

# CSN

ANNUAL REPORT 2010



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# Introduction

The Spanish Nuclear Safety Council (CSN) submits the 2010 annual report on the activities performed throughout the year. For another year we want to provide the society with a detailed summary of the actions carried out in the fields of nuclear safety and radiological protection, included to a large extent in the Annual Report submitted to the Parliament.

For the CSN, 2010 has been a significant year. On the one hand, it has been witness to the 30<sup>th</sup> anniversary of this institution, which for three decades has performed its task as an independent regulatory body, gaining both national and international recognition and prestige. Besides the 30<sup>th</sup> anniversary celebrations, it also meant the beginning of a renewal phase marked by the implementation of the new CSN Statute approved by the Spanish Council of Ministers on 5<sup>th</sup> November 2010.

This new regulation modifies Law 15/1980 on the Creation of the CSN, published at the end of 2007, and sets forth a series of new internal developments: changes in its structure as well as in some legal, economic, management and resources aspects. However, the most substantial and momentous change has probably been the consideration of increasing social awareness by improving transparency, participation and reinforcing the public's right to access information and to social involvement.

In order to ensure the performance of these functions, the new Statute contemplates the creation of an Advisory Committee for Public Information and Participation on nuclear safety and radiological protection. A committee with broad institutional representation composed by public administrations, social, entrepreneurial and environmental organisations, as well as specialised experts, which task will be to make recommendations and suggestions to the CSN in order to improve its transparency.

Besides the institutional changes, the Council has continued with its functions of supervising and controlling the nuclear and radioactive facilities of Spain. Among the many actions carried



out throughout 2010, which this memory provides information about, it was particularly relevant the incorporation of aspects related to security and culture safety to the Integrated Nuclear Power Plant Supervision System (SISC), a basic tool that evaluates how nuclear power plants operate.

In 2010 the Epidemiological Study on which the Carlos III Institute of Health (ISCIII) and the CSN worked together during four years ended. A research carried out to analyze the possible ionizing radiations effects on the health of the population residing in the vicinity of the nuclear facilities. The aforementioned study that was submitted to the Ministry of Health, Social Policy and Equality, dismissed the possible harmful effects of the ionizing radiations on the health of the population residing in the surrounding area of the nuclear facilities.

Within the framework of institutional collaboration, executed in order to improve emergency response, the CSN and other public entities have signed the *Action protocol in the event of detecting inadvertent movement or illicit trafficking of radioactive materials in ports of general interest*. The aforementioned protocol establishes the functions and procedures each agency must follow in the case of finding container with a nuclear material in a Spanish port.

Throughout the following pages of this report, the readers can understand the details of these actions and also a synthesis of the work carried out during the year, which has been explained at length in the Annual Report submitted to the Congress of Deputies and the Senate.

The Spanish Nuclear Safety Council information is displayed for everyone interested in our website **[www.csn.es](http://www.csn.es)**.



CHAPTER

# 01

## The Spanish Nuclear Safety Council

## The Spanish Nuclear Safety Council

The Spanish Nuclear Safety Council (CSN) was created in 1980 with the task of providing the workers, the population and the environment with a protection framework from the harmful effects that the activities of nuclear and radioactive facilities in Spain could generate.

While these facilities can work in different fields for the benefit of human beings, i.e. medicine, power generation, industry and research, it can pose some risks related to ionising radiations.

In order to avoid these risks, the CSN works to achieve a situation where nuclear and radioactive facilities work under safety standards and dispose of all the preventive and compensatory measures to face nuclear and radioactive emergencies, as well as detecting and overseeing the presence of radioactive elements in the environment.

Being an independent organisation and promoting transparency are two intrinsic values part of the nature of the institution, reinforced by the reforms to the 2007 Law by which it was created and ratified by its new Statute, which was approved by the Spanish Council of Ministers in November 2010.

As an independent regulatory body, the CSN has legal personality and its own assets. It reports only directly to the Parliament and it is not subject to the hierarchy or guardianship of the Public Administration or the State, or any other organisation or company linked to its activity.



As for its internal organisation, the CSN is led by the Board of Commissioners of the Council, constituted by the President, the Vice President and three Commissioners elected by the Parliament for a six-year period.

In the performance of its functions, the Board of Commissioners is assisted by a Secretariat General which the administrative and legal bodies as well as the Nuclear Safety and Radiological Protection divisions report to.

In order to perform its functions, the CSN has a multidisciplinary and highly qualified team of people composed of over 450 workers, experts in nuclear technology, radiological protection and environmental surveillance and control. A professional team with a vocation for public service that makes the CSN the renowned agency it is and ensures the accomplishment of its functions in an effective, efficient, transparent and neutral manner.





The CSN's promotion of transparency and commitment towards society are reinforced in its new Statute with the creation of the Advisory Committee for Public Information and Participation on nuclear safety and radiological protection. This Committee is composed by a broad range of institutional delegations, which must be able to issue recommendations to the CSN in order to guarantee and improve transparency, in addition to promote the necessary measures to stimulate the public's access to information and participation in relation to issues for which the Council is the competent body. After the preparations for the implementation of the Advisory Committee by the end of the year 2010, its inaugural meeting was held in February 2011.



# 30

CONSEJO DE  
SEGURIDAD NUCLEAR  
ANIVERSARIO

On an international scale, the CSN is the official representative of Spain before the institutions of its sphere and as such, throughout 2010 it has promoted the Spanish Presidency of the European Union and it has been part of the elaboration of a draft on the future European Directive for the responsible management of spent fuel and radioactive waste.

## 30<sup>th</sup> Anniversary

In the year 2010, the CSN had been active with its work and providing its service towards society for 30 years. A phase marked by plurality, independence and scientific rigour, three pillars of this institution that allowed it to strengthen its national and international leadership in two technical fields as complex as nuclear safety and radiological protection.

The anniversary was celebrated on 28<sup>th</sup> June with a workday in the Senate attended by high-profile personalities, among others, the Director General of the International Atomic Energy Agency, Yuyika Amano; the President of the Senate, Javier Rojo; the Vice President of the European Commission and Commissioner responsible for Competition, Joaquín Almunia; and the Minister of Industry, Tourism and Trade, Miguel Sebastián, as well as Presidents and Representatives of the regulatory bodies from other countries and of the Spanish electric power industry. The former presidents of the CSN were paid tribute, during the ceremony.

Furthermore, on the occasion of this anniversary, on July 1<sup>st</sup>, His Majesty the King Don Juan Carlos I had an audience with the Board of Commissioners of the Nuclear Safety Council and its four former presidents Francisco Pascual Martínez, Donato Fuejo Lago, Juan Manuel Kindelán Gómez de Bonilla and María-Teresa Estevan Bolea.



## CSN Functions

- Propose necessary regulations to the government and draw up and approve nuclear safety and radiological protection standards.

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- Issue reports to the Ministry of Industry, Tourism and Trade, so facilities can be authorized and concentrations or activity levels of the materials that contain or include radioactive substances can be considered radioactive waste.

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- Undertake inspections and control the operation of facilities.

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- Propose sanctions proceedings to the extent of its competence.

