Spanish Nuclear Safety Council report to the Parliament

Year 2008 Summary

CSN

CSN CONSEJO DE SEGURIDAD NUCLEAR

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Summary

Introducción

The Nuclear Safety Council (CSN) hereby submits its obligatory Annual Report on its activities to the Congress and Senate and to the Parliaments of those Autonomous Communities whose territories house nuclear facilities.

The present report refers to activities carried out in 2008, in compliance with the functions assigned by Law, its objective being to inform the National Parliament, the Parliaments of the Autonomous Communities and, by extension, the members of the general public of the supervision and licensing activities carried out in relation to installations and activities involving ionising radiations, as well as of any other activity relating to nuclear safety and radiological protection and, therefore, to the CSN.

The legal framework applicable to the CSN's activities is determined by Law 15/1980, modified by Law 33/2007. In accordance with the first final provision of this latter Law, in 2008 the CSN approved a Statute of CSN proposal that was submitted to the Government for the corresponding regulatory proceedings via the Ministry of Industry, Tourism and Trade.

Since 2006 the CSN has been using the so-called Integrated Plant Supervision System (SISC) as its basic tool for assessment of the operation of the nuclear power plants from the point of view of safety. The results provided by this tool in 2008 have underlined the acceptable performance of all the plants, although overall in 50% of cases they have required the special regulatory intervention of the CSN, within the framework of the actions foreseen by the system itself.

The events reported by the operating nuclear power plants – 71 in 2008 – do not in themselves constitute indicators of safety and for the most part – 94% in 2008 – refer to *non-safety significant operational deviations*, as defined on the IAEA's International Nuclear Events Scale (INES). In 2008 only three events were classified as level 1 *anomalies* on this scale, with one being classified as an *incident*, or level 2 event, this referring to the release of radioactive particles that occurred at the Ascó I plant, reported to the CSN in early April 2008, the above constituting normal performance despite the specific nature of this last event.

The Ascó I event was undoubtedly one of the most outstanding points of attention during the year, both for the CSN itself and as a result of its impact in the media. In the wake of the immediate response actions undertaken, and following analysis of the available information, the CSN considered this event to have been significant from the standpoint of radiological protection, although it implied no damage to persons or the environment. Following analysis of the performance of the licensee, and in view of the deviations identified with respect to the standards in force, the CSN proposed to the Ministry of Industry, Tourism and Trade that sanctions proceedings be initiated

with respect to 6 infringements and approved the design of the Ascó-Vandellós Nuclear Association Action Plan (Procura Plan) in order to avoid the repetition of the event and correct the deficiencies identified in the organisation and operation of the licensee.

Although the Spanish nuclear fleet has operated correctly throughout 2008, the CSN has underlined the need for greater attention to be given to maintenance policies and investments in safety. For this reason, and as part of a general reflection on the safety of the nuclear power plants, the CSN required the electricity utilities to submit action, priorities and investment plans. These have been examined during the first quarter of 2009 and will be duly reported on in the next annual report.

Also noteworthy in 2008 in relation to the regulation of nuclear power plants has been the evaluation of the requests for renewal of the operating permit for the Santa María de Garoña and Almaraz plants and the requirement for the implementation of a primary circuit bleed and feed system at the Trillo plant, with a view to preventing severe accidents, and of a special radiological surveillance programme at the nuclear power plant sites.

The year 2008 has seen significant progress as regards the preparations for the dismantling of the José Cabrera nuclear power plant, the CSN having issued a favourable report regarding the start-up of the design modification relating to the plant's individual temporary storage facility. This has allowed removal of the irradiated fuel from the pool to begin in early 2009 and is expected to lead to transfer of the ownership of the facility and granting of the plant dismantling authorisation by midyear.

Radioactive waste management has also seen relevant progress in 2008, in particular through the favourable report issued by the CSN for the design modification relating to the very low level waste disposal installation at the El Cabril facility, a modification that, in accordance with the Sixth General Radioactive Waste Plan, will make it possible to address the need to manage large volumes of very low level radioactive wastes arising from the dismantling of facilities.

The increasing complexity of the CSN's activities has been highlighted by the need to license radioactive facilities that are every day more technologically innovative and advanced, such as for example the Alba Synchrotron, managed by the Consorci per a la Construcció, Equipament i Explotació del Laboratori de Llum de Sincrotró (CELLS). This installation will allow an in-depth understanding of matter to be acquired and is expected to yield important applications in the field of research, in industry and among hi-tech companies.

In the area of licensing, the CSN has issued a total 397 reports in 2008, 29 for plant permits, 9 for nuclear fuel cycle and disposal facilities and research centres and

359 referring to radioactive installations, and has awarded 3,581 new licences for nuclear and radioactive facility operating personnel.

As regards its inspectorate function, the CSN has carried out a total 1,843 inspections, 178 at nuclear power plants, 40 at nuclear fuel cycle facilities, waste disposal facilities and research centres, 32 at installations in the dismantling and decommissioning phase and 1,593 at radioactive installations in industry, research and medicine.

In relation to the issuing of standards, this year the CSN has approved 4 new safety instructions and 2 safety guides, in addition to driving various regulatory modifications, such as the proposal for the modification of the Regulation on Health Protection against Ionising Radiations in relation to natural radiation.

In 2008, 99,747 exposed workers have been controlled, with an average individual dose of 0.71 millisieverts. 99.90% of the workers subjected to dosimetry controls received doses lower than 6 mSv/year, and 99.99% received doses lower than 20 mSv/year.

The measures provided by the different radiological surveillance networks show that the radiological quality of the environment, both in the areas surrounding the nuclear facilities and in the national territory overall, has remained normal.

Throughout 2008 the CSN has continued with its policy of transparency, providing public access via the CSN website to the minutes of the Commissions presided over by the Council members, as requested by Parliament, and incorporating the provisions relating to the operating regime of the Advisory Committee for public information and participation in the proposal for the new Charter. Likewise, at the end of 2008 a new CSN website was put in place with the aim of improving the information provided and making it more accessible and participative.

Finally, mention should be made of the IAEA's Integrated Regulatory Review Service (IRRS), which was carried out during 2008. This required special effort by the CSN but concluded successfully with highly favourable results, 19 good practices and 27 suggestions identified. The IAEA made 5 recommendations aimed at improving the operation of the CSN and the Spanish regulatory system in general, which will be addressed prior to the follow-up mission that will take place in 2011.

The results of the mission are included in the IAEA publication *Integrated Regulatory Review Service (IRRS) to Spain*, published by the CSN and available on its website "www.csn.es", and were made public during the presentation held in Seville in November, with the presence of the Director General of the IAEA, Mohamed El-Baradei.

1. The Nuclear Safety Council

Throughout 2008 the Nuclear Safety Council has been constituted by the following members:

- President: Carmen Martínez Ten.
- Vice-President: Luis Gámir Casares.
- Commissioner: Julio Barceló Vernet.
- Commissioner: Francisco Fernández Moreno.
- Commissioner: Antonio Colino Martínez.

The legal framework applicable to the activities of the Council is determined by Law 15/1980, modified by Law 33/2007. In September 2008, the Plenary of the Nuclear Safety Council approved a CSN Estatute proposal pursuant to the first final provision of Law 33/2007 and in compliance with article 1 of Law 15/1980, this being submitted to the Government for regulatory proceedings via the Ministry of Industry, Tourism and Trade.

The project for the new Estatute contemplates a new organisational and administrative structure adapted to the current needs of the Organisation and, at the same time, adapts the text to the legal changes that have occurred since the approval of the Statute of CSN still in force, which dates back to 1982, integrating the reforms that have been introduced over this period in the legal framework governing the activities of the Organisation.

The Nuclear Safety Council held 38 plenary sessions during the year, 37 regular meetings and one extraordinary session to track the situation at Ascó I nuclear power plant, in relation to the detection of radioactive particles reported by the licensee on April 4th 2008.

As the Council's management body, the Board of Commissioner adopted 413 Agreements, 32 of which were orders to the different organisational units, the General Secretary or the members of the Council themselves, with 21 being resolved during the year. In addition, 26 orders corresponding to previous years were closed.

Annex I includes the main Agreements adopted by the Board of Commissioner of the Nuclear Safety Council during 2008. The Council's decisions during this period were characterised by consensus among the members and all the agreements were adopted unanimously and without the need for an individual vote, except for issuing two particular votes in relation to the approval of the Estatute proposal.

The Council was informed of the adoption in 2008 of a total 471 additional decisions, in keeping with the delegations in force in other CSN bodies.

Likewise, in 2008 the Council has agreed on and established the delegation in the Presidency of the express acceptance of the changes and modifications to radioactive facilities foreseen in articles 40.1 and 40.2 of Royal Decree 1836/1999 (Regulation on Nuclear and Radioactive Facilities modified by Royal Decree 35/2008, of January 18th), and the issuing of notifications for the start-up of new radioactive facilities or the modifications to be made to previously authorised facilities pursuant to articles 39.3 and 40.1 of Royal Decree 1836/1999, of December 3rd, approving the Regulation on Nuclear and Radioactive Facilities, modified by Royal Decree 35/2008, of January 18th, the latter in the Technical Director for Radiological Protection.

Throughout 2008 the CSN has continued to drive and develop its policy of increased transparency in the operation and activities of the Organisation, providing public access to the minutes of the Commissions presided over by the members of

the Board of Commissioners, in keeping with the requirements of Resolution number 19 of the Congressional Commission for Industry, Tourism and Trade, in relation to the CSN's Annual Report on the activities performed in 2006. The minutes of the Commissions are also available on the CSN website, providing information on the progress of the tasks entrusted by the Council to each of the Commissions.

Also within the area of transparency, the proposal for the new Estatute develops the requirements of Law 33/2007, in particular the provisions relating to the operation of the Advisory Committee for public information and participation, the function of which will be to issue recommendations to guarantee and improve transparency and propose measures promoting access to information and public participation in matters for which the Nuclear Safety Council is responsible.

The Council Commissions have continued to drive the activities commissioned to the Organisation in the fields of strategic planning, standards, external relations, human and budgeting resources and training and R&D, under the leadership of the different members of the Board of Commissioners. The following are among the more significant activities analysed by the Council Commissions:

- Project for reform of the Nuclear Safety Council Estatute.
- Proposal for modification of Title VII of the Regulation on Health Protection against Ionising Radiations, in relation to natural radiation sources.
- Presentation of the results of the IRRS mission and of the International Conference on the control of sources in scrap.
- Project for the new CSN website.
- Project on the implementation of Law 11/2007 on electronic access for the citizens to public services.
- Reform of the CSN headquarters building.
- R&D Plan for 2008-2011 and basis for subsidies for R&D projects in 2009.

The members of the Board of Commissioners participate in activities to represent the Organisation within the framework of the liaison committees with the licensees, international delegations and the emergencies division and head the CSN's activities in matters of a special nature or importance. The following are among the most significant activities carried out in these areas during the year:

- Hosting of the IRRS mission, the IAEA international seminar on the dissemination of IRRS missions and the presentation of the results of the IRRS mission to Spain.
- Presentation of the Spanish report to the 4th review meeting of the Convention on Nuclear Safety.
- Meetings of the European Union High Level Group for nuclear safety and radioactive waste with a view to harmonising safety criteria at European level, these having provided impulse for the European Union's Directive on Nuclear Safety.
- CSN-Unesa liaison committee: meeting for the joint review of relevant incidents, operational indicators and their trends and special on-going action plans. The licensees undertook to carry out specific analyses at each plant to establish complementary improvement programmes reinforcing resources and investments.

- The tasks of the working group for the analysis of the radioactive particles emission event that occurred at Ascó I nuclear power plant.

- The tasks of the working group on the radiological protection of patients, set up with a view to defining the scope and specifying the activities of this new CSN function.

- The working group that has drawn up the third national report for the Convention on the Safety of Spent Fuel Management and Safety of Radioactive Waste Management.

As regards information for the Parliament, the CSN has punctually lived up to its legal obligations.

The Annual Report on activities carried out during 2007 was submitted to the Congress and the Senate in July 2008. The Council made the following appearances before the Parliament during the year:

- Appearance of the President before Congress in June in order to report on the radioactive particle emission event at Ascó I nuclear power plant.

- Appearance of the President before the Senate in October in order to report on activities carried out during 2007.

- Appearance of the President before Congress in November in order to report on activities performed during 2007 and to provide other information requested specifically in relation to the Ascó, Vandellós II and Almaraz plants. In the context of activities performed during 2007, there was also a previous appearance by the technical directors of nuclear safety and radiological protection.

The CSN has responded to 30 written questions from the Congress and the Senate and to 50 Resolutions from the Congressional Commission for Industry, Tourism and Trade.

2. Supervision and control of installations and activities

2.1. Nuclear power plants

2.1.1. Operation

The six nuclear power plants shown in table 1 (eight reactors) were in operation during 2008.

