondary electrons in biomolecular systems.	01/08/2004	01/12/2009	82,000 €	7	SRO
Analysis of the radiological impact of coal-fired power plants on the surrounding areas.	28/07/2004	27/01/2009	304,216 €	6	SRA
Analysis and evaluation of the radiological impact of the activities of various non-nuclear industries in the south of Spain.	01/07/2004	01/07/2008	136,246 €	6	SRA
Fire safety evaluation using codes and modelling methods.	01/07/2004	31/07/2008	160,000 €	2	SIN
Code Applications and Maintenance Program.	31/08/2003	30/08/2008	175,000 €	2	STN
Fire propagation in elementary, multi-room scenarios (PRISME) Project.	01/01/2006	31/12/2010	250,000 €	2	SIN
R+D of nuclear safety in nuclear power plants. Environmental radiological impact.	01/11/2008	01/11/2012	320,000 €	2	STN
Impacto radiológico sobre el medio ambiente.	01/07/2004	01/07/2008	42,000 €	6	SRA
Implementation of systems to eliminate natural radioactive content in drinking water.	02/10/2007	01/10/2010	100,166 €	6	SRA
Implementation of a neutron metrology system in Spain (Neutron Laboratory).	29/11/2005	30/06/2011	623,000 €	7	SRO
Nuclear engineering and thermohydraulics.	01/06/2008	31/05/2012	320,000 €	2	STN
Structural integrity of nuclear fuel cladding embrittled by hydrides during temporary dry storage thermomechanical processes (Hydrides Project).	21/09/2007	01/12/2009	30,000 €	1	STN

R+D projects in 2008 (continued)

Title of the R+D Project	Start	Finish	Investment	2008-2011	Dept CSN
Interaction of secondary electrons with matter and application in radiation damage.	01/09/2004	01/09/2008	63,909 €	7	SRO
Radon contamination map for homes in Galicia.	01/11/2005	17/05/2009	75,876 €	6	SRA
Melt Coolability and Concrete Interaction Project (MCCI-2).	01/04/2006	30/06/2009	121,177 €	2	STN
Modelling and calculation of maintenance and human actions in the analysis of precursors	01/10/2005	01/10/2009	325,448 €	8	STN
PHEBUS FP – Assimilation of results.	01/07/2004	01/07/2008	332,500 €	2	STN
The CABRI Water Loop Project.	01/01/2005	31/12/2011	237,804 €	1	STN
The FIRE (Fire Incident Records Exchange) Project (FIRE 2 approved and extended).	01/01/2006	31/12/2009	24,900 €	2	STN
The ICDE (Common-Cause Failure Data Exchange) Project.	01/04/2005	01/04/2008	41,777 €	2	STN
The ICDE-2 (Common-Cause Failure Data Exchange) Project.	01/04/2008	31/03/2011	34,500 €	2	STN
The OPDE Project (Piping Failure Data Exchange).	31/05/2005	31/05/2008	54,930 €	3	SIN
The OPDE (Piping Failure Data Exchange) Project (Phase 3).	01/06/2008	31/05/2011	13,500 €	3	OFID
The PKL-2 (Primär Kreislauf) Project.	30/04/2008	30/09/2011	108,000 €	2	STN
The ROSA (Rig Of Safety Assessment) Project (ROSA validated).	01/04/2005	31/03/2009	130,500 €	2	STN
The SCIP Project (Studsvik Cladding Integrity).	01/07/2004	30/06/2009	330,095 €	1	STN

OFID: Oficina de Investigación y Desarrollo (Research and Development Department).
STN: Subdirección General de Tecnología Nuclear (Sub-directorate General for Nuclear Technology).
SRA: Subdirección General de Protección Radiológica Ambiental (Sub-directorate General for Environmental Radiation protection).
SRO: Subdirección General de Protección Radiológica Operacional (Sub-directorate General for Operational Radiation protection).
SIN: Subdirección General de Instalaciones Nucleares (Sub-directorate General for Nuclear Facilities).


FRAGILE

CHAPTER 6

Institutional relations

In order to ensure the better and more efficient of its assigned functions, the CSN maintains a wide range of relationships with public institutions, at state, regional and local levels. This involves collaboration and cooperation in shared and convergent responsibilities, as well as offering advice and facilitating understanding and control of its own activities. Furthermore, it remains in constant contact with professional and union organisations and with non-governmental organisations and associations with links to its areas of activity.

The Council reports annually to Parliament, issuing a report which provides a detailed account of the activities carried out throughout the year. With the introduction of Law 33/2007, this obligation has extended to the regional parliaments of the autonomous communities

with nuclear power plants. The president of the Council, Carmen Martínez Ten, appears every year before the Congress and the Senate to present the report detailing the CSN's activities. In addition to this annual appearance, the CSN may also appear to report on other specific events or matters. Thus, on 11th June 2008, the president appeared before the Industry, Tourism and Trade Committee to report on the particle emission event at Ascó I plant.

As part of its relationship with Parliament, the CSN replies to parliamentary questions posed by different political groups from both the Congress and the Senate. During 2008, 30 parliamentary questions were answered and a response was given to 32 resolutions relating to the Annual Report for activities in 2006, 13 resolutions relating to previous annual reports and five relating to the incident at Vandellós II on 25th August 2004.