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- Collaborate with the competent authorities in emergency and security plans.

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- Control the radiological protection measures for exposed workers, the public and the environment.

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- Collaborate in programmes for the radiological protection of persons subjected to diagnosis or treatment procedures using ionising radiations.

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- Grant and revoke, when necessary, the authorisations corresponding to the entities or companies that provide radiological protection services and carry out inspections and controls of its facilities.

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- Grant and renew operating licenses.

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- Undertake studies, assessments or inspections throughout the whole radioactive waste management process.

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- Advise the Courts and bodies of the public administration about nuclear safety and radiological protection.

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- Maintain official relationships with overseas bodies and collaboration in compliance with the commitments undertaken by Spain in relation to safeguards.

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- Establish and track research plans relating to nuclear safety and radiological protection.

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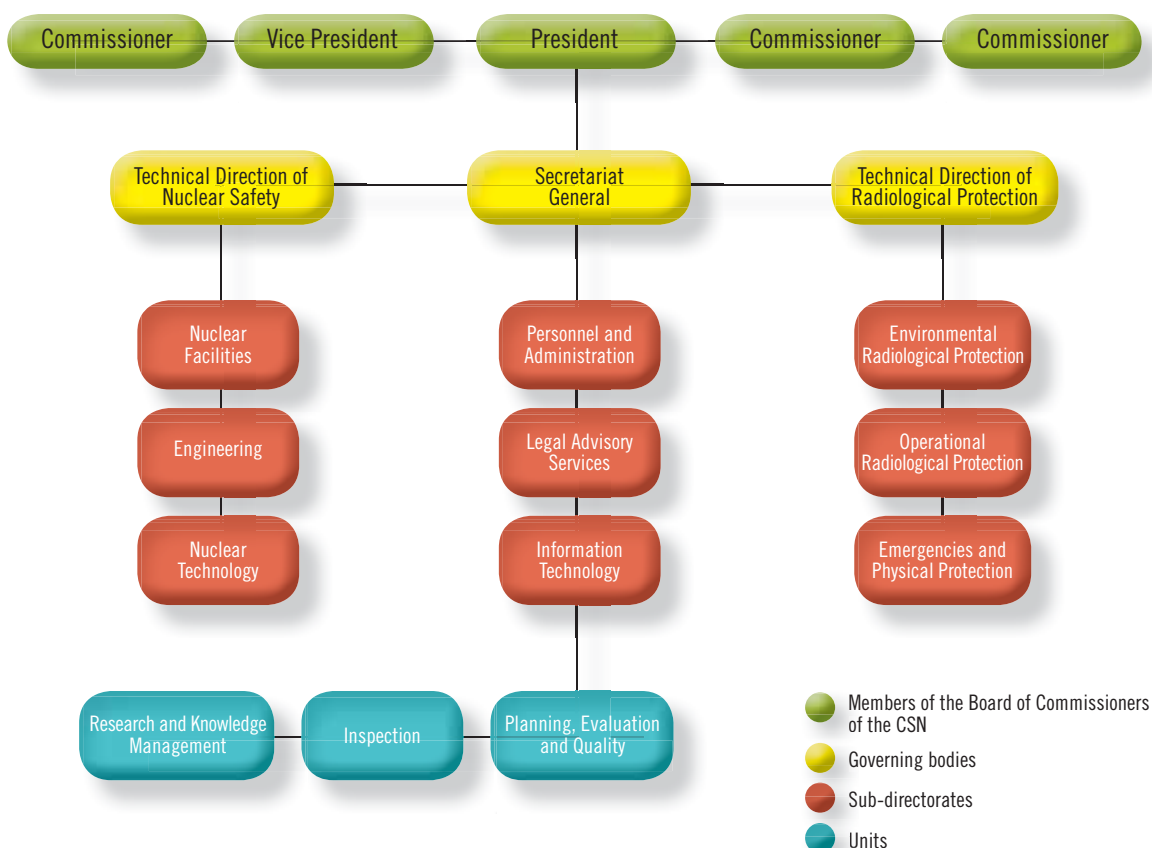
- Inform public opinion and the national, regional and local authorities.

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## Legal standards, approved in 2010, related with the CSN actions

- Law 6/2010, of 24<sup>th</sup> March, modifying the amended text of the Law on Environmental Impact Assessment of projects, approved by the Royal Legislative Decree 1/2008.
- Royal Decree 1439/2010, of 5<sup>th</sup> November, modifying the Regulation on Health Protection against Ionising Radiations, approved by the Royal Decree 783/2001, of 6<sup>th</sup> July.
- Royal Decree 1440/2010, of 5<sup>th</sup> November, approving the Statute of the Nuclear Safety Council.
- Royal Decree 1564/2010, of 19<sup>th</sup> November, approving the Basic Directive on the Planning of Civil Defence against Radiological Risks.

## CSN Organisation Chart







CHAPTER

# 02

## Monitoring and control of facilities

## Nuclear Power Plants

Of all the electricity in Spain, 20% is generated by the six nuclear power plants in operation: Almaraz, Ascó, Cofrentes, Santa María de Garoña, Trillo and Vandellós. Two of them, Almaraz and Ascó, have twin units, which makes a total number of eight reactors.

### Location of the nuclear power plants in the map of Spain



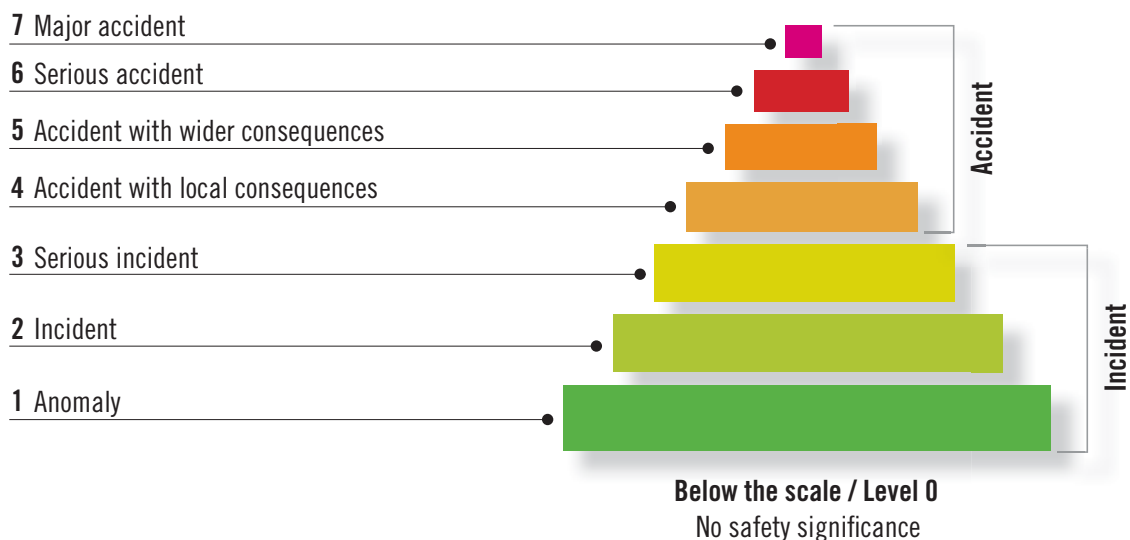
In order to verify that these facilities are in compliance with the safety standards, the CSN follows the Integrated Plant Supervision System (SISC), which enables to obtain information about the performance of the plants and about the evaluation and control that the CSN itself has undertaken. Moreover, this system facilitates the verification of other aspects such as reported events, radiological impact, the dosimetry control of exposed workers, relevant modifications proposed, warnings and sanctions as well as operating events.