The overall evaluation of the operation of the nuclear power plants is carried out fundamentally on the basis of the results of the Integrated Plant Supervision System (SISC), the events reported, especially those classified on the INES scale at a level higher than zero, the radiological impact of the dosimetry of the exposed workers, the relevant modifications proposed, the warnings and sanctions issued and operating events.

Integrated Plant Supervision System (SISC)

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

The CSN website includes a specific link to the SISC: www.csn.es/sisc/index.do, where the results of the system and the operational information supporting them are included, updated quarterly for all the plants, along with descriptive documentation and the corresponding procedures.

Table 1. General information on the nuclear power plants and their operation in 2008

	Almaraz I	Almaraz II	Ascó I	Ascó II	Vandellós II	Trillo	Garoña	Cofrentes
Type	PWR	PWR	PWR	PWR	PWR	PWR	BWR	BWR
Thermal power (MW)	2,729	2,729	2,952.3	2,952.3	2,940.6	3,010	1,381	3,237
Electrical power (MW)	980	984	1,032.5	1,026.25	1,087.1	1,066	466	1,096
Authorisation for start-up	13-10-80	15-06-83	22-07-82	22-04-85	17-08-87	04-12-87	30-10-70	23-07-84
Authorisation in force	08-06-00	08-06-00	02-10-01	02-10-01	26-07-00	16-11-04	05-07-99	19-03-01
Period of validity (years)	10	10	10	10	10	10	10	10
Refuelling outage	14-04-08 to 28-05-08	N/A	N/A	25-10-08 to 21-12-08	N/A	08-04-08 to 07-05-08	N/A	N/A
Operating factor %	87.94	100	88.43	84.39	79.41	89.02	99.16	87.00
Load factor %	87.09	100	85.77	82.51	75.78	88.34	98.23	85.02
SISC indicators > green	–	–	–	1 white	2 white	3 white	–	2 white
SISC findings > green	–	–	1 yellow 3 white	1 white	2 white	–	–	–
Event levels INES > 0(1)	–	–	1 level 1 1 level 2	1 level 1	–	–	1 level 1	–

(1) Events reported by the nuclear power plants in 2008 and classified by the CSN above level 0 on the INES Scale.

During 2008, eight operating indicators and seven inspection findings of a higher level than *green* were recorded:

a) Indicators:

- One *white* indicator at the Ascó II plant, corresponding to non-scheduled instantaneous scrams per 7,000 hours of reactor criticality, due to four shutdowns in 2007.

- Three *white* indicators at the Trillo plant due to a fault affecting the diesel generators. This fault has been on-going since the fourth quarter of 2007 and furthermore another fault occurred in a diesel generator during the first quarter of 2008.

- Two *white* indicators at the Vandellós II plant due to a diesel generator fault.

- Two *white* indicators at the Cofrentes plant relating to eight non-scheduled power changes per 7,000 hours of reactor criticality.

b) Findings:

- One *yellow* finding at the Ascó I plant as a result of the incident involving the release of radioactive particles from the fuel building, reported to the CSN in April 2008.

- One *white* finding at the Ascó I plant in the area of occupational radiological protection, due to insufficiencies in preventing individual contamination in relation to the aforementioned particle release event.

- One *white* finding at the Ascó I plant in the area of initiating events, in relation to the risk of the containment building post-tensing system surveillance platforms in the event of an earthquake, with the possibility of their damaging safety-related equipment.

- One *white* finding at the Ascó I plant in the area of mitigation systems, in relation to equipment failures within the scope of the maintenance rule.

- One *white* finding at the Ascó II plant in the area of mitigation systems, in relation to equipment failures within the scope of the maintenance rule.

- One *white* finding at the Vandellós II plant in relation to deficiencies in the assembly, supervision and start-up testing of the essential chilled water system, modified during the last refuelling outage.

- One *white* finding at the Vandellós II plant in relation to the incorrect performance of a design modification affecting the sealing of penetrations and the leaktightness of doors in response to internal flooding.

The results set out above make up the action matrix shown in table 2 for all the plants and the four quarters of 2008.

Reportable events

In 2008 the nuclear power plant licensees reported a total 71 events, 67 of which were classified at level 0, three at level 1 and one at level 2 on the International Nuclear Events Scale (INES). Compared to 2007, the number of reports decreased by 23, this due to a significant drop in the number of non-scheduled safety system actuations.

The CSN's Incident Review Panel (IRP) analysed the events reported, classifying 18 of them as *significant*, six as *generic* and four as both significant and generic. The events classified above 0 on the INES scale were as follows:

Table 2. Summary of the action matrix during the four quarters of 2008

	I quarter	II quarter	III quarter	IV quarter
Almaraz I				
Almaraz II				
Ascó I		One degraded pillar	One degraded pillar	One degraded pillar
Ascó II	Regulatory response	Regulatory response	Regulatory response	Regulatory response
Cofrentes			Regulatory response	Regulatory response
Garoña				
Trillo	Regulatory response	Regulatory response	Regulatory response	
Vandellós II	One degraded pillar	One degraded pillar	One degraded pillar	One degraded pillar

- Level 2 event on the INES scale at the Ascó I nuclear power plant, reported on April 4th 2008 and consisting of the release of radioactive particles with activated corrosion product isotopes. This occurred as a result of the contamination of the fuel building ventilation system at the end of the nineteenth refuelling outage in Group I of the plant. Both the contamination of the ventilation system and the subsequent release of particles were related to a combination of incorrect practices and non-compliance with the operating standards.

  The detection of the release and its subsequent notification took place over four months after the occurrence of the event, since it became evident not because of the available automatic radiological control systems but through a site radiological surveillance walkthrough. This was due mainly to the fact that these systems are designed to detect homogeneous radioactive emissions and not discrete particles such as those involved in the event.

  More than two weeks elapsed between the detection of the first active particles and the reporting of the event, which was finally forced by the intervention of the CSN.

  The CSN's activities, and especially the radiological measurement campaigns carried out, make it possible to rule out any type of radiological impact on persons, and point to only a very limited dispersion of activity in the environment. Nevertheless, the cases of non-compliance by the licensee, qualified by the potential risk of the incident, have led to a proposal for the initiation of sanctions proceedings against the Ascó I nuclear power plant.

- Level I event at Ascó I nuclear power plant, reported on April 21st 2008 and consisting of the exit from the plant site of a truck with scrap that had incorporated radioactive particles arising from the aforementioned event. The contamination was detected by the gate monitor

of a metallic materials handling facility in the nearby town of Reus. The event gave rise to the entry into service of a radiological detection gate monitor at the plant site.

From the radiological point of view, the event had no impact on either persons or the environment, including the resources used for transport.

- Level I event at Santa María de Garoña nuclear power plant, reported on August 18th 2008. This was due to the detection of a capacity fault in the feed batteries for essential busses A and B. In a retrospective analysis of the fault it was not possible to rule out the hypothesis that the batteries may have simultaneously had a lower capacity than that required, thus infringing the operating specifications.

  The licensee changed the batteries and checked all those of the same type in service at the plant, also undertaking other corrective actions such as an increase in the frequency established in the operating specifications for battery capacity testing and the adoption of measures to prevent battery ageing.

- Level 1 event at Ascó II nuclear power plant, reported on December 13th 2008. This consisted of a detection error in determining the makeup flow of the auxiliary feedwater system to steam generator A, which if required would have injected a lower flow than that established. The fault was the result of a calibration error affecting both the meter measuring the injection flow and the flow transmitter governing the system control loop, the readings of which were 10% higher than the actual value.

  The licensee adjusted the flow to the correct value and checked that this error did not affect the similar lines to the other steam generators in both of the plant groups. The licensee also carried out a retrospective technical study, justifying that the flow value had been higher than the minimum required to meet the safety criteria established in the analyses ensuring core cooling.

Sanctions and warnings

The CSN proposed the initiation of two sanctions proceedings to the Ministry of Industry, Tourism and Trade in 2008:

1. To Almaraz nuclear power plant for non-compliance with the provision of the operating Regulation that requires a minimum 100 classroom hours in the on-going training of licensed operators and supervisory personnel, in accordance with CSN Safety Guide 1.1.

2. To Ascó nuclear power plant for the cases of non-compliance detected in the radioactive particle release incident. The proposal for the initiation of sanctions proceedings contemplated the following:

   - One maximum level serious sanction for a radioactive release potentially exceeding the annual dose limit for members of the public associated with operational non-compliance.

   - One intermediate level serious sanction for non-compliance with the radiological zone classification, signposting and enclosure standards and the non-implementation of appropriate personnel external contamination controls.

   - One intermediate level serious sanction and one minimum level slight sanction for delays and deficiencies in transmitting information to the CSN and its resident inspectors.

   - One intermediate level serious sanction for not registering the contamination detected in free access areas in the surveillance records.

- One minimum level slight sanction for the incorrect radiological control of a truck loaded with contaminated scrap at the exit from the plant.

During the year the CSN also decided to issue a warning to the Almaraz nuclear power plant for non-compliance with the Group II operating technical specifications, due to the maximum period for performance of the containment integrated leak test having been exceeded.

2.1.2. Licensing

In 2008 the Nuclear Safety Council issued 29 decisions regarding authorisations and eight favourable reports. The following are among the most important licensing issues:

- Almaraz and Ascó plants: application of Regulatory Guide 1.195 for calculation of radiological consequences in the event of an accident and habitability of the control room.

- Ascó II plant: use of alternatives to ASME Code XI and N-504-2 and N-638-1 code cases for the design and performance of a weld overlay on the pressuriser nozzles in this group.

- Ascó and Vandellós II plants: revision of their respective operating Regulations as a result of the important reorganisation of the Asociación Nuclear Ascó-Vandellós (ANAV).

- Cofrentes plant: temporary change in the location of the security alarms centre, in relation to the implementation of CSN instruction IS-09.

- Almaraz plant: approval of a complementary technical instruction relating to conditioned application standards.

- Cofrentes plant: design modification for increased maximum burnup of the SVEA-96 OPTIMA 2 fuel pellet as a result of extension of the cycle from 18 to 24 months.

- Cofrentes plant: design modification for replacement of the racks in the irradiated fuel storage pool.

In addition, reports have been issued in relation to revisions of the official operating documents of various nuclear power plants, along with the site emergency plans, operating regulations, operating technical specifications and safety studies.

Furthermore, the CSN issued a complementary technical instruction affecting the Trillo nuclear power plant, requiring the submittal within nine months of an implementation plan for the primary bleed and feed design modification.

2.1.3. Supervision and control

The CSN carries out the supervision and control of the nuclear power plants through the exercising of its inspectorate function and by supervising the development of the different plant safety enhancement programmes.

2.1.3.1. Inspection

The number of inspections carried out at the six plants in operation (eight groups) in 2008 amounted to 178. Of these, 104 corresponded to the Basic Inspection Programme (BIP), contemplated in the SISC, which in 2008 included 80 inspections performed by CSN specialists in different disciplines plus those carried out by the resident inspectors, these being reflected in the 24 quarterly inspection reports. This has meant the performance of practically all the inspections scheduled in the BIP for 2008.

The remaining 74 inspections include the supplementary inspection performed as a result of indicators or findings of a category higher than green, the inspections carried out in response to operating incidents, the inspections performed on generic issues due to the new standards and in-house and industry operating experience and the inspections relating to licensing issues. Particularly significant have been the efforts made in investigating and determining the consequences of the active particle emission incident at the Ascó plant, with 11 inspections.

2.1.3.2. Safety improvement programmes

The most important safety improvement programmes in force during 2008 were as follows:

Periodic safety review programmes

The evaluation of the periodic safety reviews submitted by the Santa María de Garoña and Almaraz plants continued in 2008, along with evaluation of the documentation justifying compliance with the CSN complementary technical instruction on *conditioned application standards*, this being in relation to the renewal of their operating permits, which expire in July 2009 and June 2010, respectively.

Generic issues

Generic issues are understood to be any safety problem identified at any national or overseas nuclear power plant that might affect other plants. The CSN tracks such issues and promotes their analysis and the adoption at the Spanish plants of the corrective actions arising from such analysis. The most relevant generic issues in 2008 have been as follows:

- *Applicability of NRC Generic Letter GL-2008-01*. In this letter the US regulatory body requires the performance of analyses to prevent the accumulation of gases in the piping of the emergency core cooling, residual heat removal and containment spray systems. The CSN issued a technical instruction to all the Spanish plants requesting a similar analysis.

- *Analysis of the particle emission incident at Ascó I nuclear power plant, ISN-AS1-127:* the CSN required all the Spanish nuclear power plants to analyse the applicability of the event to their facility, with special emphasis on the venting systems, non-filtered extraction paths and possible hot particle generation mechanisms. The analyses have been received and are currently in the evaluation phase.