A particularly significant event in 2008 in the context of the relationships which the CSN has with the Central State Administration was the signing with the Ministry of Education of an addendum to the agreement on training for teachers, participation with the Ministry of Industry, Tourism and Trade in the annual meeting with representatives from autonomous communities with transferred responsibilities and services relating to 2nd and 3rd category radioactive facilities and participation in the meeting between the aforementioned ministry and representatives of the electricity sector to analyse the situation of safety and investments at the Spanish nuclear power plants. With the Ministry of the Interior, a joint committee has been created to monitor the framework agreement concerning emergency and physical protection management and a Technical Committee for monitoring of the specific agreement signed with the

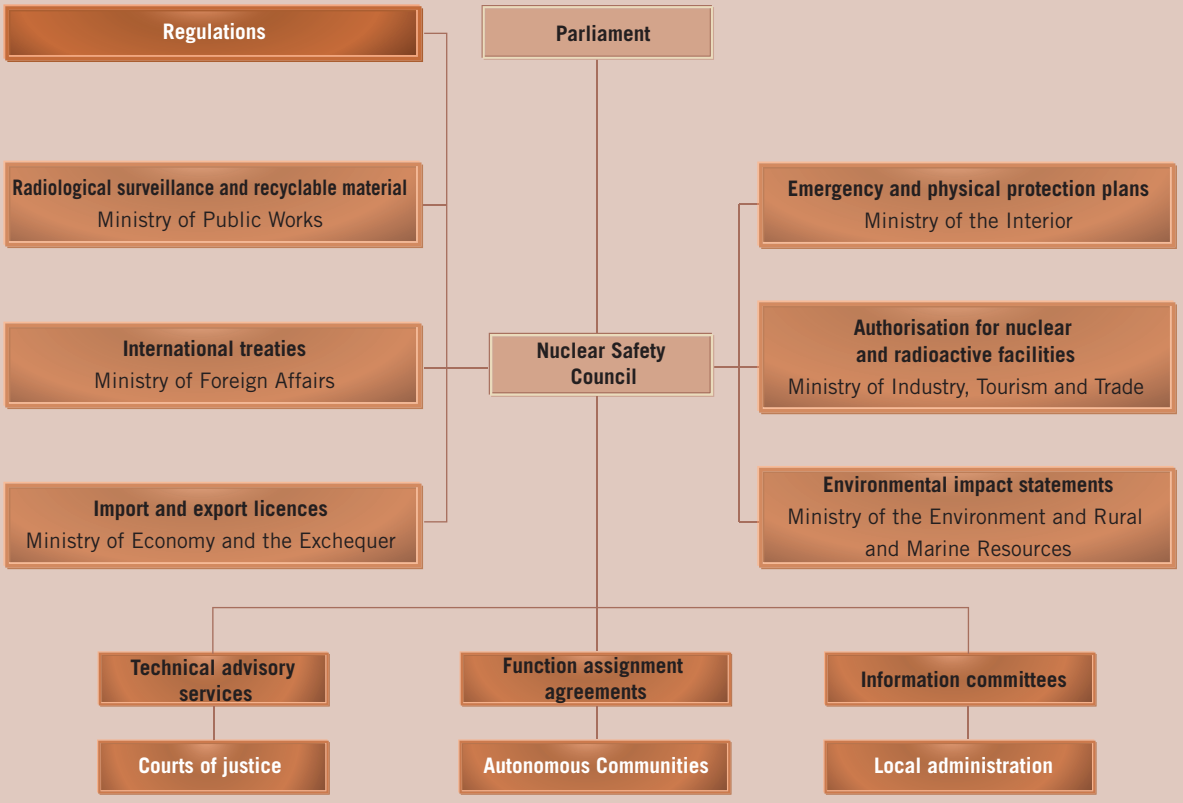
Signing of an agreement with the Regional Government of Catalonia.

Directorate General for Civil Defence and Emergencies. Finally, it is worth highlighting the meetings held with the Ministry of Science and Innovation to monitor the collaboration agreement with the Carlos III Institute of Health for the performance of an epidemiological study in areas surrounding Spanish power plants.

The CSN continues to work in collaboration with the autonomous communities through the function assignment agreements. In 2008, valid agreements were in force with Asturias, Catalonia, Galicia, the Balearic Islands, the Canary Islands, Murcia, Navarre, the Basque Country and Valencia. A collaboration agreement was also signed with the Regional Government of Catalonia concerning planning, preparation and response in radiological emergency situations.

With regard to local authorities, the CSN actively collaborates with those municipalities with nuclear power plants, taking part in local informative committee meetings, which in 2008 were held in the areas of influence of Ascó, Almaraz, José Cabrera and Trillo plants. The information committees of Cofrentes, Trillo, Almaraz, José Cabrera, Ascó, Vandellós II and Santa María de Garoña plants also met. A meeting was also held with the Association of Municipalities with Nuclear Power Plants (AMAC), and in collaboration with this association a study was performed on public opinion of nuclear energy and its related organisations.

CSN institutional relations



Autonomous communities with which the CSN has signed function assignment agreements

The CSN also collaborates with social organisations that are interested in its area of activity, such as trade unions, professional associations and non-governmental organisations. In 2008, there was a meeting of the CSN-Unesa Liaison Committee and contacts were held with the State Coordinator of Nuclear Power Plant Company Committees and the National Confederation of Nuclear Power Plant Company Committees. A meeting was also held with the executive committees of the Spanish Recovery Industry Federation (FER) and the Steel Companies Union (UNESID) to organise the International Conference on Control and Management of Inadverted Radioactive Material in Scrap Metal, to be held in Tarragona in February 2009.

In meeting its obligations, the Council provided a wealth of information at the request of different non-governmental environmental protection organisations, and held meetings with some of them, such as Greenpeace, Adena, Ecologistas en Acción and Adenex, responding to environmental questions such as the situation at the Inert Materials Centre at Marismas de Mendaña (Huelva) and an incident at Almaraz power plant.

Finally, the CSN awarded a total 57,000 Euros to eight projects selected for aid to support training, information and communication activities relating to nuclear safety and radiation protection.