From the evaluation of these aspects, it can be asserted that throughout 2010 the performance of the plants was correct within the safety limits. There were only some deficiencies in the Ascó I and II and Cofrentes power plants which were resolved after taking regulatory actions that were additional to those planned.

It is worth stressing that during the year 2010, there were aspects related to security and safety culture that were added to the SISC and that will be implanted throughout 2011 in a pilot phase to improve the program's efficiency.

In the event of an incident, the licensee of the nuclear power plant has the obligation to notify the Council so it can immediately initiate the adequate response, considering the nature of the event, and to classify the incident on the International Nuclear and Radiological Events Scale (INES). This scale contemplates eight degrees (ranging from 0 «no safety significance» to 7 «major accident») and it is used to notify the public and the media about the importance of these events that occur in the nuclear power plants.

































### General description of INES scale levels




During 2010, the Spanish nuclear power plants reported 66 events. Of the total, 98% were deviating operations which were insignificant for safety on the INES Scale. There was only one event classified as level 1 on that scale (anomaly) and it occurred on May 12<sup>th</sup> at the Cofrentes nuclear power plant, due to the infringement of a surveillance requirement in the liquid control system reserve.

In the course of the year, no finding of the SISC inspection had a classification higher than *green* and the indicators that were surpassed this classification were one classified as *white* at the Cofrentes nuclear power plant and two others classified as *white* at Ascó I.





### Action matrix status. SISC 2010

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

#### Unacceptable operation

 Unacceptable risk: situation involving an unacceptable risk that prevents the plant from operating for safety reasons.

#### Acceptable operation

-  Multiple degradations
-  Degraded pillar
-  Regulatory response
-  Licensee response

} Situations involving anomalies, with an increasing need for reinforced inspection and deficiency correction programmes.

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

The public can stay informed about the safety status of each nuclear installation by visiting the direct link to the SISC that appears in the CSN website ([www.csn.es/sisc/index.do](http://www.csn.es/sisc/index.do)). It includes the quarterly system's results explained in a simplified and clear manner.

In order to fulfill its task of control and surveillance, the CSN proposed the Ministry of Industry, Tourism and Trade sanctions proceedings for the Cofrentes I and Vandellós II nuclear powerplants and warnings to Santa María de Garofía and Ascó.





The Council issued 48 permits or favourable reports requested by the nuclear power plants. These include renewal authorisations granted for a ten-year period to the units of Almaraz and the Vandellós II power plant.

Technical studies also began to update the operating permits for the Cofrentes and Ascó nuclear power plants which expire in 2011. A favourable report was issued on 8% increase of power at the Almaraz II nuclear power plant as well, and a favourable report for the power increase test results at Almaraz I.

The hard inspection work carried out by the CSN, makes it possible to permanently trace the journey and safety control of the nuclear facilities. With the Basic Inspection Programme (PBI), the systematic work of the resident inspectors and specific inspections conducted by the institution's experts are both overseen.

In 2010, 167 inspections were performed, of which 99 were conducted within the PBI. The other were complementary inspections carried out due to indicators or findings from the SISC

inspection, events and incidents, as a result of new standards, among other reasons. For example, in order to issue the reports leading up to the authorisations for renewal of the Almaraz and Vandellós II plants operation, a variety of inspections were performed; another example was the inspection on the test programme that was carried out to authorise the thermal power increase at the Almaraz II plant.

The nuclear power plants safety improvement requires periodic safety review programmes and generic issues which may affect other plants to adopt corrective measures in the latter case.

Concerning the periodic safety review programmes, in the course of 2010 at Almaraz and Vandellós II, the evaluation of the safety supervision concluded, performed because of the request for renewal of the operating permits, while the same evaluation for Cofrentes and Ascó continued for renewal of their own operating permits planned for March and October 2011.

The review of generic aspects made possible the detection of corrosion in hold-down bolts in the refuelling water storage tank, part of the Ascó unit II and faults in safety valves blowdown in Almaraz, among other deficiencies that were detected by the CSN in order to address to them properly.

In parallel to the actions addressed to detect safety failures attributable to material equipment, the CSN has programmes to evaluate the human and organisational factors. In 2010, the aforementioned programmes were implemented

in the Almaraz, Trillo, Ascó and Vandellós II plants.

At Vandellós II, the Action Plan for Safety Management Improvement (PAMGS) was completed after evaluating the improvements: it was stated that there were 36 major improvements, 19 were related to the organisation and management and 17 were related to the facilities' physical modifications.

At Ascó, the CSN issued its favourable approval to the two revisions of the Plan for the Organisational, Cultural and Technical Reinforcement Plan (Procura) of the Ascó-Vandellós Nuclear Association. In addition, there were inspections conducted to oversee the recommendations that were considered in the previous diagnosis. This plan was launched as a consequence of the emission of radioactive particles notified in April 2008, following its review and the incorporation of improvements imposed by the CSN.





Facing the following five years, the CSN has requested the plant licensees to update the reports and forecasts presented in 2009 and to adapt them to the 2011-2015 period. These reports contain the improvement plans and the

investments contemplated for the maintenance and safety reinforcement, including technology updating, installation maintenance, organisational improvements, staff training, the operating experience analysis, equipment renewal and staffing.

## Radioactive facilities

Radioactive facilities is a term applied to a business, a laboratory or a factory where radioactive materials are handled, stored or produced; devices that produce ionizing radiation and generally any kind of facility containing a source of ionizing radiation. The CSN grants licences and undertakes inspections and controls, either directly or in association with the autonomous communities according to the assignment agreements in place.

### Evolution of the number of radioactive facilities

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



During 2010, the operation of these facilities was developed within the safety standards and in compliance with the necessary measures for the radiological protection of both people and the environment. Throughout the year, the CSN issued 365 reports regarding licensing, 52 of which were authorised to operate, 41 on the declaration of decommissioning and 271 for the authorisation of various modifications. There were 1,815 inspections in radioactive facilities, 776 were performed by the CSN personnel and 1,039 by personnel certified by the CSN, assigned to the autonomous communities. The inspections were divided as follows: 103 inspections were related to licensing, 1,883 to the control of radioactive facilities, 304 to the control of radiodiagnosis installations and 25 to incidents, claims or irregularities.

Besides the inspections, the control of these facilities rests on the review of periodic reports. In 2010, the institution received 821 annual reports from radioactive facilities and around 23,000 from diagnosis X-ray installations, along with 259 quarterly commercialisation reports.