As a result of this event, and of the notification of locations with radioactive contamination inside the double perimeter fence of other installations, the CSN required all the nuclear power plants and the Juzbado fuel manufacturing facility to carry out a special radiological surveillance programme of exterior areas on their sites. All the licensees have submitted their respective plans and performance is currently pending the incorporation of the improvements required by the CSN.

Also as a result of this event and of the exit from the Ascó plant of contaminated material, as referred to in section 2.5, all the nuclear facilities were required to put into service a radiological detection gate monitor to control the exit of any radioactive material from the site.

Safety management improvement action plan (SMIAP) at Vandellós II

With the implementation of all the actions contemplated in the four management programmes of the SMIAP: management and leadership, organisation, management systems and communication, completed in 2007, Vandellós II has focussed throughout 2008 on verifying the efficiency of the aforementioned actions, publishing and implementing a guideline. The degree of progress made in this process of

verification allows us to estimate that it will be concluded during the first four months of 2009.

With a view to supervising this verification process, the CSN carried out two inspections and held two technical meetings with the licensee.

As regards design modifications, only the implementation and operability of the new engineered safeguards cooling water system remains pending. Throughout 2008, the licensee has progressed in the construction and assembly of this system, its entry into service being foreseen following the completion of the corresponding refuelling outage in 2009.

In tracking these activities, the CSN carried out fifteen inspections, the scope of which covered from aspects of the licensing of the new system to its construction and assembly.

Ascó Procura Plan

As a result of the particle emission event at Ascó, the CSN sent a technical instruction to the licensee of the plant requiring the performance of a root cause analysis and the definition of corrective actions.

The Ascó plant submitted an action proposal aimed at identifying the factors contributing to the event and at establishing the basis for the development of an improvement plan known as the *Organisation, Cultural and Technical Reinforcement Plan* (Procura), with a timeframe of three years. On June 18th 2008, the CSN issued its favourable report on this proposal.

The Procura Plan was submitted for CSN approval in February 2009. Furthermore, the CSN has established a *Supervision programme* aimed at checking the implementation of the corrective measures of the Plan and verifying their efficiency.

Plant resources reinforcement plans for the period 2009-2013

In view of certain incidents that have occurred at the nuclear power plants in recent years, the CSN-Unesa Liaison Committee agreed to carry out an analysis of each plant by its respective licensee to identify possible areas for improvement and strengthen the dedication of resources in the necessary areas, including maintenance, personnel training, the analysis of operating experience and the renewal of plant equipment and staffing.

The analyses were submitted to the CSN in December 2008 and have been dealt with in meetings with the licensees throughout the first quarter of 2009. These discussions will be held annually with a view to updating the plans and continuously verify safety-related investments and resources.

2.1.4. Conclusions

The evaluation of the results of the SISC, along with the consideration of other plant performance aspects, as set out in this section and in subsequent sections on radiological impact, allow it to be stated that during 2008 the Spanish nuclear power plants operated correctly, within the established safety limits, without the occurrence of situations of undue risk, with the exception of the radioactive particle emission event at Ascó I. In this last case, and although the risk did not lead to any radiological damage, corrective actions and measures were adopted by the CSN and sanctions proceedings were initiated.

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

This section deals with the Juzbado fuel assembly manufacturing facility, the El Cabril waste disposal facility and the Centre for Energy-Related, Environmental and Technological Research

(Ciemat). During 2008, all these facilities operated within the established safety margins, without situations of undue risk.

Licensing

In response to requests from these facilities, the CSN issued nine decisions throughout the year regarding different authorisations. The following were particularly significant in this respect:

- Juzbado fuel assembly manufacturing facility: approval of the revisions of the following official operating documents: Operating Regulation, Site Emergency Plan and Safety Study.
- Juzbado fuel assembly manufacturing facility: granting of an extension for updating of the facility's security system.
- El Cabril waste disposal facility: authorisation of a design modification for the definitive disposal of very low level wastes.
- El Cabril waste disposal facility: approval of revisions of the following official operating documents: Safety Study, Operating Technical Specifications, Site Emergency Plan and Criteria for the Acceptance of Disposal Units.
- Ciemat: approval of revision 1 of the Ciemat Radioactive Waste Management Plan and approval of modifications to the following radioactive facilities at the Centre: IR-02, Sources of verification for instrumentation and control, and IR-08, Radioisotopes Laboratory

Inspection and control

In the development of the respective control programmes, the CSN carried out a total 40 inspections, 17 at the Juzbado fuel assembly manufacturing facility, 11 at the El Cabril disposal centre and 12 at Ciemat.

Reportable events

There were two reportable events at the Juzbado facility:

- Event on May 6th, relating to the emission of aerosols in the PWR sintering area during an incorrectly performed maintenance operation. The corresponding alarms were activated and the area was evacuated. Subsequent checks showed that the exposed workers present had not been contaminated.
- Event on August 18th, relating to a fire in the site security zone located outside the perimeter fence of the facility. The facility was not affected.

Sanctions and warnings

There have been none.

Relevant issues

The approval of a definitive disposal installation for very low level wastes at the El Cabril facility is an issue of great interest. The new "East" platform with its four cells will be used for this purpose, allowing more rational advantage to be taken of the capacity of the centre and saving space on the North and South platforms, which were initially designed to house wastes having a much higher level of activity.

Work continued on the dismantling and rehabilitation of areas and buildings within the framework of the integrated plan for improvement of the Ciemat installations (PIMIC). During 2008 work began on the process of characterising and dismantling the underground tanks in the reactor building and interventions were completed in buildings 13, 18, 53 and 76.

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

The nuclear or radioactive facilities involved in the fuel cycle that have been definitively shut-down or are in the dismantling and decommissioning phases are the Vandellós I nuclear power plant, currently in the safestor phase following completion of the first phase of dismantling, the José Cabrera plant, which is shut-down and awaiting its dismantling permit, the Elefante and Quercus uranium concentrates plants, dismantled and in the compliance phase and in the shutdown situation respectively, the Andújar uranium mill (AUM), dismantled and in the compliance phase, and the Lobo-G plant at La Haba, which is decommissioned and under institutional surveillance. The conservation, characterisation, dismantling and surveillance activities carried out at these installations in 2008, depending on the status of each, have been performed within the established safety limits and without any undue impact for persons and the environment.

Licensing

Throughout 2008 the CSN issued 13 decisions regarding different authorisation.

The following were particularly significant in this respect:

- Vandellós I nuclear power plant: authorisation of new revisions of the following official documents during the safestor phase: Site Emergency Plan, Operating Regulation and Surveillance Plan.

- José Cabrera nuclear power plant: start-up of the design modification for the temporary spent fuel dry storage facility.

- José Cabrera nuclear power plant: approval of revisions of the following official operating documents: Shutdown Safety Study, Shutdown Technical Operating Specifications, Site Emergency Plan and Shutdown Operating Regulation.

- Quercus plant: temporary suspension, for two years, of the dismantling licensing process of the facility.

- Quercus plant: approval of revisions of the following official documents: Operating Regulation, Facility Verification, Operating Specifications and Site Emergency Plan.

Inspection and control

Within the framework of their respective control programmes the CSN performed 32 inspections at the following facilities: three at the Vandellós I nuclear power plant, 14 at the José Cabrera nuclear power plant, eight at the Quercus plant, two at the Elefante plant, three at the Andújar uranium mill (AUM) and two at the Lobo-G plant.

Reportable events

- Event on April 9th at the José Cabrera plant, in relation to the detection of defects in the structural material of the reactor building gantry crane, this affecting safety in the movement of heavy loads over the fuel pool. The event was classified at level 0 on the INES Scale. The equipment was repaired, the affected elements being replaced.

- Event on May 16th at the Quercus plant, in relation to a spurious trip of the fire extinguishing system. The event had no consequences and the anomalies detected in the system were corrected.

Sanctions and warnings

There have been none.

Relevant issues

The environmental radiological surveillance programmes, the radiological protection of the workers, the security programme and, if necessary, the control of effluent releases and waste

management programme are maintained at all the facilities in the definitive shutdown, dismantling and decommissioning phases. In 2008, none of the facilities reported on deviations in the performance of these programmes.

The most significant activities carried out at José Cabrera in 2008 have focussed on the maintenance of safe conditions for the fuel stored in the fuel assembly pool and on the preparation of all the equipment required for the safe transfer of this fuel to the Individual Temporary Storage Facility. It should also be pointed out that on May 5th Enresa submitted the request for authorisation of the plant dismantling and decommissioning plan, which implies transfer of the ownership of the facility.

The authorisation granted to the Quercus plant for a two-year suspension of the already initiated licensing and dismantling process will allow Enusa to consider the restart of production activities depending on the evolution of the Uranium concentrates market. In any case, the corresponding set of conditions guarantees the maintenance of the facility in safe conditions pending a decision on its final destiny.

2.4. Radioactive facilities

The operation of the radioactive facilities for scientific, medical, agricultural, commercial and industrial purposes continued throughout 2008 within the framework of the safety standards established, in compliance with the measures in place for the radiological protection of persons and the environment.

Licensing

The licensing of these facilities is carried out by the CSN in collaboration with the Autonomous Communities with which functions assignment agreements have been signed.

Table 3. Evolution of the number of radioactive facilities

Category	Field of application	2004	2005	2006	2007	2008
1ª	Irradiation	1	1	1	1	1
	Subtotal	**1**	**1**	**1**	**1**	**1**
2ª	Commercialisation	55	49	46	51	53
	Research and teaching	82	84	80	85	89
	Industry	587	600	582	597	604
	Medicine	270	276	287	309	315
	Subtotal	**994**	**1,009**	**995**	**1,042**	**1,061**
3ª	Commercialisation	16	12	13	14	15
	Research and teaching	88	90	89	95	95
	Industry	161	145	152	157	156
	Medicine	70	66	57	52	51
	Subtotal	**335**	**313**	**311**	**318**	**317**
	Medical X-rays	24,069	25,222	25,902	28,438	29,714
	Total	**25,399**	**26,545**	**27,209**	**29,799**	**31,093**

On 2008, 359 decisions were issued in relation to radioactive facilities:

- 56 regarding operating permits.
- 35 regarding the declaration of decommissioning.
- 268 regarding authorisations for different modifications.

Inspection and control

As in the case of licensing, inspection is performed in collaboration with the Autonomous Communities with which functions assignment agreements have been signed. In 2008, 1,593 inspections were carried out at radioactive facilities. The distribution by types was as follows:

- 126 licensing inspections.
- 1,197 control inspections at radioactive facilities.
- 246 control inspections at radiodiagnosis facilities.
- 24 inspections relating to incidents, complaints o irregularities.

In addition to the inspections, the control of the facilities rests on the review of the periodic reports. In 2008 the CSN received 1,090 annual reports from radioactive facilities and around 22,000 from X-ray diagnostic installations, along with 238 quarterly commercialisation reports.

The result of the inspections, along with analysis of the annual reports from the facilities, information on radioactive materials and equipment supplied by the commercialisation installations and the waste management data provided by Enresa, gave rise to the issuing of 224 control letters.

Also significant as regards the control activities is the attention given to complaints, of which 10 were recorded in 2008. In most cases an inspection visit was made and information on the result was provided to those filing the complaint.

Events and incidents

During 2008 there were 12 significant incidents at radioactive facilities, with eight attributable to operating faults, one to equipment failure and three to the removal of radioactive equipment.

Particularly significant was the overexposure of a exposed worker at the Cualicontrol-ACI, S.A.U. facility in Tarragona, who accessed the gammagraphy bunker with the source in exposure. He received an estimated dose of 10 Gray in his right hand, this being far higher than the regulatory limit. He suffered radio-induced lesions in some of his fingers.

The exposed worker was examined at an authorised healthcare centre for persons wounded and contaminated by radioactive isotopes and ionising radiations, the dose received being estimated by biological dosimetry techniques. The haematological and biochemical studies included in subsequent medical supervision have identified the absence of general effects, although the wounded area will continue to be subjected to dermatological controls.

Sanctions and warnings

In 2008, the CSN proposed the initiation two sanctions proceedings to the competent authority, one in relation to the case of overexposure described above. The causes habitually underlying sanctions proposals are the performance of activities requiring authorisation without such authorisation, the operation of facilities by non-licensed personnel and non-compliance with the instructions and requirements imposed.

Likewise, as a result of its facilities evaluation and inspection control activities, the CSN has issued 69 warnings, identifying the deviations identified and requiring their correction.

Relevant issues

The effectiveness of the measures adopted in 2007 to speed up the licensing process, among them the simplification of the authorisation processes included in the modification of the Regulation on Nuclear and Radioactive Facilities, RD 35/2008, of 28/01/2008, became evident throughout 2008, a balance being achieved between authorisation proceedings inputs and outputs and an average period of less than five months being registered for resolution.