CHAPTER 7

International relations

The CSN represents Spain internationally with regard to nuclear safety and radiation protection, both through advisory services to the Government and representation of the State in bilateral and multilateral relationships.

The CSN's international activities may be classified in three groups: those resulting from compliance with Spanish legal obligations in international treaties and agreements, collaboration and exchanges with regulatory organisations from other countries and, finally, technical activities aimed at increasing national knowledge and experience through participation in specialist forums or multinational R+D programmes.

Given their volume and relevance, the CSN's activities within the International Atomic Energy Agency represent the most important aspect of the Council's international commitment. In addition to its budget contribution of 498,000 Euros for nuclear safety and radiation protection assistance projects (particularly in Latin American and North Africa), in 2008 the CSN fostered cooperation in the Mediterranean Area to strengthen regulatory infrastructures for the control of radioactive sources in countries of North Africa (Algeria, Egypt, Libya, Mauritania, Morocco and Tunisia). The CSN also took part in a coordination meeting with France, Italy and the IAEA to define the basis of this cooperation. Within the framework of collaboration with the IAEA, the Council organised an international seminar on IRRS missions in Seville in November 2008 and organised an International Conference on Control and Management of Inadverted Radioactive Material in Scrap Metal, held in Tarragona in February 2009.

The IAEA hosts various conventions such as the Convention on Nuclear Safety, the Convention on the Safety of Spent Fuel Management and the Safety of Radioactive Waste Management, and the periodic reports to be submitted by the signatory countries are presented and debated at its headquarters. The CSN presented the 4th National Report within the framework of the 4th Review Meeting relating to the first of the aforementioned conventions, held in Vienna in April 2008, and took part in the drawing up of the 3rd National Report for the second convention.

At European level, the CSN participated in the European Nuclear Safety Regulator Group (ENSREG), previously known as the High Level Group, whose objective is the harmonisation of practices relating to nuclear safety and waste management. On this topic, the European Commission presented a proposal for a directive on nuclear safety in the European Union Council Atomic Questions Group. Also, at European Union level, the CSN has taken part in the regulatory assistance project for third party countries, and specifically, the regulatory body of Ukraine, for issues relating to personnel training, emergencies and regulation development programmes.

Furthermore, the CSN has attended various meetings organised by the heads of European Radiation Control Authorities (HERCA) relating to the analysis of new international regulations on radiation protection and the development of work on the revision and unification of European Union directives regarding the issue.

International meeting at the IAEA headquarters in Vienna.

The regulatory body has actively participated in international collaboration programmes promoted by the Nuclear Energy Agency (NEA) of the OECD, taking part in 14 research projects, both financially and by supplying technical support.

The CSN is a member of the associations which bring together the most prominent regulatory bodies from across the globe, the Western European Nuclear Regulators Association (WENRA) and the International Nuclear Regulators Association (INRA). In 2008, WENRA hosted

CSN participation in international organisations

European Union

- European Council advisory group.
- Commission advisory working groups.
- Working groups for specific issues.
- Subject-specific networks.

International Atomic Energy Agency (IAEA)

- Management groups.
- Working groups.
- Expert missions.
- Technical committees.
- Advisory committees.
- Grand holders and scientific visits.

Nuclear Energy Agency (NEA)

- Committees.
- Working groups.
- Research projects.
- Seminars and conferences.

CSN

Bilateral agreements

- 19 general agreements.
- 3 specific agreements (USA, France and Russia).

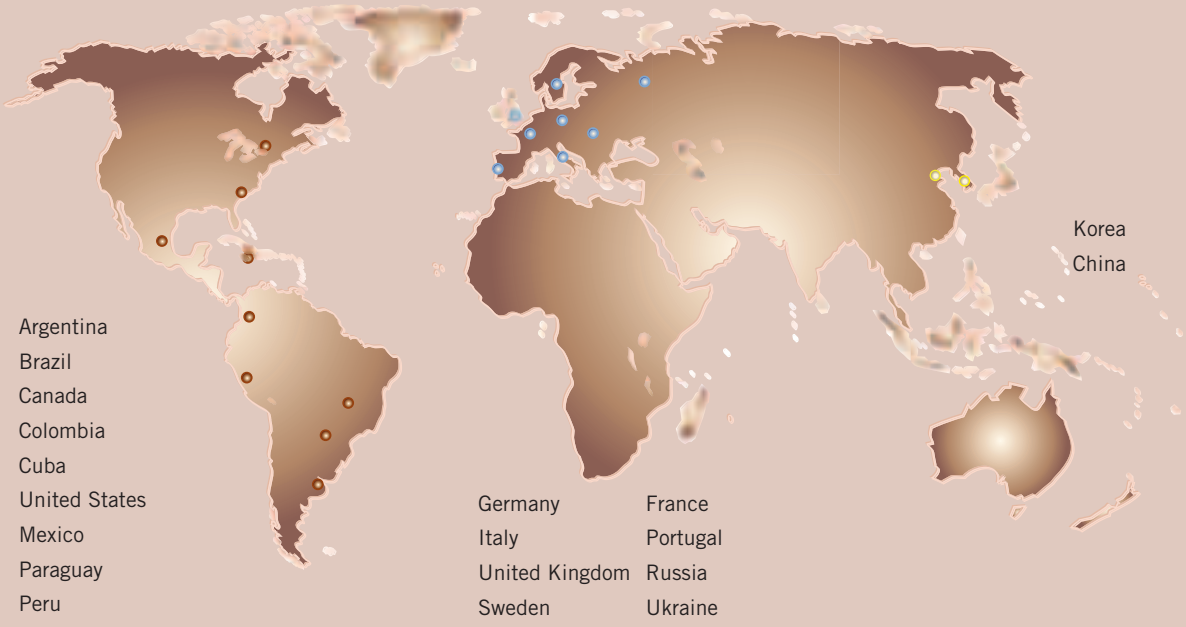
International conventions

- Convention on Nuclear Safety.
- Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management.
- Convention on the Physical Protection of Nuclear Materials.
- Convention for the protection of the Marine Environment of the North-Eastern Atlantic.
- Convention on the Prompt Notification of Nuclear Accidents.
- Convention on Mutual Assistance in the event of a Nuclear Accident or Radiological Emergency.