The number of incidents rose to 21, six attributable to operating faults, six to equipment failures, seven to theft or loss of equipment and two to fires at the facility or in its vicinity. With regard to sanctions and warnings, the CSN proposed the initiation of five sanctions proceedings and 103 warnings. Usually, the reasons for which sanctions are made are the performance of activities without authorisation, the operation of facilities by



non-licensed personnel and the non compliance with the instructions and requirements in force. The CSN issued 40 out of the total number of warnings (103), 28 were issued by the autonomous community of Catalonia, two by the autonomous community of Balearic Islands and 33 by the autonomous community of Basque Country.

Being a regulatory body, the CSN has continued sending circulars and technical instructions to the radioactive facilities licensees with explanations and interpretations of the legal standards and promoting good practice. It has also sent seven informative circulars and a technical guideline on improved management of dosimetry in hospitals.



In 2010 the INES Scale continued being applied at a test stage for the classification of events in radioactive facilities, 21 events were classified during the 12 months of the year.

The Permanent Forum on Radiological Protection in the Healthcare Environment, in which the CSN takes part, completed a paper on the criteria to discharge patients and radiological protection measures after receiving iodine-131 treatment.

Finally, the CSN's Instruction IS-28 was published to simplify the licensing of radioactive facilities. This Instruction contains and standardizes the technical specifications applicable to different types of radioactive facilities.





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

In Spain, the Juzbado (Salamanca) fuel assembly manufacturing facility, the El Cabril waste disposal facility (Córdoba) and the Centre for Energy-Related, Environmental and Technological Research (Ciemat) are considered within this framework. The CSN reports, throughout 2010, concluded that all these facilities operated within the established safety criteria.

The CSN issued 12 authorisation reports or favourable approvals in response to these installations' requests. Attention should be drawn to the authorisation granted to the Juzbado factory to increase its enriched uranium storage capacity and its fuel production from 400 to 500 tons. It is also worth mentioning the approval of the revision of the Operating Regulations, the Physical Protection and Internal Emergency Plans, the Quality Management Manual, the Operating Technical and Radiological Protection Specifications and Juzbado's Safety Study.

Continuing with the development of control programmes, the Council conducted 39 inspections, 17 of which were undertaken at the Juzbado factory, 12 at the El Cabril facility and 10 at Ciemat. There were six reportable events in Juzbado, classified as level 0 on the INES Scale, which did not represent a risk for the workers, the population or the environment. El Cabril reported another six events that did not pose a risk either. However, this facility received a warning since compliance with the storage

standards of the official operating document was not ensured.

The Integrated Plan for Improvement of the Ciemat Facilities (PIMIC) continues being executed, a plan that includes dismantling and rehabilitation activities in different areas and buildings. In the framework of this project, the characterisation of the parameters and foundation slabs of laboratories for radioactive standards and the analysis of enriched uranium solutions was concluded. Moreover, the decontamination works were finished in the area known as La Lenteja.





## Facilities in the decommissioning, dismantling and shutdown stage

Every activity carried out in each of the facilities in the shut down, dismantling and decommissioning phases during 2010, was performed within the safety parameters established, without any negative impact on people or the environment

As for licensing activities, the CSN issued three reports in relation to authorisations or favourable assessments, the most important of which were the dismantling authorisation

of the José Cabrera nuclear power plant and the extension of the suspension period of the licence for dismantling granted to the Quercus plant until the end of 2011.

Following its control programme, the CSN carried out a total of 26 inspections, 5 at the Vandellós I power plant, 13 at the José Cabrera plant, 3 at the Quercus plant, 2 at the Elefante plant and 3 at the Andújar Uranium Mill (FUA).

### Installations in the definitive shutdown, dismantling and decommissioning phase

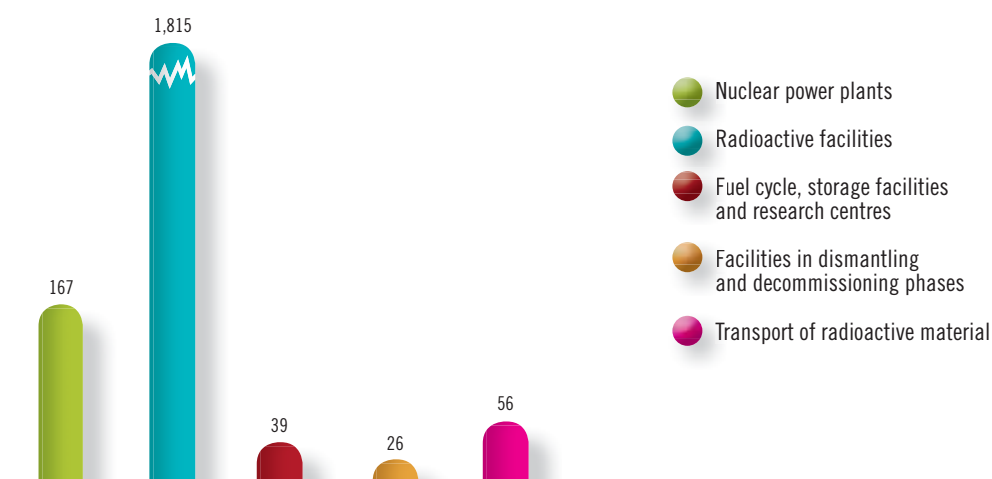
Installation	Status
Vandellós I nuclear power plant	Latency after the conclusion of the first dismantling phase
José Cabrera nuclear power plant	Dismantling (O. M. of 1 <sup>st</sup> February, 2010)
Elefante uranium concentrates plant	Dismantling and surveillance
Quercus plant	Shutdown
Andújar Uranium Mill (FUA)	Decommissioning on the execution period



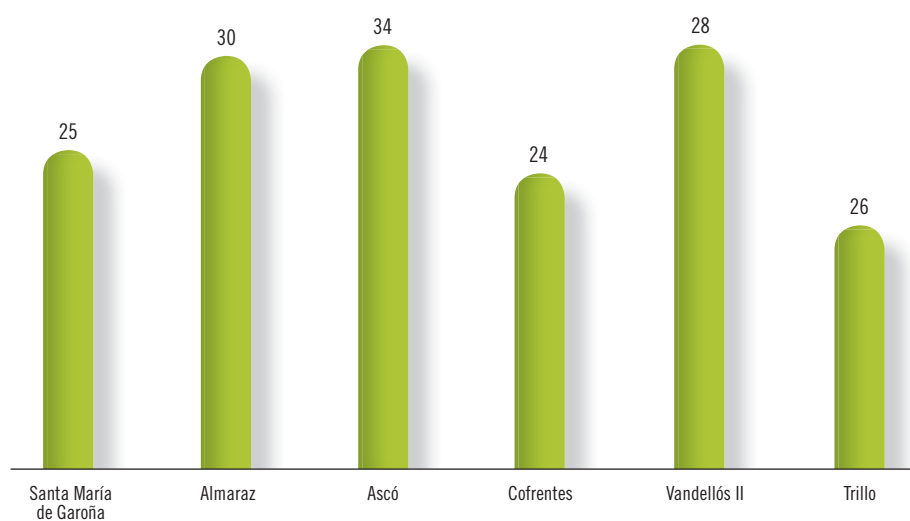
Among the reportable events, on 1<sup>st</sup> September 2010, an incident in the Quercus plant was reported related to a breakdown of two fire extinguishing system detectors, which did not have any radiological consequences or impact on the plant.