Work continued on the drawing up of the national inventory of high level sealed radioactive sources and the CSN collaborated with the Ministry of Industry, Tourism and Trade in the orphan source recovery campaign initially foreseen for 2007 and 2008, which has subsequently been extended to include 2009.

The CSN continues to disseminate knowledge of good practices, operating experience and teachings deriving from incidents by way of sector-specific informative circulars. In 2008, two circulars were sent to industrial gammagraphy facilities on incidents that occurred in this practice, and a third was sent to companies dealing in gammagraphy material in relation to the entry into force of the Complementary Technical Instruction sent to the licensees of the installations in May 2006.

2.5. Transport of nuclear and radioactive materials

In the field of licensing, in 2008 the CSN reported on a total four requests for the validation of approval certificates for waste packages from abroad. Reports were issued also on two security authorisations for the transport of nuclear materials and two resolutions establishing the coverage of nuclear risk in the transport of nuclear substances.

Transport inspections are performed on a wide sample of the transport operations implying the highest risk. Throughout 2008, 60 nuclear and radioactive material transport inspections were performed, 22 by the CSN itself and 38 by the Autonomous Communities with which function assignment agreements had been signed. This control is completed with analysis of the previous notifications and performance reports required by the CSN for the transport of fissile materials, high level radioactive sources and wastes. During 2008, 71 corresponding to shipment of fissile material and 220 radioactive waste transport operations carried out by Enresa were analysed, along with 176 from nuclear facilities and 44 from other installations.

Eight incidents were recorded in 2008 in the transport of radioactive material:

- Three road accidents affecting packages containing radioactive material for medical or research purposes, none of which suffered any appreciable damage. There was no radiological risk.

- One case of theft of an item of radioactive equipment from the vehicle in which it was being transported. The equipment was later found undamaged. There was no radiological risk.

- Three incidents of international importance, the first affecting an item in transit (with overseas origin and destination) and the second a shipment to Spain, both with discrepancies between the actual contents and the labelling. The third corresponded to a transport operation from Spain to an overseas destination in which two items of radioactive equipment had the

radiation shutter in the open position. In all these cases the regulatory authorities of the countries affected were notified for controlling of the event and the determination of responsibilities, and the radiological risk was analysed and found to be non-existent, except in the first case, in which the estimated doses were lower than the annual limit for the public.

- Finally, mention should be made of the irregular transfer of scrap with remains of contamination from the particle emission incident that occurred at Ascó NPP on November 29th 2007. The radiological risk was estimated to be irrelevant, despite which it gave rise to a proposal for a sanction for slight infringement against the licensee of the plant, within the overall sanctions proceedings arising from the aforementioned incident.

2.6. Manufacturing of radioactive equipment and exemptions

During 2008 the CSN issued two decisions regarding authorisations for the manufacturing of radioactive equipment. In addition it reported on 21 proceedings for the type approval of radioactive apparatus, this implying the exemption of 43 equipment models from consideration as radioactive facilities.

2.7. Service entities

This heading encompasses companies and entities subject to nuclear regulation and rendering services to others in the field of radiological protection. It includes radiological protection services (RPS), radiological protection technical units (RPTU), companies selling medical X-ray equipment and providing technical assistance, personal dosimetry services (PDS) and external registered companies.

The following activities were particularly significant in 2008:

- The CSN authorised five new radiological protection services and closed two. It also authorised a new radiological protection technical unit, modified the permit for two that has previously been authorised, closed one and suspended the authorisation of another.

- Inspections were performed at 17 radiological protection services (RPS) and 20 radiological protection technical units (RPTU), in collaboration with the Autonomous Communities with which functions assignment agreements have been signed.

- At present, 71 RPS's and 47 RPTU's are authorised; of the latter, 26 provide services only in the field of radiodiagnosis facilities.

- At the end of 2008 an RPTU Forum was set up between the CSN and the Spanish Radiological Protection Society, in view of the useful results that are being provided for all the stakeholders by the Radiological Protection Forum in the medical field. The first working groups have now begun to operate in areas referring to the medical use of X-rays.

- The CSN reported on the authorisation of 14 new sales and technical assistance companies, the modification of the authorisation for 12 others and the filing of two requests.

- The modification of two external personnel dosimetry services was authorised and, in response to requests from the licensees, one authorisation was turned down and another was suspended for five years. Eleven inspections were carried out at external dosimetry services and one at the Tecnatom internal dosimetry service as a result of the measurement of the internal whole body radioactivity of external

personnel arising from the incident that occurred at Ascó on 4th April of 2008. Furthermore, the technical bases were established for the performance of the 2nd Inter-Comparison Campaign of Internal Personnel Dosimetry Services in the nuclear sector.

- As of December 31st 2008, a total 1,110 companies were included on the register of external companies, the vast majority involved in activities relating to the nuclear power plants. The scope of the inspections performed at the plants during refuelling outages includes checking of the obligations of these companies.

2.8. Personnel licences

As of December 31st 2008, the number of licensed workers amounted to 9,452, with 176 holding diplomas as the heads of radiological protection services. Furthermore, 38,829 workers had CSN accreditation for the management of medical radiodiagnostic facilities and 54,877 for the operation of such installations.

The CSN awarded the following in 2008:

- For nuclear power plants: five supervisor licences, 13 operator licences and two licences for radiological protection service heads, as well as extensions for 19 operator licences and 15 supervisor licences.

- For fuel cycle and disposal facilities and installations in the dismantling phase: three supervisor licences, 15 operator licences and extensions for seven supervisor licences and four operator licences.

- For radioactive facilities: 295 new supervisor licences, 857 operator licences and seven licences for the heads of radiological protection services, as well as extensions for 68 supervisor licences and 151 operator licences.

- For medical radiodiagnostic facilities: 536 accreditations to manage and 1,548 to operate such installations.

As regards courses to obtain licences and accreditations, the CSN homologated two new courses for radioactive facilities and authorised the modification of a further three that had been homologated previously, also awarding the homologation of two new courses for X-ray facilities and the modification of one already homologated.

Controlling the delivery of these courses and the corresponding examinations gave rise to 118 inspections.

CSN Instruction IS-17 was published in February 2008, its aim being to regulate the homologation of courses for accreditation for the management and operation of radiodiagnostic facilities.

The CSN currently maintains sufficient educational material for the delivery of the courses for licences and accreditations in all fields of application relating to radioactive and radiodiagnostic facilities and makes this material freely available on its corporate website.

2.9. Uranium mining

In 2008 the CSN was required by the Regional Government of Castilla y León to issue a mandatory report on 34 requests for licences for prospecting, research and exploitation in relation to radioactive minerals, submitted in the province of Salamanca. In view of the large number of these requests and their novelty, the CSN is drawing up a set of generic radiological protection requirements, which will be available in the first quarter of 2009.

2.10. Other regulated activities

As of December 31st, 33 companies were authorised for performance of the activities

included in title VII of the Regulation on Nuclear and Radioactive Facilities in reference to the addition of radioactive substances in the production of consumer goods, the import, export, commercialisation and transfer of radioactive materials, radiation generating equipment and consumer goods incorporating radioactive substances and technical assistance in relation to such equipment and goods.

During 2008, reports were issued in relation to six new authorisations for the performance of these activities and the modification of 11 previously granted authorisations.

2.11. Activities at non-regulated facilities

Transfers to Enresa

During 2008 the CSN dealt with 15 authorisations for the transfer to Enresa of different non-authorised radioactive materials and sources. In eight of these cases, the requesting party did not have a radioactive facility.

Removal of radioactive material detected in metallic materials

As a result of application of the *Protocol on collaboration in the radiological surveillance of metallic materials,* 125 cases of radioactivity being detected in metallic materials were reported to the CSN in 2008. The radioactive sources detected, which included indicators with radioluminescent paint, ion smoke detectors, radioactive lightning rods, pieces of uranium, products containing radium and thorium and contaminated parts, were transferred to Enresa for their management as radioactive wastes.

As of the end of 2008, the number of metallurgical installations that had joined the protocol amounted to 138.

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

3.1. Radiological protection of the exposed workers

The number of exposed workers to ionising radiations dosimetrically controlled in Spain in 2008 stood at 99,747. The collective dose corresponding to these workers overall amounted to 21,508 mSv.person. This value does not include the administrative dose assessed in the event of no monthly changing of the dosimeter. If only significant doses are considered, and excluding the cases of potential exposures over the annual dose limit, the average individual dose for these workers was 0.71 mSv/year.

Of the dosimetrically controlled workers, 99.90% received doses lower than 6 mSv/year and 99.99% doses lower than 20 mSv/year.

On closure of the dosimetry year for 2008, the National Dosimetry Bank contained registers of a total of some 14,665,000 dosimetry measurements, corresponding to approximately 274,000 exposed workers and some 48,000 facilities. Each of these measurements included information on the type of facility and the type of work performed by the worker.

Throughout 2008, the CSN has distributed a total of 4,995 radiological passports for the exposed workers of 238 companies.

Table 4. Doses received by exposed workers in each of the sectors considered in the annual report for 2008

Facilities	Number of workers	Collective dose (mSv.person)	Average individual dose (mSv/year)*
Nuclear power plants			
Own personnel	1,889	438	0.87
Contracted personnel	4,827	2,311	1.19
Total dosimetry bank	6,667**	2,749	1.12
Fuel cycle facilities and waste storage facilities and research centres (Ciemat)	1,197	81	0.46
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

(*) The calculation of average individual dose considers only those workers who have had dosimeter readings in excess of the background.
(**) The sum of the own and contracted workers does not coincide with the total, since come individuals have worked at several plants and have a single entry in the dosimetry bank.

The greatest contribution to collective dose among the country's exposed workers corresponds to the medical radioactive facilities, with a value of 14,754 mSv·person, this representing 69% of the overall collective dose (21,508 mSv.person). This is the result of the number of exposed workers in the sector (79,486), 80% of the total.

Analysis of the results for the nuclear electricity generating sector indicates as follows:

a) PWR pressurised water reactors:

During the three-year period 2006-2008, a slight increase may be observed in the average collective dose per reactor, due to the fact that throughout 2008 work entailing a higher radiological burden has been carried out at Group II of the Ascó plant and to the increase in collective dose over the last three years at Trillo nuclear power plant.

Despite this, the Spanish nuclear power plants continue to show occupational dose values lower than those presented by the plants in countries of our technological reference framework.

b) BWR boiling water reactors:

Considering the collective doses per reactor for the three-year period 2006-2008, it may be observed that these have decreased with respect to the previous such period, due to the fact that in 2008 there has been no refuelling outage at either of the plants based on this technology. Nevertheless, this three-year collective dose was affected by the high value at Cofrentes during the 2007 refuelling outage due to the performance of a design modification consisting of replacing the piping system corresponding to the control rod drive system (CRDH).

The occupational doses in BWR type reactors continue to be higher than those registered in Europe, and are slightly higher than those obtained during the period 2005-2007 in this same type of reactors in the USA, the country of reference for the Spanish plants using this technology. The average individual dose for professionally exposed workers involved in transport activities (2.57 mSv/year) shows a slight decrease compared to the value obtained the previous year. The collective dose has also decreased, despite the fact that the number of dosimetrically controlled workers has increased.

In this sector doses are concentrated around the road transport of radiopharmaceutical products, in particular generators of Molybdenum-99/ Technicium. The dose level registered results from the high activity handled, due to their being short-lived isotopes produced far from the user, to the small size of the packages and their manual loading and unloading and to supply being undertaken by few companies and involving a small number of exposed workers.

During 2008 there were seven cases in which the annual regulatory dose limits for the workers were exceeded, all at radioactive facilities. These are being investigated in accordance with the established procedure.

3.2. Control of releases and environmental radiological surveillance

Control of effluents

The registration and surveillance of radioactive releases from the facilities indicate that in 2008 these remained within the habitual values, comparable to those at other European and USA installations. As in previous years, the calculated doses attributable to these releases were far below the dose limits for the public, representing a minor fraction of the release limits. In the specific case of

the nuclear power plants, this fraction did not exceed 7.5% of the authorised dose restriction of 100 μSv.

Radiological surveillance in the areas surrounding the facilities

The processing and analysis of the samples collected within the framework of the environmental radiological surveillance programmes (PVRA) implemented in the areas surrounding nuclear facilities, fuel cycle facilities and installations in the shutdown and dismantling phase implies a time lag of more than six months for acquisition of the results, for which reason this report covers the data for 2007.

In 2007, 6,512 samples were taken around the operating nuclear power plants within the framework of the environmental radiological surveillance programmes, 2,000 from around the fuel cycle facilities and 2,042 from around the facilities in the definitive shutdown, dismantling and decommissioning phase, including the José Cabrera nuclear power plant.