Otros foros

- INRA.
- WENRA.
- FORO.

Bilateral agreements map



two plenary meetings, in Bucharest and Prague, during which the projects under way were analysed, a proposal was made for a project concerning new reactors and the relationship with ENSREG and in particular with the European directive proposal concerning nuclear safety was discussed. The Council also actively participated in two six-monthly INRA meetings, held in Washington and San Antonio (USA), which considered issues such as nuclear emergency preparedness, the need for an international operating experience system, problems with the international supply of radioactive isotopes, the degradation of structural materials at nuclear power plants and the lack of a safety culture in operator companies.

The CSN is also a member of the Iberoamerican Radiological and Nuclear Regulators Forum (FORO) and took part in the plenary meeting held in Montevideo (Uruguay), at which both the projects under way and the budget for 2009 were approved.

In addition to its participation in multinational bodies, the Council also has bilateral cooperation agreements with 22 regulatory bodies from 19 countries. The most noteworthy, due to the frequency of the contacts and the relevance of the topics dealt with, are the agreements signed with the US Nuclear Regulatory Commission (NRC) and the French Nuclear Safety Authority (ASN). In the first case, in 2008 the CSN took part in the *Annual Regulatory Information Conference,* where the presidents of both bodies met and collaboration was specified in terms of the management of the service lifetime of power plants and the exchange of information relating to communications with the public. With regard to the ASN, CSN technicians participated in inspection performed by the French regulator and the policy of exchanging staff between the two organisations was maintained. Finally, the CSN hosted a visit from the Chinese regulatory organisation in order to renew another bilateral agreement, reaching a tentative agreement which might be confirmed in 2009.

Public information and communication

CHAPTER 8

The CSN's most important mission is to guarantee that people and the environment are protected against radiation, but an essential part of this objective includes working with maximum transparency to ensure that the public remains duly informed. In order to achieve this objective, the Council has communication and public information departments, through which it is possible to publicise the CSN's work, disclose technical information and promote public participation and dialogue with society. The CSN's efforts in this area are aimed at improving how information is shared, with the utmost accuracy and independence, making use of the

possibilities offered by new information and communications technologies.

To take this task a step further, the creation of an Advisory Committee for Information and Public Participation is planned, in accordance with the requirements of Law 33/2007. The committee's duties will be detailed in the new CSN Statute. It will be responsible for making recommendations in order to ensure and improve transparency, as well as proposing measures which encourage access to information and the participation of the public in matters included within the realm of competence of the CSN.

With regard to communications, one of the most important means is the website, which received a total of 201,783 hits in 2008. Throughout the year, the CSN paid special attention to updating the website, by developing a new, clearer and more accessible site, ready to operate at the start of 2009. This new website strengthens the Council's "open doors" policy and addresses all information requests, from the media, institutions and individuals.

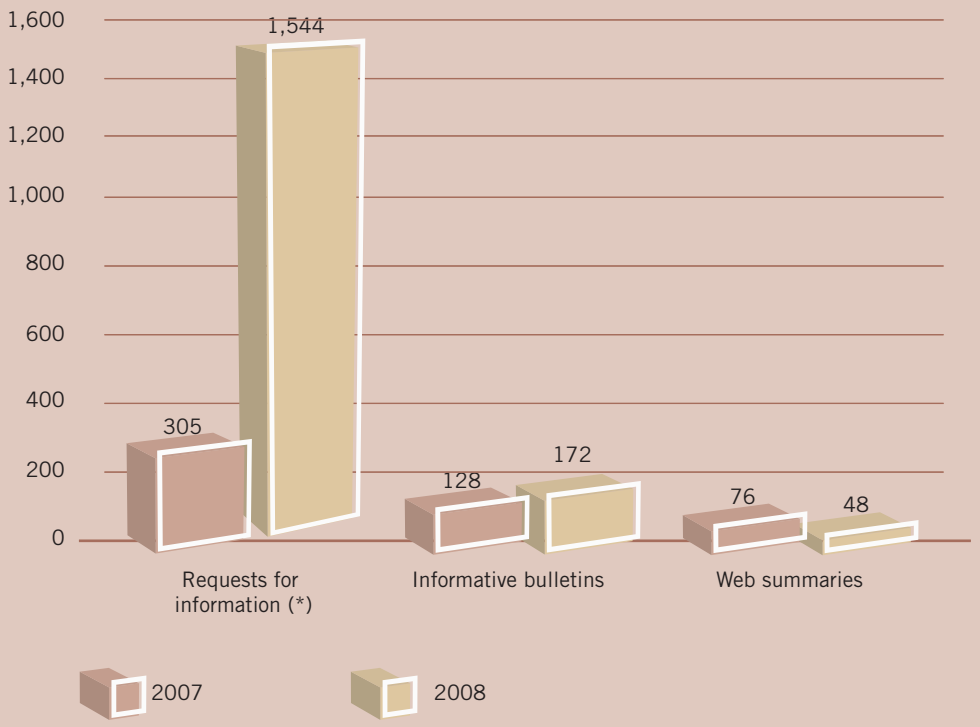
Interior of the CSN Information Centre.