At all these facilities, the programmes for environmental radiological surveillance, worker radiological protection, physical protection, releases monitoring and radioactive waste management remained operative. At Vandellós I, the five-year watertightness test conducted on the reactor pile was successfully executed.

### Number of inspections performed by the CSN in 2010



### Distribution of the inspections performed at nuclear power plants



## Transport of nuclear and radioactive material

In Spain, radioactive material transportation is regulated by international standards based on the Security in the Transport of Radioactive Material of the International Atomic Energy Agency (IAEA). The Spanish Nuclear Safety Council is responsible for verifying compliance with these regulations, issuing safety reports to the Ministry of Industry, Tourism and Trade that are crucial to receive authorisations to transport certain type of radioactive materials. Furthermore, the CSN is in charge of verifying that the packaging and vehicles fulfill the national and international standards. The CSN together with the autonomous communities collaborate in this task with which the CSN has function assignment agreements.

In 2010, the CSN reported the following licensing sanctions proceedings: six validations of approval certificates of foreign packages and four transport authorisations under special arrangement. There were also 56 inspections

in relation to the transport of radioactive and nuclear materials, 23 performed by the CSN itself and 33 by the autonomous communities. This task was completed with the analysis of the preliminary notifications and performance reports required by the CSN for the shipment of fissile materials and high level radioactive sources and wastes. Throughout the year, 74 such reports were analysed in relation to fissile material shipments and 218 on radioactive waste transport operations carried out by Enresa, 186 from nuclear facilities and 32 from other installations.

In 2010, five incidents were recorded during the transport of the radioactive material: 3 road accidents that affected the transport of material for medical use, one due to the mislaying of a package in Barajas airport (which was finally found intact) and the last one was due to a theft of equipment that was recovered later.



## Personnel licences

The personnel whose task is to supervise and operate radioactive facilities requires a licence granted by the CSN to certify their specialised training. This licence must be renewed periodically.

At the end of 2010, the total number of licenced workers was 13,745: 4,018 had supervisor licences, 9,457 had operator licences and 180 Radiological Protection Service Head diplomas. Moreover, 43,020 workers were accredited to manage medical radiodiagnosis facilities and 59,402 to operate them.

Throughout the same period, the CSN issued 15 supervisor licences, 12 operator licences, two for the Heads of Radiological Protection Service and 37 supervisor licences and 30 operator licences were extended, all of them at nuclear power plants.

In fuel cycle, storage and dismantling facilities, five supervisor licences, four operator licences and one Radiological Protection Service Head licence were issued. There were also 10 supervisor licences and 29 operator licences were extended.

At radioactive facilities, 433 new supervisor licences, 1,158 operator licences and 10 Radiological Protection Service Head licences were issued. Also 434 supervisor licences and 961 operator licences were extended.

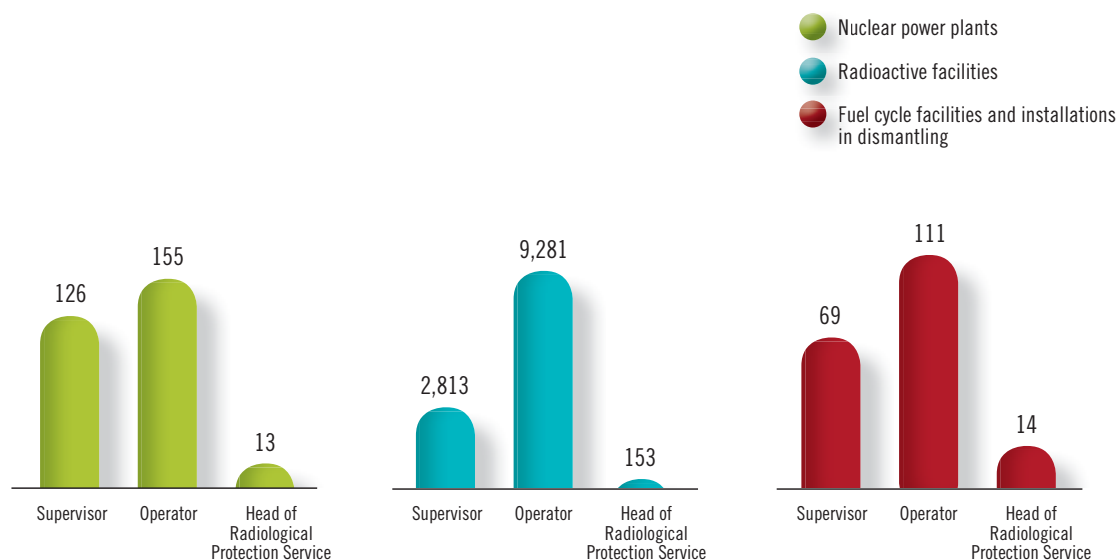
At medical radiodiagnosis facilities, 1,660 credentials were issued to the management such installations and 1,752 for their operation.

The CSN approved three new courses to obtain licences and credentials required at radioactive facilities and authorised the modification of one previously approved, along with four new courses for the grant of credentials to personnel of X-ray facilities. The control of courses given and their corresponding exams gave rise to 56 inspections.

The materials for the delivery of the courses aimed at obtaining licences and credentials, in all the applicable fields of the radioactive and radiodiagnosis facilities are readily available in the CSN website.



## Number of personnel licences as of 31<sup>st</sup> December 2010



## Service entities

This section includes companies that provide services in relation to radiological protection. Among these services are the Radiological Protection Services (SPR), the Radiological Protection Technical Units (UTPR), companies selling medical X-ray equipment and providing technical assistance, Personal Dosimetry Services (SDP) and registered external companies. All of these are subject to licensing and control by the CSN.

At the end of 2010, there were 76 SPRs and 48 UTPRs authorised by the Council. Four new services and a new UTPR were authorised. There were 29 inspections performed on the SPRs and 24 on the UTPRs. As a result of inspection, a new sanction proceeding against a UTPR was proposed. The inspection was carried out with the collaboration of the autonomous communities with which function assignment agreements have been signed.

The Spanish Radiological Protection Society-CSN Forum continued its activities. In 2010, the working group on the type of contract of the UTPR for the provision of services concluded. Two new groups were created, one to define the standard compliance certificate of the X-ray facilities of healthcare centres, and another one to establish a radiological protection programme applicable to dental clinics with intraoral imaging systems.

When it comes to sales and technical assistance companies, the CSN reported on the authorisation of 16 new companies, the modification of the authorisations of four and the closing of one. At the end of 2010, 310 entities had this authorisation.

Following with the control programme which includes the 30 authorised dosimetry services, 21 external and 9 internal, 11 inspections were carried out throughout the year.

As for the registered external companies, during the year, 72 new companies registered in the External Companies Register, which means that on 31<sup>st</sup> December a total number of 1,441 registered companies was reached. Mostly there were companies whose activity was related to nuclear power plants.