Table 5. Standardised activity of radioactive effluents at the nuclear power plants (GBq/GWh)*. 2008

	Gaseous radioactive effluents				Liquid radioactive effluents	
	Components				Components	
	Noble gases	Halogens	Particles	Tritium	Total except tritium	Tritium
PWR plants	$5.50\ 10^{-1}$	$3.16\ 10^{-5}$	$1.02\ 10^{-6}$	$1.94\ 10^{-1}$	$7.39\ 10^{-4}$	$3.18\ 10^{0}$
BWR plants	$2.14\ 10^{0}$	$9.21\ 10^{-4}$	$6.91\ 10^{-4}$	$2.29\ 10^{-1}$	$7.26\ 10^{-5}$	$1.21\ 10^{-1}$

(*) Average values: 1999-2008.

Table 6. Fuel cycle facilities. Activity of liquid and gaseous effluents (Bq). 2008

Effluents	Juzbado	El Cabril		Ciemat	Quercus
Liquid effluents	$1.27\ 10^{7}$	(1)		$1.74\ 10^{8}$	$1.78\ 10^{7}$
Gaseous effluents	$4.11\ 10^{4}$	Total alpha	$4.71\ 10^{3}$		
		Total beta	$1.29\ 10^{5}$		
		Gamma	LDL	$9.88\ 10^{4}$	(2)
		Tritium	$1.25\ 10^{9}$		
		C-14	$6.27\ 10^{8}$		
Calculated radiological impact	<1% of the dose restriction established	9.63% of the dose restriction established		<1% of the dose restriction established	1.08% of the dose restriction established

(1) Zero release facility.
(2) Does not generate gaseous effluents due to its being shut down.

Table 7. 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

The results of the PVRA's included in the 2007 campaign are similar to those of the previous year and the quality of the environment around the facilities is correct from the radiological point of view.

The independent environmental radiological surveillance programmes (Pvrain) carried out by the CSN as a contrast to the PVRA's did not show significant deviations with respect to the latter. The volume of Pvrain determinations represents 5% of the corresponding PVRA's, and in the case of Catalonia and Valencia their performance is commissioned to the Autonomous Community.

Special radiological surveillance programme at Ascó I nuclear power plant

The active particle emission event at Ascó required the performance of a specific radiological surveillance consisting of the following:

- Performance of internal activity measurements using a whole body counter for all those persons (professionals and visitors) who had been at the plant between November 2007 and April 2008 and all those from the nearby area so requesting. In total more than 2,700 persons were controlled and none showed any results of contamination.

- Exhaustive active particle location programme on the plant site, by the licensee in the area under its control and directly by the CSN in off-site areas. More than 1,300 particles were collected with a total activity of 409 MBq, subsequently calculated on November 26th 2007.

Radiological surveillance in the rest of the national territory

The CSN also controlled the environmental radiological quality throughout the entire country using its metering network: the automatic stations network (REA), which continuously monitors the presence of radiation in the atmosphere, and the sampling stations network (REM) (spaced and dense networks), made up of a series of laboratories, which analyses samples of river and coastal waters, the atmosphere, the terrestrial medium and foodstuffs. The values obtained are similar to those for previous years and show that the radiological conditions are correct.

Intercomparison campaigns

In order to guarantee the homogeneity and reliability of the results obtained from the different environmental radiological surveillance programmes, and given that 30 different laboratories participate in their performance, the CSN carries out periodic intercomparison exercises and promotes the standardisation of the procedures applied in the different stages of the process of measuring environmental radioactivity.

During the period 2007-2008, an environmental radiation level measurement campaign was carried out using thermoluminescent dosimeters, this including the participation of seven national and one overseas laboratory. On completion of this campaign it was concluded that all the dosimeters from all the participating laboratories met the established acceptance criteria.

A new campaign was initiated in 2008, aimed at the determination of radionuclides of natural origin in a preparation of phosphogypsum, with the participation of 34 national and three overseas laboratories.

Specific radiological surveillance programme in the Palomares area

The organisation responsible for this programme is Ciemat, which reports to the Nuclear Safety Council. The objective of the programme is the detection and supervision of possible internal contamination affecting people, and the measurement and evolution of residual contamination in the soil, all the above as a result

of the military accident involving the dispersion of plutonium which occurred in 1966.

The results of the surveillance programme carried out on people indicate that the accident had no impact on the health of the inhabitants of the area around Palomares.

Analysis of the radiological data on the area and the updated consideration of economic, social and urban planning factors have led since 2002 to the implementation of successive measures aimed at establishing adequate restrictions on land use, a more accurate radiological characterisation of the land and consideration of its possible restoration.

In this respect, the Ministers' Cabinet agreed in 2007 to temporarily occupy certain areas bordering on those expropriated in 2005 to include them in the investigation plan foreseen for the latter. In 2008, the CSN received and analysed the report by Ciemat on this additionally occupied area, concluding that there was a need to apply criteria for the restricted use of part of this land.

Specific radiological surveillance programme for the Inert Materials Recovery Centre (CRI-9) located in Marismas de Mendaña

The Inert Materials Recovery Centre (CRI-9) located in the wetlands of the Marismas de Mendaña, in the province of Huelva, carries out a radiological surveillance programme as a result of the contamination by Cesium-137 that occurred due to the accidental reception of wastes from the smelting of a radioactive source at the Acerinox plant in 1998. The results indicate that the radiological impact of the contamination on the population and the environment is insignificant.

In a resolution issued on January 30th 2008, the Directorate General for Energy Policy and Mines required the licensee of CRI-9 to implement measures for reinforcement of the contamination confinement system, the insufficiency of which had been underlined by the surveillance programme in 2007. The CSN is studying the proposals submitted by the licensee in 2008 with a view to issuing the favourable report required by this resolution.

3.3. Protection against natural sources of radiation

Compliance with title VII of the *Regulation on the health protection against ionising radiations* and of the criteria imposed for its enactment by the CSN, on the resolution of October 31st 2007, imposes upon the licensees of activities involving natural radiation sources the study of the radiological impact of their activities on the workers and the public. In order to map out this obligation and channel its compliance, the CSN started up a series of pilot studies on significant industrial activities. During 2008 the study on coal-fired thermal power plants continued and the study on the manufacturing and use of compounds of thorium came to an end.

The project on the measurement of radon gas in homes in Galicia continues, the aim being to obtain information on the content of this isotope in some 2,500 homes. Also in the community of Galicia, the project on the content of natural isotopes, among them Radon-222, in waters for public use continued.

Furthermore, in response to a request from various authorities, the CSN continued to collaborate in 2008 in the control of exposures due to natural radiation in specific activities.

- For the Regional Government of Catalonia it evaluated various aspects of the extraction, treatment and subsequent tipping of sludges contaminated with natural radioisotopes that had accumulated in the Flix reservoir, as a result of the manufacturing of bicalcium phosphate.

- Advisory services continue to be provided to the Government of the Region of Murcia on the radiological impact of the removal of the industrial wastes contaminated with natural radioisotopes located at El Hondón, in Cartagena, arising from the exploitation of phosphorite.

- In May the study performed in response to a request from the Ministry of Industry, Tourism and Trade on protection against radiations in operation of the Casablanca oil rig, located off the coast of Tarragona, came to an end. The report commends the actions taken by the operator and highlights complementary measures to improve radiological characterisation, the protection of the workers and the public and waste management.

3.4. Epidemiological study

Work continues for the joint performance between the CSN and the Carlos III Institute of Health (ISCIII), which reports currently to the Ministry of Science and Technology, of the epidemiological study on the eventual impact of the radiations emitted by nuclear facilities on the health of the population in the surrounding areas, requested by the Congress through a bill issued on December 9th 2005.

During 2008 the CSN has completed the calculations for the historic reconstruction of doses due to artificial and natural origin in the municipal areas included in the scope of this study, including the controlled zones, and the ISCIII has initiated analysis of cancer death rates in the areas under study.

In view of the progress of the works and the level of rigour required in the study, the Advisory Committee, which is made up of all the stakeholders plus six independent experts, decided that it would be necessary to extend the period for its completion and for submittal of the final report to October 2009.

3.5. Radioactive waste

Management of irradiated fuel and high level waste

The number of fuel assemblies stored in the nuclear power plant pools and in the cask storage, Individual Temporary Storage (ITS), facility at the Trillo nuclear power plant as of December 31st 2008 stood at 11,401, of which 5,076 assemblies are from boiling water reactor plants (BWR) and 6,325 from pressurised water reactor plants (PWR), this figure including the 336 assemblies from the Trillo nuclear power plant that are stored in 16 casks located in the on-site ITS facility.

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

During 2008, following authorisation of the design modification for the temporary dry storage of irradiated fuel at the José Cabrera nuclear power plant, the CSN inspected the performance of the pre-operational testing of the plant's Individual Temporary Storage facility. It also inspected the completion of the ITS storage modules manufacturing process.

Control has been maintained of the inventory of spent fuel and the operating conditions of the fuel storage pools at the nuclear power plants and at the individual temporary storage facility at Trillo.

Low and intermediate level waste management

The low and intermediate level solid radioactive wastes generated at the nuclear and radioactive facilities are managed at the El Cabril disposal facility, which is equipped with 28 disposal cells for this purpose.

During 2008, 6,127 waste packages or containment units were received at the El Cabril

Table 8. Inventory of irradiated fuel at the Spanish nuclear power plants and situation of the corresponding storage facilities at the end of 2008

	José Cabrera	Garoña	Almaraz I	Almaraz II	Ascó I	Ascó II	Cofrentes	Vandellós II	Trillo	
									Pool	ITS
Assemblies in storage	377	1,860	1,140	1,068	1,036	1,016	3,216	840	512	336
Degree of occupation	68.80	84.20	69.22	64.85	81.96	80.38	90.29	58.46	81.50	20%
Year of pool saturation	NA (1)	2015	2021	2022	2013	2015	2009	2020	NA (2)	–

(1) The plant has been in the definitive shutdown situation since April 2006. The fuel assemblies will be loaded in HI-STORM casks and transferred to the ITS facility. (The date of saturation would have been 2015).
(2) There is no problem of pool saturation due to the existence of the ITS facility.

Table 9. Radioactive waste packages generated at the nuclear power plants and disposed of El Cabril in 2008

Facility	Conditioned activity (GBq)	Packages generated	Packages removed
José Cabrera (a)	1,307.10	206	966
Sta. Mª Garoña	28,848.80	335	833
Almaraz I y II	1,835.86	550	445
Ascó I y II	4,068.14	410	504
Cofrentes	3,945.16	765	969
Vandellós II	126.86	156	420
Trillo	286.28	157	273
Totals	40,418.2	2,579	4,410

(a) A CMT type cask (1,300 litres) was generated at the José Cabrera nuclear power plant with non-compactable solid radioactive waste. The conditioned activity being 1.25 E-02 GBq.

facility, plus 16 samples of low and intermediate level wastes:

- 4,506 packages and 16 samples from nuclear facilities.
- 1,620 packages or containment units from radioactive facilities.
- One containment unit corresponding to incidents at steelyards.

In 2008 the operating nuclear power plants generated waste of this type with an estimated activity of 40,418.20 GBq, conditioned in 2,579 waste packages.

The CSN maintained control of the radioactive waste treatment and storage systems and of the type package acceptance processes. During 2008, six specific inspections were carried out at nuclear facilities.

The management by Enresa of atypical radioactive wastes was also tracked by the CSN. This includes the non-authorised radioactive substances and contaminated metallic materials described in section 2.11 and radioactive lightning rods, of which 67 were removed in 2008.

Finally, as regards very low level wastes, the CSN has continued to watch over the initiation of operations on the East platform at El Cabril, as well as the management of uranium concentrate plant tailings and the restoration of uranium mines.

Particularly significant in this last area has been the favourable report issued by the CSN on the surveillance and maintenance programme of the Valdemascaño mine, following its restoration, and the continuation of the licensing process for the restoration of other mines, especially the one at Saelices el Chico, where work was completed in 2008. During the last year, the supervision of these activities entailed the performance of seven inspections, three at Saelices el Chico and the remainder at disused uranium mines.

3.6. Emergencies and security

3.6.1. Emergencies

In addition to its regulatory function, aimed at ensuring the capacity and preparedness of the licensees of nuclear and radioactive facilities to address emergency situations, the CSN is part of the national emergencies system for all matters relating to nuclear safety and radiological protection.

Participation in the national emergencies system

The CSN coordinates and collaborates with the other parties making up the national emergencies system, especially with the Directorate General for Civil Defence and Emergencies and with the delegations and sub-delegations of the Government in provinces housing nuclear facilities, as well as with the Autonomous Communities and the Military Unit for Emergencies (UME). In addition, it makes its Emergency Response Organisation (ERO) available to this system and is responsible for Spanish participation in international organisations and agreements in this area.

The following activities were particularly significant in relation to this aspect in 2008:

- The first meeting of the Technical Commission for the supervision of the specific collaboration agreement between the CSN and the Directorate General for Civil Defence and Emergencies of the Ministry of the Interior, signed in 2007, was held, agreement being reached regarding the promotion of joint activities for the training of those required to act in nuclear and radiological emergencies and the performance of general drills.