The institutional website provides interest groups and the general public with documents which offer detailed information on the work done by the Council, including the minutes of plenary meetings, inspection reports and other useful information such as: publications, current regulations, replies to parliamentary questions, the operating status of the nuclear power plants, events reported by the licensees of nuclear and radioactive power plants and the environmental values collected by the environmental monitoring stations located across Spain. Furthermore, it is possible to access the Integrated Plant Supervision System (SISC), a tool which provides information on the safety of Spanish nuclear power plants in an objective, precise, understandable, concise and exhaustive manner.

Also, with the objective of maximum informative transparency, the CSN also ensures that lines of communication remain permanently open with the public through external consultations. During 2008, the CSN answered 963 queries and 207 requests from different publications through the website. With regard to contacts with the media, there were over 1,500 requests for information from media professionals and 172 information bulletins were distributed.

Furthermore, the CSN has a significant list of publications which are available, free of charge, to

Comparative breakdown of activities in the Area of Communications (2007-2008)



* Requests received and dealt with.

anyone requesting them. Over the course of the year, 54 new titles were published, both technical and informative, and a further 12 were repeated as re-editions. A total 79,747 copies were distributed, including the publication of the Annual Activity Report, a publication which is distributed to institutions, organisations and companies relating to the CSN's activities.

Worthy of special mention is the drawing up of a teaching guide for the training of primary education teachers, within the framework of the agreement which the CSN has signed with the Ministry of Education. The guide is distributed to primary schools across the country.

In 2008, a special effort was made to translate documents relating to the IRRS Mission and to publish a new quarterly publication called Alfa, a journal on nuclear safety and radiation protection.

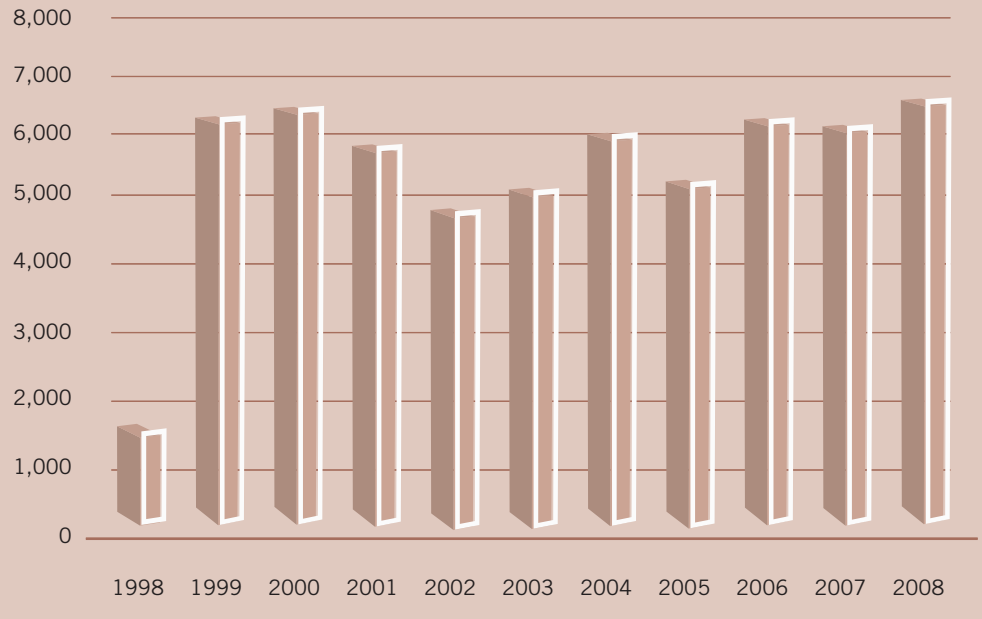
At its headquarters, the Council has an interactive Information Centre, where, through guided tours, visitors can learn about radiations, their uses and risks and the work of the CSN. During 2008, four of the modules were updated and 6,740 visitors were received, the majority of whom were school children accompanied by their teachers. Following the visit, informative material is provided to refresh and expand the information received, and during the year, 23,667 copies of such publications were issued. Furthermore,

each year open days are held, organised by the Autonomous Community of Madrid.

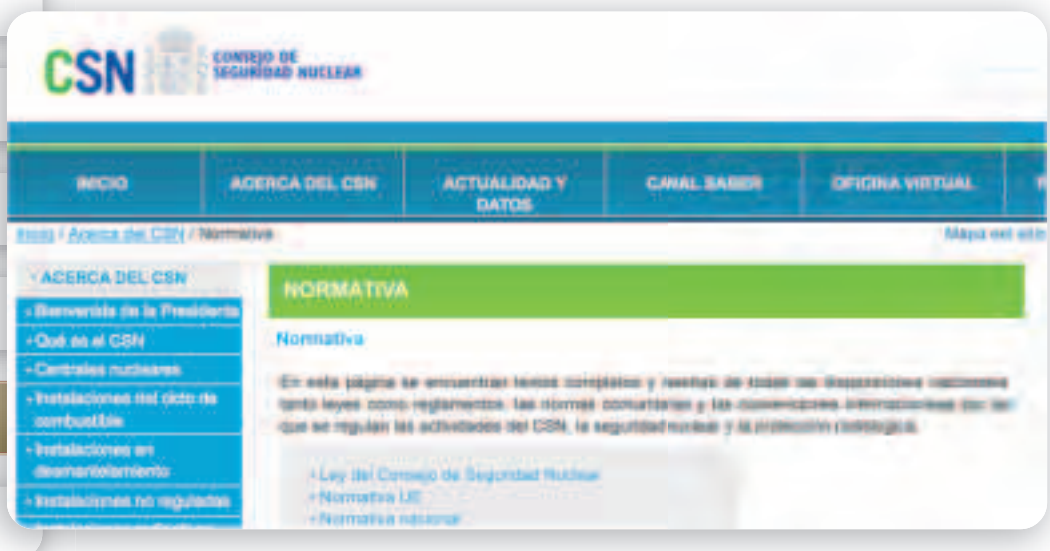
Finally, mention should be made among the informative activities organised, of the CSN's participation in congresses and exhibitions, as well as conferences which are open to the public at the Council's headquarters. In 2008, the CSN took part in the 9th Madrid is Science Fair, the 5th Session on Quality in the Control of Environmental Radioactivity, Fisalud 2008 and CONAMA-9. Throughout the year, the CSN organises conferences given by renowned experts in the academic world, and during 2008 two conferences were held, one on nuclear reactors in the 21st century and another on molecular biology and biomedicine, given by José María Martínez-Val and Margarita Salas, respectively.