## Other licensing and control activities

Among the many CSN licensing functions, it has to authorise the manufacturing of radioactive equipment and grant + approvals for equipment that incorporates radioactive substances.

As of 31<sup>st</sup> December 2010, there were 47 companies authorised for the activities contemplated in section VII of the Rules for Nuclear and Radioactive Facilities regarding the addition of radioactive substances in the production of consumer goods, the import, export, commercialisation and transfer of radioactive materials, radiation-generation equipment and consumer goods. During 2010, 12 new authorisations were drawn up for the performance of these activities and modifications

of the authorisations of 15 companies which had already been authorised before were approved.

On the other hand, within the framework of application of the *Protocol on collaboration in the radiological surveillance of metallic materials*, the CSN was informed on 100 occasions of the detection of radioactivity in metallic materials. The radioactive sources, which included indicators with radioluminescent paint, ion smoke detectors, radioactive lightning rods, products containing radium and thorium and contaminated parts, among others, were transferred to Enresa for management as radioactive waste.

At the end of the year, the number of metallurgical installations registered under the protocol was 150.





CHAPTER

# 03

Radiological  
protection



## Radiological protection of the workers

Given the characteristics of their work, many workers are exposed to ionising radiations. The task of the CSN is to oversee the radiation levels that many people receive in order to ensure these levels are as low as is reasonably achievable and in any case below the regulatory dose thresholds. In this respect, the Council inspects the facilities and checks that all the measures established in the legislation are applied. It also provide assessment of the radiological risk associated with each activity, the radiological classification and surveillance of the workers and workplaces, the supply of adequate information and training and medical surveillance.

The Regulation on the Protection of Health against Ionising Radiations, updated in 2010, establishes that the dosimetry histories of the exposed workers should be recorded and maintained in the National Dosimetry Bank (BDN), the basic tool available to the CSN for overseeing and controlling the doses of the workers. As of closure of the year 2010, there were 16,771,437 dosimetry measurements registered in the National Dosimetry Bank, corresponding to 295,796 workers and 53,293 facilities.

During this year, the number of dosimetrically controlled workers exposed to ionising radiations amounted to 103,934. The collective dose corresponding to the workers overall was 22,308 mSv.person. If only the significant doses are taken into account and the potential cases of the annual dose limit are excluded,

the average individual dose of the workers was 0.72mSv/year.



Of these workers, 99.36% received doses lower than 6 mSv/year and 99.97% doses lower than 20 mSv/year. These ratios point to the low doses received in Spain's nuclear and radioactive facilities as regards to compliance with the regulatory limits, which in Spain are 100 mSv accumulated over five consecutive years with a limit applicable to professionally exposed workers of 50 mSv/year, current limits in the European Union.



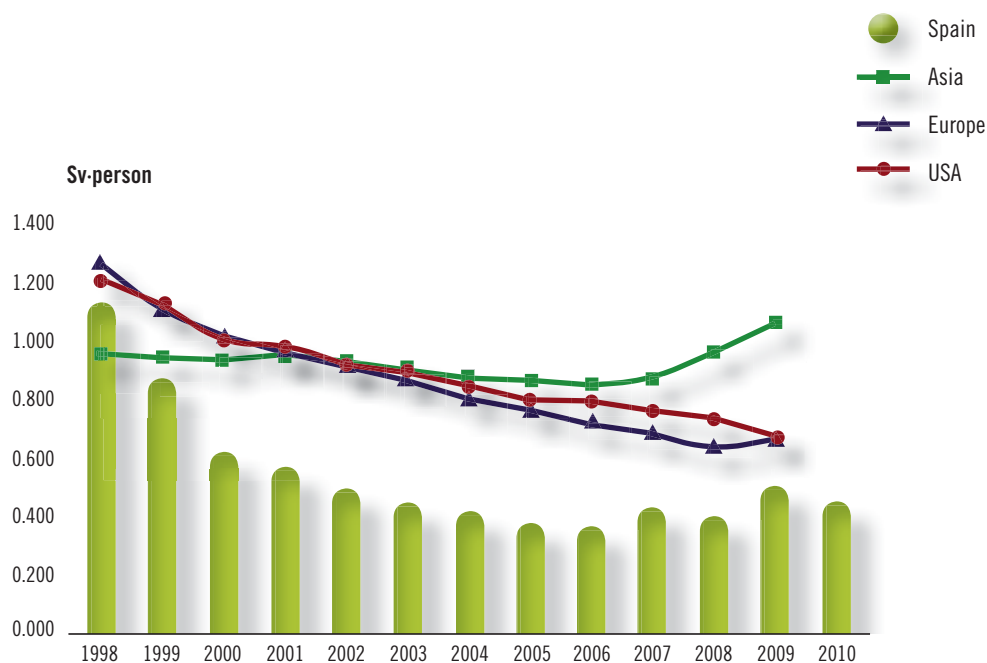


If the data is analysed, it highlights that the greatest contribution to the collective dose of the exposed workers overall is made by the medical radioactive facilities, with 68% of the overall collective dose, since the number of exposed workers represents 79% of the total.

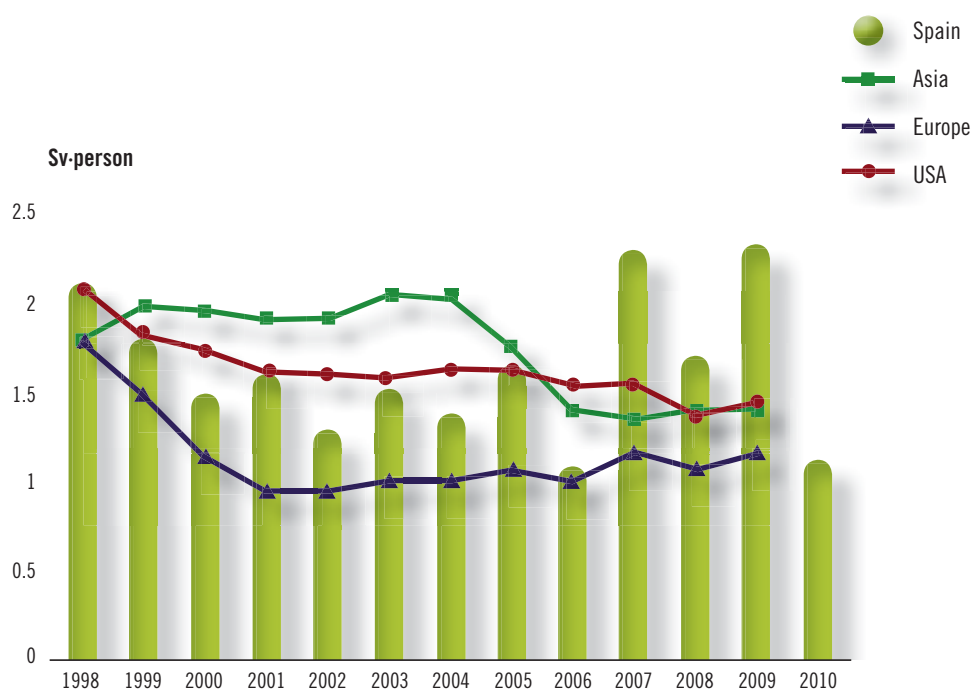
At nuclear power plants, the average individual dose was substantially reduced since last year. As in previous years, the contracted personnel had higher doses than the regular staff, 0.97 mSv/year compared to 0.75 mSv/year; this situation is similar in other countries.