- The CSN collaborated with the UME in the design, preparation and performance of the CPX 08 exercise, which simulated a major forest fire scenario involving several communities, reaching emergency level 3, affecting the Cofrentes nuclear power plant and implying the preventive activation of the Penva plan and the ERO of the CSN.

- A collaboration agreement was established with the Regional Government of Catalonia for planning, preparedness and response to radiological emergency situations. Subsequently, an information exchange protocol was signed for the enactment of this agreement, this now being fully implemented.

- Participation in the training of nuclear, radiological, bacteriological and chemical (NRBQ) specialists reporting to the Ministry of

the Interior (Civil Guard and National Police Force) and the Ministry of Defence.

- Within the framework of the initial and on-going training programme for nuclear emergency response personnel, the CSN participated in the adaptation and delivery, on two occasions, of a course drawn up by the European Union, and at least one theoretical and practical session was held for each of the nuclear plans, aimed at the radiological groups. Furthermore, Theoretical-Practical Sessions on Municipal Emergency Response were carried out within the framework of the Penva.

- The Directorate General for Civil Defence and Emergencies CSN participated in four European Union Ecurie exercises, three at level 1 and one at level 3, coordinating where appropriate the intervention of other Spanish organisations, and in four International Atomic Energy Agency Convex exercises at international level.

The maintenance of the Emergency Response Organisation implied the following in 2008:

- The permanent operability of the CSN Emergency Room (SALEM), 24 hours a day and 365 days a year.

- The permanent capacity to act *in situ* in the event of a nuclear or radiological emergency, through immediate response technical teams provided by a company expert in radiological protection (authorised RPTU) contracted by the CSN.

- Availability for intervention at any point within the national territory of the mobile environmental radiological surveillance units of Ciemat and the Regional Government of Extremadura, for the performance of radiation and environmental contamination measures in areas potentially affected by a nuclear or radiological emergency.

- Availability of a mobile personal internal dosimetry service, including two whole body counters for measurement of internal doses of persons possibly affected by internal contamination as result of a nuclear or radiological emergency anywhere in the national territory.

- Supply of 3,000 electronic direct reading dosimeters (EPD) and 28 reading units for the participants in the five off-site nuclear emergency plans, as well as management and maintenance of all the radiometric equipment making up the material for these emergency plans.

Regulatory activities

- In 2008 all the nuclear power plants and facilities carried out their obligatory site emergency drills under the supervision of the CSN, this entailing the activation of the Salem.

- A draft safety guide on the contents of the site emergency plan for all types of radioactive facilities has been drawn up and is currently in the phase of external comments.

- Proposals for changes to the site emergency plans of the nuclear facilities were evaluated, this affecting the following: Ascó, Ciemat, Cofrentes, El Cabril, the Juzbado fuel assembly manufacturing facility, Trillo, Vandellós I and Vandellós II and the Quercus fuel cycle radioactive facility.

Incidents

Three emergency pre-alert reports were received at the CSN Emergency Room (Salem) in 2008:

- One from Cofrentes nuclear power plant, on April 7th, due to the opening of a primary circuit relief and safety valve. In view of the short duration of the event (eight minutes), the ERO was not activated.

- Another, also from Cofrentes nuclear power plant, on July 10th, also due to the opening of a primary circuit relief and safety valve, the ERO being activated in mode 1. All the safety systems of the facility acted as per their design and the event did not imply any impact for the workers or the environment.

- From Vandellós 2 nuclear power plant, on August 24th, due to a fire lasting more than 10 minutes in the turbine building. The pre-alert caused activation of the PENTA plan in situation 0 and activation of the CSN's ERO in mode 1. The extinguishing of this fire allowed the plan to be deactivated after 37 minutes.

The Salem is the entry route for the notifications of incidents required by the international agreements and also, given its operability and communications resources, for most of the national notifications of events and incidents at nuclear and radioactive facilities and in transport. As regards the first, on June 4th an Ecurie Alert was received as a result of a leakage of reactor coolant to the containment building at the Krsko plant (Slovenia), without any emissions occurring to the environment.

3.6.2. Security of nuclear materials and facilities

During 2008 the CSN has carried out the following activities, among others:

- Work continued on the process of adapting the nuclear facilities to CSN Instruction IS-09 on security, with compensatory conditions being established pending full implementation of the standard.

- In relation to standards, the CSN participated in the inter-ministerial working group for the adaptation of Royal Decree 158/1995 to the Amendment to the IAEA Convention on Security dealing with the security of nuclear materials.

- Within the framework of the Association of European Security Regulators, the CSN joined the working group on the unification of security criteria for radioactive facilities housing high activity sealed sources.

- The CSN collaborated with various national and overseas institutions in training and know-how exchange activities relating to the security of nuclear and radioactive materials and facilities, particularly significant being the collaboration with the Secretariat of State for Security for the preparation and performance of the FTX 08 exercise associated with the Global Initiative against nuclear terrorism.

- The security systems of the following facilities were inspected: the Ascó and Vandellós II nuclear power plants, the irradiated fuel dry storage (ITS) facility at the José Cabrera plant, the El Cabril waste disposal facility, the Juzbado fuel assembly manufacturing facility, the Ciemat nuclear installation and the radioactive irradiation facility belonging to Aragogamma, S.A.

4. External relations

4.1. Public information and communication

The most important activities carried out in 2008 were as follows:

- CSN website: the site has received 201,783 visits during the year and preparations were made for the implementation of a new more friendly and accessible website.

- Information for the population: response to 963 external queries and 207 requests for publications made via the CSN website.

- Information for the media: the issuing of 172 informative bulletins and 48 notes or outlines on reportable events on the CSN website, and response to more than 1,500 requests for information.

- Information Centre: 6,740 visitors and the renewal of four informative modules.

- Publications: Publishing of 54 documents (50,650 copies) and the re-publishing of a further 12 (23,200 copies), with a total distribution of 79,747 technical and informative publications and the handing out of 23,667 copies to visitors to the Information Centre. In 2008 special efforts were made in the translation of documents relating to the IRRS Mission and in the publishing of a new journal, *Alpha, nuclear safety and radiological protection*, in order to facilitate understanding and awareness of the CSN's activities.

- Congresses and exhibitions: CSN presence and stand with publications at the *9th Madrid is Science Fair*, the *5th Session on quality in the control of environmental radioactivity*, *Fisalud 2008* and *CONAMA-9*.

- Conferences: organisation of two subject-specific conferences on nuclear reactors in the 21st century and molecular biology and biomedicine.

4.2. Institutional relations

The most important activities carried out in 2008 were as follows:

Parliament

- Annual report: submittal to the Congress and Senate of the CSN annual report for 2007, on July 10th 2008.

- Appearances: By the nuclear safety and radiological protection technical directors (commissioned paper on relations between the CSN and the Parliamentary Commission for Industry, Tourism and Trade, on November 19th, in relation to the annual report for 2007) and by the President of the CSN (Parliamentary Commission for Industry, Tourism and Trade, on June 11th, to report on the particle emission event at the Ascó I plant, and on November 26th, in relation to the annual report for 2007; and Parliamentary Commission for Industry, Tourism and Trade, on October 21st, to report on the proposed initiation of sanctions proceedings against Ascó I nuclear power plant for the emission of particles, the fire in the alternator at the Vandellós II plant and the annual report for 2007, among other matters).

- Resolutions by the Parliamentary Commission for Industry, Tourism and Trade: response to 32 Resolutions in relation to the annual report on activities in 2006, of the 39 expressly addressed to the CSN; response to 13 Resolutions of a periodic nature or corresponding to annual reports previous to 2006, and response to five

Resolutions corresponding to the Vandellós incident on August 25th 2004, completing the response to all the Resolutions issued regarding this matter.

- Parliamentary questions: replies to 30 parliamentary questions by the political groups of the Congress and Senate.

- Council Instructions: communication to Congress, prior to approval, of four Council Instruction proposals.

Central Administration

- Ministry of Industry, Tourism and Trade: Commission presided over by the Minister and with the attendance of the secretary general for energy, the president of the CSN, the president of the CNE and the chairman of REE, to analyse the situation of the Spanish nuclear fleet in relation to safety and investments, with representatives of the electricity industry. The bases were established for the setting up of working groups to gain insight into the investment processes of the plants, to exchange information and to analyse resources management procedures.

- Ministry of Industry, Tourism and Trade: annual meeting with representatives of the autonomous communities with functions and services assigned in relation to 2nd and 3rd category radioactive facilities (April 9th), and participation in the Spanish energy policy review meetings organised by the OECD International Energy Agency.

- Ministry of the Interior: setting up of the Mixed Commission for tracking of the Framework Agreement on emergency management and security (January 11th) and of the Technical Committee for tracking of the Specific Agreement signed with the Directorate General for Civil Defence and Emergencies (December 3rd).

- Ministry of Education, Social Policy and Sport: signing of an addendum to the agreement of April 23rd 2003 on the training of secondary school teachers (June 4th).

- Ministry of Science and Innovation: meetings with the Advisory Committee (October 30th) and the Mixed Coordination Commission of the Collaboration Agreement with the Carlos III Institute of Health for the performance of an epidemiological study (April 2nd, July 29th, September 19th and December 16th).

Autonomous administrations

- Function assignment agreements: meetings with the mixed commissions, entry into force of the extension to the assignment agreement with the Autonomous Community of Valencia (July 30th) and addenda on the control of transport with the Canary Islands (July 30th), Galicia (September 15th) and the Balearic Islands (September 19th), and on documentary management with the Balearic Islands (September 19th) and Catalonia (February 28th).

- Autonomous governments: signing of a collaboration agreement in relation to planning, preparedness and response to radiological emergency situations with the Regional Government of Catalonia (January 10th), and setting up of the corresponding mixed parity commission and protocol for the exchange of information with the said Regional Government on radiological emergency events and situations.

Local administrations

- Association of Municipal Areas in the Vicinity of Nuclear Power Plants (AMAC): meeting with the Board of Governors of AMAC (September 23rd) and drawing up and dissemination of an opinion poll on nuclear energy and related organisations (April 1st).

- Local Information Commissions: participation in the meetings held at Ascó (January 16th), Almaraz (February 7th), José Cabrera and Trillo (February 19th).

- Information Committees: participation in the meetings held at Cofrentes (April 8th), Trillo (May 6th), Almaraz (May 20th), José Cabrera (June 10th), Ascó and Vandellós II (September 10th) and Santa María de Garoña (November 6th).

Entities, organisations and social groups

- CSN-Unesa liaison committee: meeting for the joint review of relevant incidents, operating indicators and their trends and special on-going action plans. The licensees undertook to carry out specific analyses at each plant to set up complementary improvement programmes reinforcing resources and investments.

- State Coordinator of Nuclear Power Plant Workers' Committees and National Confederation of Nuclear Power Plant Workers' Committees: meetings on personnel training and other issues. Also, CSN participation in the meeting of the Workers' Committee at Ascó.

- FER and UNESID: meeting with the executive committees for organisation of the International Conference on the control and management of radioactive materials in scrap (December 12th).

- Environmental protection and sustainable development non-governmental organisations: meetings with Greenpeace and Adena on the situation of the inert materials recovery centre CRI -9 (January 22nd), with Ecologistas en Acción to report on the publication of documents via the CSN website as a transparency enhancement measure (January 31st) and with Adenex to report on the incident at the Almaraz plant (May) and responses to requests for information.

Subsidies

In 2008 the CSN awarded a total € 57,000 to the eight projects selected in the call for requests for aid for training, information and educational activities relating to nuclear safety and radiological protection. These subsidies, granted pursuant to the General Subsidies Act, Law 38/2003, have been reported to the IGAE.

4.3. International relations

The most important activities carried out in 2008 were as follows:

European Union

- Participation in the European Nuclear Safety Regulators Group (ENSREG), formerly the European High Level Group on Nuclear Safety and Radioactive Waste Management, the objective of which is to harmonise practices in this area. At the end of the year the European Commission submitted a proposal for a directive on nuclear safety.

- Participation in the project for assistance to the Ukrainian regulatory body, in relation to personnel training, emergency response and standards development programmes completed in 2008.

International Atomic Energy Agency (IAEA)

- Hosting of the Integrated Regulatory Review Service (IRRS), from 28th January to 8th February, and organisation of the technical workshop on "Lessons Learned from IRRS Missions", held in Seville on November 3rd and 4th.

- Promotion of cooperation in the Mediterranean Area for the strengthening of regulatory infrastructures for the control of radioactive sources in Northern African countries (Algeria, Egypt, Libya, Morocco, Mauritania and Tunisia), and initial coordination meeting with

France, Italy and the IAEA for the definition of bases for this cooperation.