Conference by the biochemist Margarita Salas.

Evolution of number of visits to the Information Centre



Regulation



CHAPTER 9

A key component of the Council's regulatory role is the establishment of a framework of technical standards which, whilst defining future standards for the relevant safety and radiation protection processes, offers the licensees of regulated activities guarantees and security in compliance with their obligations.

The amendment of the Law Creating CSN has strengthened the organisation's regulatory and legislative capacity, establishing, furthermore, its ability to propose any required regulations to the Government regarding

CSN instructions and safety guides.

its duties. With regard to the CSN's instructions, the law gives them regulatory standing which are binding once published in the Official State Gazette. This legal status ensures that the parties involved and the public participate in the instruction approval process and that these instructions are communicated to Congress prior to their approval by the Council.

Furthermore, the law also defines the other regulatory instruments available to the CSN: the safety guides contain methods recommended by the CSN, in terms of nuclear safety and radiation protection, their aim being to guide and assist users in the application of Spanish nuclear regulations; circulars, which are informative technical documents concerning facts or circumstances relating to nuclear safety or radiation protection; and complementary technical instructions, which are unique requirements aimed at ensuring that safety conditions and requirements are met by a given licensee.

During 2008, four new CSN safety instructions were published, as well as two safety guides. Furthermore, several provisions affecting the CSN's regulatory framework were approved and published, including Legislative Royal Decree 1/2008, approving the amended text of the Environmental Impact Assessment Act, and Legislative Royal Decree 35/2008 concerning Nuclear and Radioactive Facilities.

Safety instructions

Instruction IS-01, regulating the radiation identity card
Instruction IS-02, on refuelling activities at nuclear power plants
Instruction IS-03, on experts in protection against ionising radiations
Instruction IS-04, on documentation of nuclear power plants in the dismantling phase
Instruction IS-05, on exemption values for nuclides
Instruction IS-06, on training programmes for off-site workers
Instruction IS-07, on areas of application for radioactive facility personnel licences
Instruction IS-08, on criteria applied by the CSN to require guidance on radiation protection
Instruction IS-09, on physical protection criteria
Instruction IS-10, on criteria for the notification of events at nuclear power plants
Instruction IS-11, on nuclear power plant operating personnel licences
Instruction IS-12, on qualification and training requirements for non-licensed workers, on the payroll or external, at nuclear power plants
Instruction IS-13, on radiological criteria for the release of nuclear facility sites
Instruction IS-14, on CSN Resident Inspectors at nuclear power plants
Instruction IS-15, on monitoring of the effectiveness of maintenance at nuclear power plants
Instruction IS-16, on storage periods for documents and records at radioactive facilities)
Instruction IS-17, on the homologation of training courses and accreditations of personnel managing or operating X-ray equipment for medical diagnosis)
Instruction IS-18, on criteria for the notification of radiation events and incidents at radioactive facilities
Instruction IS-19, on the requirements of the management system at nuclear facilities

Additionally, the CSN has taken part in several regulatory projects, including the modification of the Regulation on the protection of health against ionising radiations, the Royal Decree on the use and installation of X-ray equipment and the Royal Decree on the physical protection of nuclear materials. It has also collaborated in the Royal Decree project for the development of article 37 of the Nuclear Energy Act and the Royal Decree for the transfer of Directive 2006/117/Euroatom relating to the control of movements of radioactive waste and spent nuclear fuel.

With regard to regulatory developments at international level, the CSN has collaborated in the drawing up of IAEA guides, as well as in their translation into Spanish.

Finally, the Council's plenary meeting approved a proposal for a new Atatute, intended to replace the one currently in force, which dates from 1982, adapting to the regulatory changes which have occurred since then. It considers a new organic and administrative structure meeting the current needs of the organisation. The proposal has been submitted to the Government for processing, via the Ministry of Industry, Tourism and Trade.


SENADO

The IRRS Mission and management of the organisation

CHAPTER 10

The management and quality system used by the CSN involves applying an on-going improvement model, the objectives of which, in the medium term, are set by the five-year Strategic Plan, whose effective application is included in the annual work plans. In 2008, the activities resulting from this model have been integrated in the IRRS (International Regulatory Review Service) Mission scheduled by the IAEA for the examination of the Spanish regulatory system.

The mission, made up of an international team of experts appointed by the IAEA and led by Ulrich Schmocker, president of the Swiss regulatory

Members of the IRRS Mission to Spain with technicians and representatives of the CSN on completion of the visit.

organisation, has studied in detail the regulatory work of the CSN. The IRRS Mission, initiated at the Council's request, aimed to analyse the structure and performance of the Spanish regulatory organisation in order to assess its strengths and weaknesses and suggest improvements. The review was carried out based on the IAEA standards and current conventions.

The Mission's results were given in the IAEA's *IRRS to Spain Report,* a document disclosed and published by the CSN on presenting the mission's results in Seville at the start of November. In brief, the report identified 19 good practices (above normal and international standards), 27 suggestions and five recommendations to further the improvement of the Spanish regulatory system.