In the 2008-2010 period, in the PWR plants (pressurised water reactors) the average collective dose has slightly decreased, which was similar in the BWR, where these doses are comparable to those recorded in Europe for the 2007-2009 period and was lower than those obtained in the three-year period of 2006-2009 in the U.S.A., which is considered the reference country for the Spanish plants that use this technology.

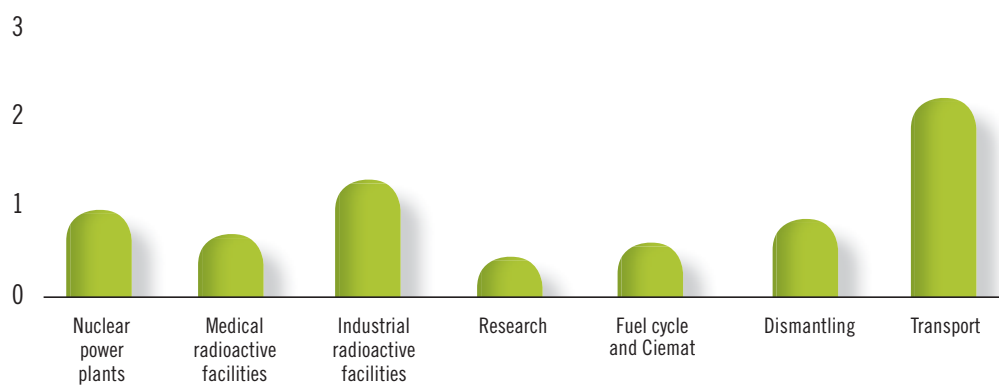
#### Average three-yearly collective dose for PWR type reactors. International comparison



### Average three-yearly collective dose for BWR type reactors. International comparison



### Individual doses by sector (mSv/year)



The highest average individual dose corresponded, like in previous years, to the workers in the transport sector (2.23 mSv/year), and especially to those involved in the transport of radiopharmaceutical products by road. The high

activity levels of the goods handled, the small size of the packages, their loading and unloading by hand and the fact that the supply is carried out by few companies with a small number of workers explain the differences in this sector.

### Doses received by the exposed workers in each of the sectors

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

\* The calculation of average individual dose considers only those workers that have had dosimetry readings higher than background.

During 2010 there were 10 cases of the regulatory annual dose limits for workers being exceeded, every one of them in radioactive facilities. These are being analysed in accordance with the established procedure.

The CSN manages a register in order to control the protection of the external companies' workers

(contracted professionals performing occasional work at the facilities), all the entities performing activities in the controlled zones of nuclear and radioactive facilities and their workers who provide an occasional service have to be included. Their workers are also obliged to possess a radiological work licence. Throughout 2010, the CSN issued 3,986 radiological work licences for workers of 282 companies.

## Environmental radiological surveillance

In order to have a proper radiological protection that can reduce the risks related to the radiation in the environment, the CSN controls and oversees the areas surrounding nuclear facilities and their areas of influence. The aim is to assess the impact of the radiations and to oversee and maintain the quality of the environment. This task is completely fulfilled with the surveillance and control of the radioactive effluents limits, in a liquid or gaseous state, waste of the nuclear facilities.

During 2010, these releases remained within the usual values and are comparable to those of other European and US installations, according to surveillance evidences and the records. As in previous years, the calculated doses attributable to these releases were far below the regulatory dose limits for the public. At the nuclear power plants, this fraction did not exceed 1.9% of the established dose restriction of 100 microSivert/year.

### Liquid and gaseous radioactive effluents from PWR plants. Standardised activity (GBq/GWh). World averages comparison

#### Gaseous effluents

	PWR		BWR	
	Spain <sup>(1)</sup>	Unsear 2008 <sup>(2)</sup>	Spain <sup>(1)</sup>	Unsear 2008 <sup>(2)</sup>
Noble gases	4.66E-1	1.26E+0	2.25E+0	5.02E+0
I-131	1.77E-6	3.42E-5	7.71E-5	6.85E-5
Particles	6.88E-7	3.42E-6	6.60E-4	5.59E-3
Tritium	1.72E-1	2.240E-1	2.21E-1	1.83E-1
C-14	1.60E-02	2.51E-2	4.58E-02	6.05E-2

#### Liquid effluents

	PWR		BWR	
	Spain <sup>(1)</sup>	Unsear 2008 <sup>(2)</sup>	Spain <sup>(1)</sup>	Unsear 2008 <sup>(2)</sup>
Total without tritium	6.48E-4	1.26E-3	5.11E-5	9.13E-4
Tritium	2.93E+0	2.28E+0	1.18E-1	2.05E-1

(1) Average values: 2001-2010. (2) Average values: 1998-2002.

### Fuel cycle facilities and installations in the definitive shutdown, dismantling and decommissioning phase. Activity of liquid and gaseous effluents (Bq). 2010

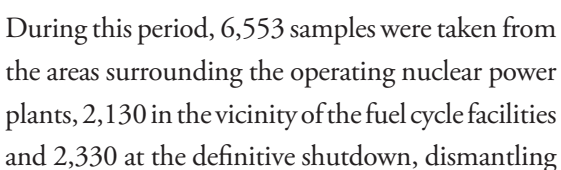
Effluents	Fuel cycle facilities and dismantling phase			Installations in the definitive shutdown		
	Juzbado	El Cabril (1)	Ciemat	Quercus (2)	Vandellós I (3)	José Cabrera
Liquid effluents	2.01 10 <sup>7</sup>		7.69 10 <sup>6</sup>	1,8 10 <sup>7</sup>	Except tritium - Tritium -	1.31 10 <sup>7</sup> 4.65 10 <sup>10</sup>
Gaseous effluents	7.18 10 <sup>4</sup>	Total alpha Total beta Gamma Tritium C-14	5.41 10 <sup>3</sup> 1.39 10 <sup>5</sup> LID 9.06 10 <sup>8</sup> 2.46 10 <sup>8</sup>	LID	Particles Tritium Alpha C-14	7.06 10 <sup>2</sup> LID 2.94 10 <sup>1</sup> 1.21 10 <sup>1</sup> 1.19 10 <sup>6</sup> 2.54 10 <sup>8</sup> LID -
Calculated	0,012% of established dose restriction	3,70% of established dose restriction	<1% of established dose restriction	<1% of established dose restriction		

(1) Zero release facility.

(2) Does not generate gaseous effluents due to activities having ceased.

(3) Emissions due to occasional reactor pile venting and specific characterization

In the surroundings of nuclear facilities, fuel cycle facilities, definitive shutdown facilities, and those undergoing dismantling and decommissioning, the environmental radiological surveillance programmes (PVRA) are applied, developed by its licensees and required by the CSN that also continuously evaluates, undertakes inspections and controls.