- Preparations for the International Conference on the control of scrap, to be held in Tarragona in February 2009, in collaboration with the IAEA.

- Contribution of € 498,000 for assistance projects, especially in Latin America and Northern Africa.

Nuclear Energy Agency (NEA-OECD)

- Participation in 14 research projects, in the meetings of the CNRA and CSNI committees and in the events marking the 50th Anniversary of the NEA.

International Conventions

- Convention on nuclear safety: presentation of the Fourth National Report within the framework of the 4th Review Meeting of the Convention, held in Vienna in April 2008.

- Joint convention on safety in the management of spent fuel and safety in the management of radioactive waste: collaboration in the drawing up of the Third National Report, submitted to the IAEA in October, to be presented during the 3rd Review Meeting of the Convention in May 2009.

Regulatory associations

- International Nuclear Regulators Association (INRA): six-monthly meetings in Washington (May) and San Antonio, Texas (December), during which issues of interest such as emergency preparedness, the need for an international operating experience system, the problems involved in the international supply of radioactive isotopes, the degradation of nuclear power plant structural materials and the safety culture in operating companies were dealt with.

- Western European Nuclear Regulators Association (WENRA): plenary meetings in Bucharest and Prague, during which on-going projects were reviewed, a new design proposal for new reactors was launched and relations with ENSREG, and especially with the proposed directive on nuclear safety, were dealt with.

- Latin American Radiological and Nuclear Regulatory Organisations Forum (Foro): plenary meeting in Montevideo (May), during which on-going projects and the budget for 2009 were approved.

- European Radiological Control Association (ERCA): meetings in relation to the new international standards on radiological protection currently under development at various international agencies, and on progress in the review and unification of European Union directives on radiological protection.

Bilateral relations

- United States: participation in the *Annual Regulatory Information Conference* (RIC-2007) of the *Nuclear Regulatory Commission (NRC)*, within the context of which high level institutional contacts were made between the representatives of the CSN and the NRC, and a meeting between the Presidents of the two organisations within the framework of the IAEA General Conference, during which specific agreement was reached regarding nuclear power plant lifetime management and the exchange of information on public communication.

- France: participation in crossed inspections between the CSN and the French nuclear safety authority (ASN) and exchange of personnel. In October a member of the CSN technical staff travelled to the ASN for a nine-month period of residence, in order to gain detailed insight into French practices in relation to lifetime extension

and primary and secondary chemistry at nuclear power plants.

- China: hosting of a visit by the Chinese regulatory body for renewal of the bilateral agreement. An initial agreement was reached and a draft was drawn up, the definitive version of which is to be signed in China during a bilateral meeting.

5. Research and Development

One of the functions of the Nuclear Safety Council is to establish and carry out the tracking of research plans in the field of nuclear safety and radiological protection, the ultimate aim being to guarantee the continuous technical independence attributed to it in its regulatory task.

The CSN Research and Development Plan is the instrument by means of which the conditions under which the CSN's research and development activities are to be carried out during each four-year period are established.

In 2008, the Plan for the period 2008-2011 was approved, with the following objectives:

- To contribute to ensuring a high level of nuclear safety and radiological protection at the existing facilities, through to the end of their service lifetimes.
- To improve the surveillance and control of worker and public exposure to ionising radiations.
- To continue progressing in the development of radiological protection in medical exposures.
- To make available the know-how and technical resources required to appreciate the risks associated with future facilities.

The Plan is structured around eight programmes or courses of action:

- Nuclear fuel and reactor physics programme.
- Safety assessment modelling and methodologies programme.
- Materials behaviour programme.
- Programme relating to new technologies.
- Radioactive waste programme.
- Programme on the control of exposures to radiation.
- Dosimetry and radiobiology programme.
- Emergency management and incident analysis programme.

In 2008 the CSN has worked on the performance of a total 43 R&D projects.

Of these, 13 were completed in 2008, nine were started during the year and 21 initiated in previous years were continued.

The budget for CSN R&D activities in 2008 amounted to 2.1 million euros.

6. Regulations and standards

Work has continued in 2008 on the drawing up of Council Instructions (IS), with four new instructions approved during the year:

- Nuclear Safety Council Instruction IS-16, of January 23rd 2008, regulating the periods of time during which the documents and registers of radioactive facilities should remain in the archive (Official State Gazette number 37, February 12th 2008).

- Nuclear Safety Council Instruction IS-17, of January 30th 2008, on the homologation of training courses or programmes for the personnel managing or operating X-ray facility equipment for the purposes of medical diagnostic and the accreditation of the personnel of such facilities (Official State Gazette number 43, February 19th 2008).

- Nuclear Safety Council Instruction IS-18, of April 2nd 2008, on the criteria applied by the Nuclear Safety Council to require the licensees of radioactive facilities to report on radiological events and incidents (Official State Gazette number 92, April 16th 2008).

- Nuclear Safety Council Instruction IS-19, of October 22nd 2008, on the requirements of the nuclear facility management system (Official State Gazette number 270, November 8th 2008).

Likewise, work has continued on the drawing up of Safety Guides (GS), with two having been approved during the year:

- Safety Guide GS-01.10. Revision 1. *Periodic safety reviews at nuclear power plants*.

- Safety Guide GS-09.03. *Contents and criteria for the drawing up of radioactive waste management plans at nuclear facilities*.

In 2008, several provisions affecting the regulatory framework of the CSN were approved and officially published, the following being particularly significant:

- Royal Legislative Decree 1/2008, of January 11th, approving the reworded text of the Law on the Assessment of the Environmental Impact of projects.

- Royal Legislative Decree 35/2008, of January 18th, modifying Royal Decree 1836/1999, of December 3rd, which approved the Regulation on Nuclear and Radioactive Facilities.

The CSN has participated in the promotion and driving of several standards projects of different standing, the following warranting special mention:

- Draft Royal Decree approving the new CSN Estatute.

- Modification of the Regulation on the Protection of Health against Ionising Radiations (Royal Decree 783/2001, of July 6th).

- Draft Royal Decree on the Use and Installation of X-ray equipment.

- Draft Royal Decree on the Security of Nuclear Materials.

- Draft Royal Decree on the development of article 37 of the Nuclear Energy Act.

- Draft Royal Decree governing the transposition of Directive 2006/117/Euratom, in relation to the surveillance and control of shipments of radioactive waste and spent nuclear fuel.

As regards standards development at international level, the CSN has continued to participate in the following processes:

- Drawing up of IAEA Guides and collaboration with the IAEA to make the aforementioned Guides available to the Spanish-speaking community.
- Activities within the framework of the WENRA working groups in relation to the harmonisation of European standards in the field of nuclear safety.

7. Management of resources

7.1. Improvement of the CSN organisation and plans

Improvements to the internal organisation of the CSN

a) *IRRS*

Particularly significant in this area in 2008 have been the activities relating to the IAEA's IRRS (Integrated Regulatory Review Service) mission and its results.

The mission took place between January 28th and February 8th, the assessment team comprising 23 highly qualified experts from 15 countries, 18 of whom were specialists from different competents authorities similar to the CSN, three were IAEA staff members and two acted as observers, representing Chile and Portugal.

The objective of the mission was to review the Spanish regulatory framework and the overall scope of the CSN's regulatory activities, covering all regulated sources, facilities and activities, to revise its regulatory efficiency and to exchange information and experiences in the areas covered by the mission, through the evaluation of the efficiency of the regulatory framework and of good practices.

The review was carried out by comparison with the IAEA's safety standards and guidelines on technological safety and security and with the relevant conventions, as an international benchmark on safety and security.

The results of the mission are included in the IAEA report *Integrated Regulatory Review Service (IRRS) to Spain*, a document published by the CSN in English and Spanish and made public during the mission results presentation event held in Seville in early November.

As regards the overall results, the IAEA report has identified 19 good practices[1], exportable to other countries, 27 suggestions[2] and five recommendations[3] aimed at continued improvement of the Spanish regulatory system, as well as a series of suggestions, in those cases in which improvements are necessary or desirable to continue to increase the efficiency of the regulatory controls.

The report identifies the following god practices:

- The legal provisions existing and relating to the responsibility of the licensee.
- The development and use of probabilistic safety assessment (PSA) as a regulatory tool.
- The existence of forums for dialogue with the stakeholders in relation to radiological protection.
- The process of systematically evaluating international standards.
- The process of tracking standards development in the country of origin of the technology.
- The availability of material on radiological protection on the CSN website.
- The efficiency and transparency of the inspection programmes.

[1] Good practices are understood to be those identified by the review team as being better than most and that they consider should be known by other countries for them to be taken into account in improvement processes.

[2] The suggestions are actions to be taken into account for improved compliance with the IAEA guidelines.

[3] Recommendations are actions to correct deviations with respect to the requirements of the IAEA guidelines.

- The clarity, ease of understanding and exhaustive nature of the results of the SISC published on the CSN website.

- The transparency in the publishing of inspection reports on radioactive and X-ray facilities.

- The rigour and competence shown in the control of wastes and releases and in the protection of persons and the environment.

- The effectiveness of the management of disused radioactive sources.

- The coherent and stable policy of the national campaigns for the recovery of orphan sources.

- The integrated workers dosimetry control system.

- The implementation of an effective framework for the management of emergencies in the metal recycling sector as a result of non-controlled sources (Scrap protocol).

- The management of radioactive transport control activities.

- The proactive attitude adopted in providing information to the stakeholders in radioactive material transport.

- The existence of a General Waste Management Plan at national level.

- The infrastructure acquired to address the dismantling of facilities.

- The availability of a well developed management system.

The report makes the following recommendations:

- Implementation of a systematic process of gathering and evaluating the information arising from the control and inspection of nuclear facilities and periodic provision to the licensees of the results of authorisations.

- Implementation of a systematic process of gathering and evaluating the information arising from the control and inspection of radioactive facilities and X-ray installations and periodic provision to the licensees of the results of authorisations.

- Collaboration with the competent authorities in the development and communication of plans for the definitive disposal of high level radioactive waste and contribution to the establishment of objectives and conditions of all types regulating the decision-making process and unnecessary delays in a solution to the problem, and improvement of estimates of the future costs of final waste management.

- Formalisation and implementation of a programme of internal audits of management processes. The programme should contemplate the auditing of all the processes in a given time period. CSN personnel duly trained in this area should be available in support of this programme. In addition, the CSN should develop and formalise a systematic approach to the management of deficiencies in processes and products.

- Development of a methodology and performance of revisions of the management system at regular intervals, scheduled by the CSN or external personnel. The programme should guarantee the usefulness and efficiency of the management system overall and allow for compliance with the objectives of the organisation.

In response to the forty-first Resolution approved by the Commission for Industry, Tourism and

Trade during its session of December 12th 2007, the President of the CSN reported on the results of the IRRS mission and the actions to be adopted by the CSN during her appearance before this Commission in November 2008.

The actions required to implement the recommendations and suggestions of the IRRS mission have been incorporated in the CSN Action Plan and are periodically tracked by the Organisation's Management System Committee.

Furthermore, and in compliance with the seventh resolution of the Commission for Industry, Tourism and Trade, approved during the session held on December 16th 2008, the CSN will report to this Commission on the action plan and the degree of implementation of the improvements deriving from the IRRS.

In 2011, the IAEA will check the implementation of the improvements made as a result of the mission's recommendations and suggestions.

b) Other improvements

Another significant improvement incorporated during 2008, in addition to the IRRS, has been the establishment of a basic audit plan, in accordance with which all the processes of the organisation are covered by an internal audit every three or four years, depending on their relevance. The internal audit procedure has been updated to adapt it to the ISO 19011:2002 standard and a training programme has been set up for internal auditors. Seven audits are scheduled for 2009.

In the case of processes entailing assigned activities, the audits will include the activities of the respective Autonomous Communities.

Strategic Plan and Annual Work Plan

The planning module implemented at the CSN contemplates the integration of the Annual Work Plan (AWP) in the Strategic Plan. This integration is accomplished by way of the directives and objectives established by the Council for each year. The AWP for 2008, approved by the Council on January 9th, was prepared in accordance with this model, including the objectives for 2008.

As a mechanism for tracking of the AWP there is a control panel that takes the numerical values of the indicators established for this purpose and corresponding to the most significant activities in the AWP and compares them to the objectives previously mapped out.

During 2008, 30,085 hours were dedicated to planning and management, this implying approximately 7% of the total number of hours put in by the CSN personnel.

On completion of the IRRS mission, the process of updating the CSN Action Plan began, this including the actions required to implement the recommendations and suggestions of the mission. These actions are periodically monitored by the Organisation's Management System Committee and will be included in future AWP's.

Training plan

The training plan for 2008 was grouped around six major areas: nuclear safety, radiological protection, the development of management skills, organisation and communication, standards, administration and management, information systems and quality and languages. The total number of hours dedicated to training by the CSN personnel was 46,331, 18% more than in 2007, with a cost of 682,448 euros, an average cost of 1,510 euros per person.