With regard to the Council's strengths, the experts valued its modernisation process for the nuclear regulatory model, recently strengthened by the implementation of the Integrated Plant Supervision System (SISC), and the process of making it available to the public in a clear and understandable manner through the website. Also highlighted was the effectiveness and transparency of the inspection programmes and the existence of forums for dialogue with those interested in radiation protection, amongst other things.

With regard to the mission's recommendations, they highlighted the need to implement a systematic collection and assessment process for information resulting from the control and inspection of nuclear, radioactive and X-ray facilities, as well as to provide the licensees of the authorisations with the results on a regular basis. Another noteworthy suggestion was collaboration between the CSN and the competent

authorities in developing and reporting on the planning for the final disposal of spent fuel and high activity waste.

The actions required to implement the recommendations and suggestions of the IRRS Mission have been incorporated into the CSN's Action Plan and are subject to regular monitoring by the Organisation's Management System Committee. Furthermore, the CSN will inform the aforementioned committee of its action plan and the status of implementation of the improvements deriving from the IRRS Mission. Furthermore, in 2011 the IAEA will assess the implementation of the aforementioned recommendations and suggestions.

Other improvements

Aside from the IRRS, another notable improvement implemented in 2008 was the creation of a basic auditing plan. This means that all of the organisation's processes are subject to an internal audit, based on their relevance, every three or four years. In this respect, the internal process has been updated to adapt to the ISO 19011:2002 standard and an auditor training programme has been set up.

Furthermore, for processes involving function assignment agreements, the audits will include the activities of the respective autonomous communities.

Among the new developments incorporated in the management of the organisation is the implementation of a unique authentication system for digital certificates, the installation of virtual private network access to the CSN for communities with function assignment agreements and for CSN resident inspectors and efforts for the development of the new website.

Strategic Plan and Annual Work Plan

The planning model used at the CSN contemplates the integration of the Annual Work Plan (PAT) in the Strategic Plan. This integration is accomplished by means of the directives and objectives set by the Council each year. As a monitoring mechanism for the Annual Work Plan, there is a control panel which collects all the numerical values from the monitoring indicators established for the most significant PAT activities, these values being compared with the previously established objectives.

During 2008, 30,085 hours were dedicated to planning and management, which is around 7% of the total number of hours worked by CSN staff.

On completion of the IRRS Mission, the process of updating the CSN Action Plan began, including the actions required to implement the mission's recommendations and suggestions. The aforementioned actions are subject to regular tracking by the Organisation's Management System Committee and will be included in future PAT's.

Human and financial resources

CHAPTER 11

Human resources

As of 31st December 2008, the number of CSN staff members stood at 468 people, 3% more than the previous year. It is important to highlight the increase in the number of women working for the CSN, who now amount to around 51% of the total, and the fact that 65% of the CSN staff have higher level qualifications.

Evolution of CSN budgetary management during the period 2004-2008 (Euros)

Year	Final budget	Implementation of income budget	Implementation of expenditure budget
2004	48,267,080	32,433,570.56	37,976,079.68
2005	43,598,350	36,918,417.09	40,216,486.46
2006	41,885,250	41,599,341.02	37,547,887.99
2007	43,823,950	43,531,433.76	39,898,931.89
2008	45,243,730	45,688,314.26	41,210,158.31

During the year, there was a selection process to fill 20 places using an open access system for positions within the Nuclear Safety and Radiation protection Corps. Five candidates who passed the tests were appointed as permanent civil servants. In 2008, the professional experience recognition model was applied for the third time, affecting 16 employees in total.

With the aim of permanently improving employee abilities, the CSN has a Training Plan, which in 2008 was based on six broad areas: nuclear safety, radiation protection, development of management, organisation and communication skills, regulation, administration and management, information and quality systems and languages. The total number of hours dedicated to staff training was 46,331, 18% more than in 2007, at a cost of 682,448 euros, which is an average cost per person of 1,150 euros.

During 2008, a management model was designed for each area of competence and applied to improve training through the identification of the individual needs of the CSN staff members, and the presence of the CSN personnel at national and international events linked to their functional and skills areas continued to be promoted.

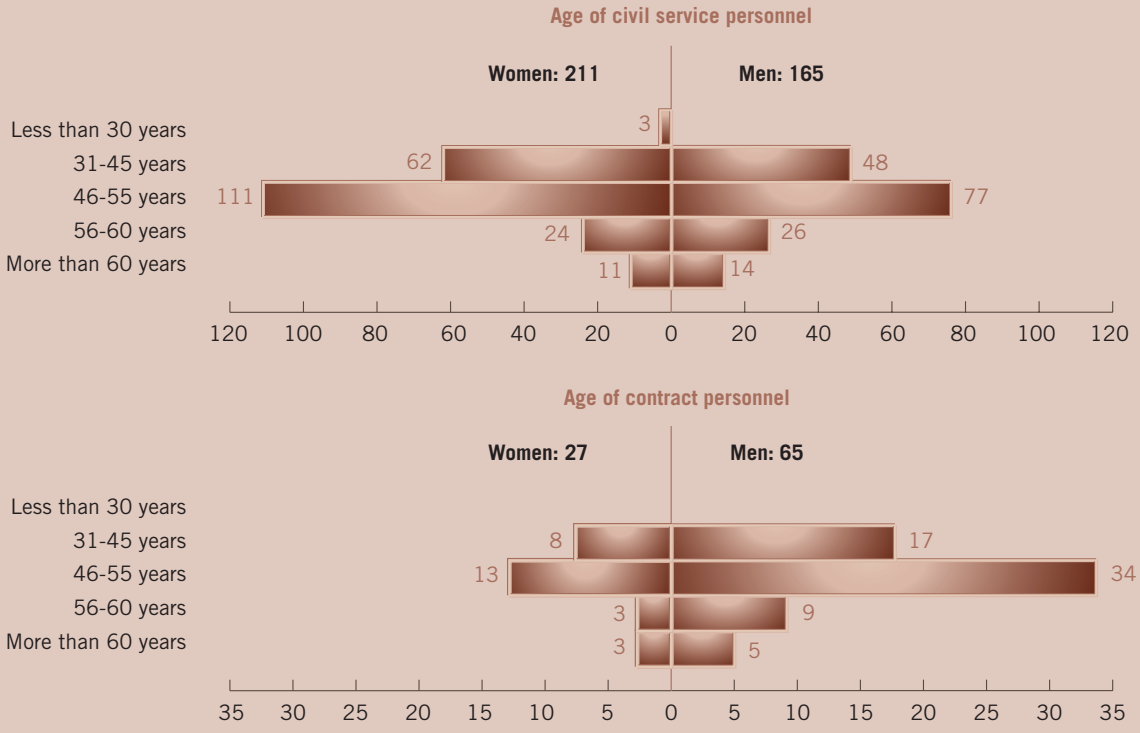
Financial resources

The CSN has its own financial resources, arising from the public fees and prices obtained for the services rendered. Furthermore, the organisation performs other functions related to public and environmental radiation protection which do not involve fees and which are, therefore, financed via the General State Budget.

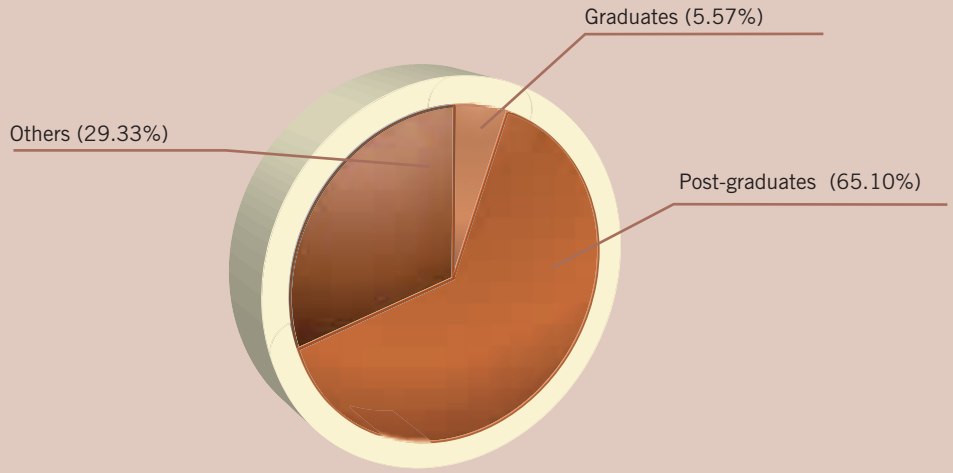
The CSN's budget for 2008 was 45.2 million euros, an increase of 3.24% over the previous year, without any change to the initial budget. The recognised revenues corresponding to fees, public prices and other income stood at 39.2 million euros, with an implementation rate of 99.77%, and those corresponding to current transfers amounted to 5.2 million euros, with an

implementation rate of 99.24%. Expenditure amounted to 41,210,158.31 euros, with staff representing the most significant expense, including wages, social security and welfare costs, representing 56.43% of the total. Income for the year came to a total of 2.6 million euros.

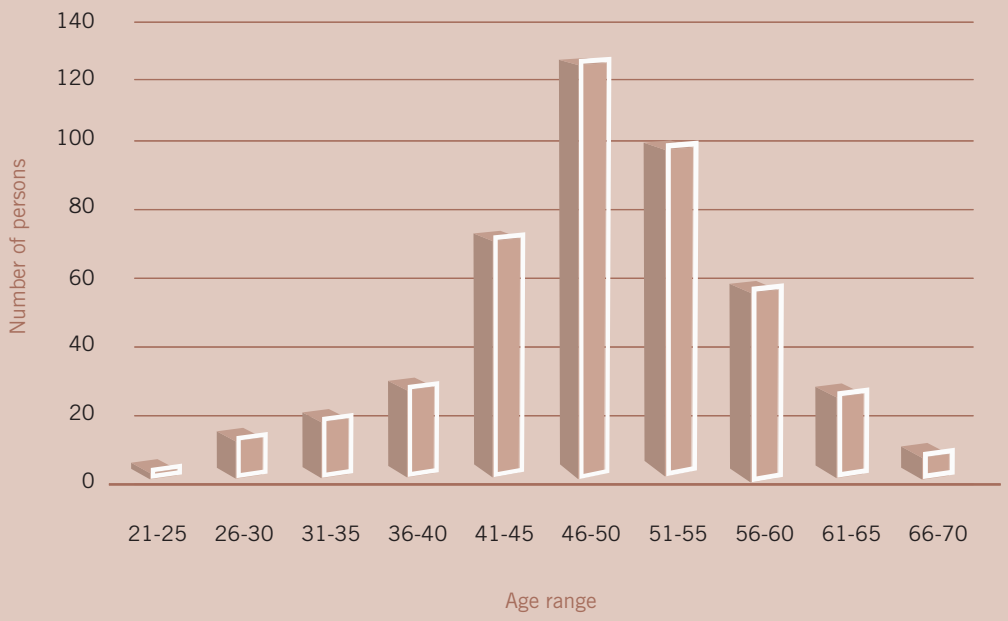
Distribution of workforce by gender



Qualification of CSN personnel



Distribution of CSN personnel by age



CSN personnel in the assembly hall.

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