During 2008 a competence-based management model applied to training was designed, which will allow training to be improved by identifying the individual training needs of the members of the CSN personnel, and efforts continued in promoting the presence of the CSN personnel at

national and international events relating to their respective functions and areas of competence.

7.2. Resources and means

Human resources

As of December 31st 2008, the total workforce of the Council amounted to 468 persons, 3% more than in the previous year. The number of women working at the CSN has once again increased, now standing at almost 51% of the total, and 65% of the CSN personnel are post-graduates.

By way of the Resolution issued by the Presidency of the Nuclear Safety Council on April 18th 2008, a selection process was initiated to cover 20 vacancies, by way of the general system of open access to the Nuclear Safety and Radiological Protection Technical Stall.

By way of the Resolution issued by the Nuclear Safety Council on May 29th, the five candidates who passed the process of selection initiated by the Nuclear Safety Council Resolution of March 22nd 2007 were appointed as civil servants belonging to the Nuclear Safety and Radiological Protection Technical Stall.

The year 2008 saw the third application of the model for recognition of the professional experience of the Organisation's civil service staff, affecting 16 such professionals.

Economic resources

The economic aspects are broken down into budgeting items and financial aspects, the accounting of the organisation being undertaken in accordance with the *General public accounting plan*.

a) Budgeting aspects:

The definitive budget of the CSN for 2007 amounted to 45.2 million euros, an increase of 3.24% over the previous year and with no modifications with respect to the initial budget.

The recognised rights corresponding to the heading of fees, public prices and other revenues amounted to 39.2 million euros, with a degree of execution of 99.77%, and those corresponding to current transfers to 5.2 million euros, with a degree of execution of 99.24%.

Execution of the expense budget increased by 3.29% over the previous year.

b) Financial aspects:

Expenses were distributed as follows in 2008:

- Personnel expenses: 56.34%.
- External services: 32.63%.
- Transfers and subsidies: 4.46%.
- Provisions for amortisation: 4.33%.
- Other expenses (transfers to provisions, taxes, financial costs and extraordinary expenses): 2.24%.

Revenues were distributed as follows in 2008:

- Fees for services rendered: 85.42%.
- Other income (current subsidies and transfers, financial revenues and other management revenues): 14.58%.
- The result for the year was positive by 2.6 million Euros.

Information systems

The most significant activities carried out in 2008 were as follows:

- Implementation of a single authentification system for systems allowing for digital certificates.

- Installation of access to the CSN via private virtual networks for autonomous communities having functions assignment agreements and for the resident inspectors of the CSN.

- Project for the adaptation of the services rendered by the CSN to the administrated parties to the requirements of the Law on Electronic Access to Public Services (LAECSP).

- Backing for the development of a new CSN website.

- Improvement of various CSN support systems.

Annex I. Main Nuclear Safety Council Plenary agreements in 2008

Meeting	Date	Agreements
1,062	16/01/08	Approval of the action proposal regarding the Inert Materials Recovery Centre (CRI-9) at Marismas de Mendaña in Huelva
1,063	23/01/08	Approval of Council Instruction IS-16 on archive retention periods for radioactive facility documents and records.
1,064	30/01/08	Approval of Council Instruction IS-17 on the homologation of training courses for the personnel of X-ray facilities.
1,068	05/03/08	Approval of the design modification for increased maximum burnup of the SVEA-96 OPTIMA 2 fuel pellet at Cofrentes nuclear power plant, as a result of the increase of the operating cycle from 18 to 24 months.
1,068	05/03/08	Approval of the temporary change of the Cofrentes nuclear power plant security alarms centre in relation to the implementation of CSN instruction IS-09.
1,068	05/03/08	Favourable report for the start-up the design modification corresponding to the individual radioactive waste temporary storage facility at José Cabrera nuclear power plant.
1,070	26/03/08	Approval of application of the methodology of Regulatory Guide 1,195 at Almaraz nuclear power plant for the calculation of radiological consequences in the event of an accident and the habitability of the control room.
1,070	26/03/08	Favourable report on the plan for the control of declassifiable materials from the Pimic-Dismantling process.
1,071	02/04/08	Approval for the suspension of operations at the EURO RPTU.
1,071	02/04/08	Approval of Council Instruction IS-18 on the notification of events at radioactive facilities.
1,074	16/04/08	Approval of exemptions from the official operating documents at Trillo nuclear power plant in relation to the bringing forward of the refuelling outage.
1,076	29/04/08	Favourable report on the operating permit for the Alba Synchrotron radioactive facility.
1,076	29/04/08	Approval of the action proposal in relation to radiological characterisation of the surface in the Palomares area.
1,077	14/05/08	Approval of CSN Guide GS-09.03 on contents and criteria for the drawing up of radioactive waste management plans at nuclear facilities.
1,080	18/06/08	Favourable report on the action plan of the Asociación Nuclear Ascó-Vandellós (ANAV) in response to the event involving the release of radioactive particles at Ascó nuclear power plant.
1,080	18/06/08	Favourable report on the design modification for the very low level radioactive waste disposal installation at the El Cabril Disposal Facility.
1,082	09/07/08	Favourable report on the design modification for the re-racking of the irradiated fuel storage pool at Cofrentes nuclear power plant.
1,083	15/07/08	Approval of a special radiological surveillance programme at nuclear power plant sites.
1,086	18/08/08	Approval of a proposal for the initiation of sanctions proceedings against Ascó nuclear power plant for the radioactive particle release event.
1,087	11/09/08	Approval of the project for the new Charter of the Nuclear Safety Council.
1,088	24/09/08	Approval of the complementary technical instruction for Trillo nuclear power plant in relation to the design modification for primary circuit bleed and feed.
1,088	24/09/08	Approval of the revision of CSN Guide GS-01.10 on periodic safety reviews at nuclear power plants.

Meeting	Date	Agreements
1,090	08/10/08	Favourable report on the use of alternatives to ASME XI and the code cases for the weld overlay of pressuriser nozzles at Ascó II nuclear power plant.
1,091	22/10/08	Approval of Council Instruction IS-19 on the requirements of the nuclear facility management systems.
1,093	12/11/08	Approval of the proposal for sanctions proceedings against the company Cualicontrol-ACI, S.A.
1,094	18/11/08	Approval of the complementary technical instruction for Almaraz nuclear power plant in relation to the conditioned application standards.
1,094	18/11/08	Approval of revisions of the operating regulations for the Ascó and Vandellós II nuclear power plants as a result of an important reorganisation of the Asociación Nuclear Ascó Vandellós (ANAV).
1,095	25/11/08	Approval of the project for the validation of low and intermediate level radioactive waste scaling factors in relation to the declassification of waste materials.
1,096	03/12/08	Approval of the proposal for the modification of the Regulation on Nuclear and Radioactive Facilities (NRF) in relation to the suitability of nuclear power plant personnel.
1,096	03/12/08	Approval of the proposal for the modification of the Regulation on the Health Protection against Ionising Radiations (RPHIR) in relation to natural radiation.
1,098	17/12/08	Approval for the application at Ascó nuclear power plant of the methodology of Regulatory Guide 1.195 for the calculation of radiological consequences in the event of an accident and habitability of the control room.

Annex II. List of abbreviations and acronyms

ADENA:	Asociación para la Defensa de la Naturaleza (Association for Nature Protection).
AMAC:	Asociación de Municipios de Áreas de Centrales Nucleares (Association of municipal areas in the vicinity of nuclear power plants).
ANAV:	Asociación Nuclear Ascó-Vandellós II (Ascó-Vandellós II Nuclear Association).
ASME:	American Society of Mechanical Engineers
ASN:	Autorité de Sûreté Nucléaire (French nuclear safety authority).
AS1:	Ascó I nuclear power plant.
ASN:	Automatic Stations Network.
AWP:	CSN Annual Work Plan.
BIP:	CSN Basic Inspection Plan.
Bq:	Becquerel.
BWR:	Boiling Water Reactor.
CELLS:	Consortium for the construction, equipping and operation of the synchrotron light laboratory (Consorci per a la Construcció, Equipament i Explotació del Laboratori de Llum de Sincrotró).
Ciemat:	Centro de Investigaciones Energéticas, Medioambientales y Tecnológicas (Centre for Energy-Related, Environmental and Technological Research).
CONAMA:	Congreso Nacional del Medio Ambiente (National Congress for the Environment).
CPX:	Command Post Exercise (NATO nomenclature).
CRDH:	Control rod drive housing.
CRI:	Centro de Recuperación de Inertes (Inert materials recovery centre).
CSN:	Consejo de Seguridad Nuclear (Nuclear Safety Council).
Ecurie:	European Community Urgent Radiological Information Exchange System.
Enresa:	Empresa Nacional de Residuos Radiactivos S.A. (Spanish national radioactive waste management agency).
ENSREG:	European Nuclear Safety Regulator Group, formerly the European High Level Group on Nuclear Safety and Waste Management.
Enusa:	Empresa Nacional del Uranio S.A. (Spanish national uranium company).
EPD:	Electronic Personal Dosimeter.
ERCA:	European Radiation Control Authorities.
ERO:	CSN Emergency Response Organisation.
ERSP:	Environmental Radiological Surveillance Programme.
EU:	European Union.
Euratom:	European Atomic Energy Community.
FER:	Federación Española de la Recuperación y el Reciclaje (Spanish recovery and recycling federation).
FISALUD:	International health fair.
FORO:	Latin American Forum of Radiological and Nuclear Regulatory Organisations.
FTX:	Field Training Exercise.
GL:	NRC Generic Letter.

Greenpeace:	Non-governmental organisation for the protection and conservation of the environment and peace.
GS:	CSN Safety Guide.
I-131:	Iodine 131.
IAEA:	International Atomic Energy Agency.
IGAE:	Intervención General de la Administración del Estado (General State Administration Supervisory Board).
INES:	International Nuclear Events Scale.
INRA:	International Nuclear Regulators Association.
IRP:	CSN Incident Review Panel.
IRRS:	Integrated Regulatory Review Service.
IS:	Nuclear Safety Council Instruction.
ISCIII:	Carlos III Institute of Health.
ISO:	International Standardization Organization.
ITS:	Individual Temporary Storage.
LAECSP:	Law on Electronic Access to Public Services.
LDL:	Lower Detection Limit.
MUE:	Military Unit for Emergencies.
MW:	Megawatt.
N/A:	Not applicable.
NEA:	Nuclear Energy Agency of the Organisation for Economic Cooperation and Development.
NF:	Nuclear facility.
NPP:	Nuclear Power Plant.
NRBC:	Nuclear, Radiological, Biological and Chemical.
NRC:	Nuclear Regulatory Commission.
OECD:	Organisation for Economic Cooperation and Development.
PAMGS:	Action plan for improved safety management at Vandellós II nuclear power plant.
PDS:	Personal Dosimetry Service.
Penta:	Plan de Emergencia Nuclear de Tarragona (Nuclear Emergency Plan of Tarragona).
Penva:	Plan de Emergencia Nuclear de Valencia (Nuclear Emergency Plan of Valencia).
PIMIC:	Plan Integrado de Mejora de las Instalaciones del Ciemat (Integrated Plan for Improvement of the Ciemat Installations).
Procura:	Plan de Refuerzo Organizativo, Cultural y Técnico de la Asociación Nuclear Ascó-Vandellós (Organisational, cultural and technical reinforcement plan of the Asociación Nuclear Ascó-Vandellós II A.I.E.).
PSA:	Probabilistic Safety Assessment.
Pvrain:	Programa de Vigilancia Radiológica Ambiental Independiente (Independent Environmental Radiological Surveillance Programme).
PWR:	Pressurised Water Reactor.
RD:	Royal Decree.
R&D:	Research and Development.
RER:	Reportable Event Report.
RF:	Radioactive facility.
RIC:	NRC Regulatory Information Conference.
RNRF:	Regulation on Nuclear and Radioactive Facilities.
RPHIR:	Regulation on the Protection of Health against Ionising Radiations.
RPS:	Radiological Protection Service.

RPTU:	Radiological Protection Technical Unit.
S.A.:	Sociedad Anónima (Limited Company).
Salem:	CSN Emergency Room.
SAU:	Sociedad Anónima Unipersonal (Single part limited company).
SEP:	Site Emergency Plan.
SISC:	Sistema Integrado de Supervisión de Centrales Nucleares (CSN integrated nuclear power plant supervision system).
SSN:	Sampling Stations Network.
SVEA:	Design of nuclear fuel for boiling water reactors, manufactured by ABB.
Unesa:	Asociación Española de la Industria Eléctrica (Spanish electricity industry association).
UNESID:	Unión de Empresas Siderúrgicas (Union of iron and steel companies).
UAM:	Andújar Uranium Mill.
WENRA:	Western European Nuclear Regulators Association.

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