The CSN verifies these results by means of independent environmental radiological surveillance programmes (PVRAIN) carried out by university laboratories and autonomous communities. The PVRAIN results for the year 2009 did not show any significant deviation in respect of those of the PVRA.

## CSN atmospheric and terrestrial sampling stations network: dense and open networks

### LABORATORIES

#### 1992

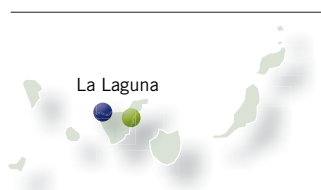
Bilbao: University College of Industrial Engineering and Telecom  
 Santander: University of Cantabria  
 León: University of León  
 Salamanca: University of Salamanca  
 Badajoz: University of Extremadura  
 Cáceres: University of Extremadura  
 Madrid: Polytechnic University of Madrid  
 Seville: University of Seville  
 Málaga: University of Málaga  
 Granada: University of Granada  
 Valencia: University of Valencia Polytechnic  
 University of Valencia  
 P. Mallorca: University of the Balearic Islands  
 Tenerife: University of La Laguna

#### 1997

Ciudad Real: University of Castilla-La Mancha  
 La Coruña: Polytechnic University of La Coruña  
 Oviedo: University College of Mining Engineering  
 Zaragoza: University of Zaragoza

#### 2000

Ciemat  
 Barcelona: Polytechnic University of Catalonia

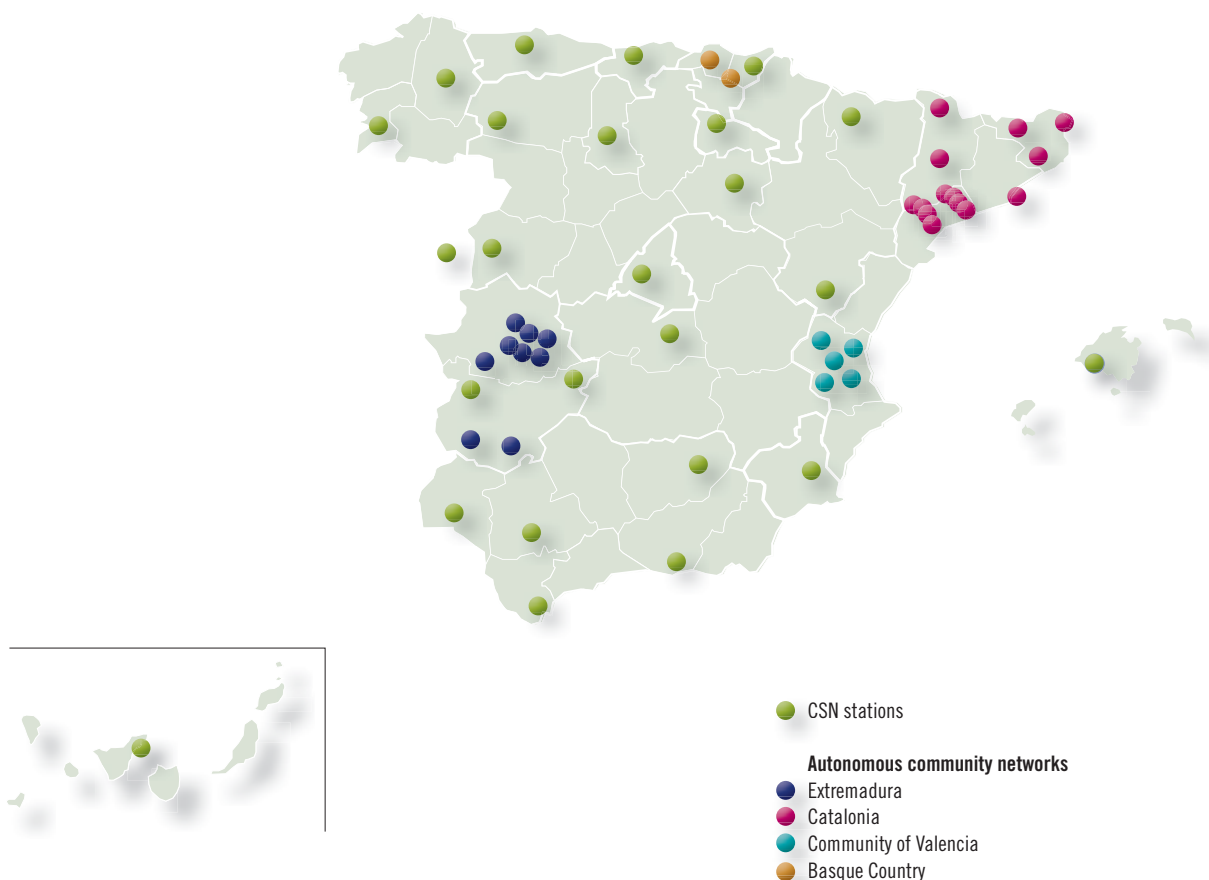


The radiological quality of the entire national territory is overseen through a network of stations managed by the CSN. The Automatic Stations Network (REA) has 25 stations located throughout the country in addition to the networks of Catalonia, Valencia, Extremadura and Basque Country which are 18 stations located in their own territories. Its mission is the uninterrupted measuring of the gamma dose

rate, the concentration of radon, radioiodines and alpha and beta emitters in the air.

The Sampling Station Network (REM), made up of 20 laboratories that analyse samples of river and coastal waters, the atmosphere, the land and foodstuffs. The values obtained by this network in 2010 are similar to those of previous years and show a correct radiological status.

### Spanish environmental radiological surveillance network (Revira). Automatic Stations Network (REA)



There are other environmental radiological surveillance programmes related to cases of long-time exposure due to old procedures or accidental situations of the past, and their control depends on the competent authority with the favourable assessment. One of these programmes was performed in the Lobo-G uranium concentrates manufacturing plant in Badajoz, which was decommissioned in 2004; this programme consisted in the collection and analysis of 50 samples in 2009. The results obtained did not show a significant radiological incident that affected the population. During

2010, the CSN verified the compliance with the conditions of the declaration of decommissioning and the performance of a surveillance programme with two inspections.

It continued with the radiological surveillance programme in the Palomares area in Almería, where in 1966 there was an accident that caused the dispersion of plutonium. The results of the programme indicate that the aforementioned incident has not had any negative impact on the health of Palomares' inhabitants.





The consecutive actions of the Government, reported by the CSN, led to land expropriations, temporary occupation of some of them and restrictions of use in certain lands in order to face the rehabilitation of the area.

Ciemat presented, in 2010, on the basis of the threedimensional radiological characterisation study finished in 2009 the *Rehabilitation plan*. The *Preliminary proposal* was favourably assessed by the CSN, with the definitive Rehabilitation Plan pending devaluation.

In April 2010, the European Union made a verification mission to this area, in the framework of article 35 of the Euratom Treaty, where it became evident that the radiological studies performed, the surveillance programmes put in place and restrictions applied were adequate and followed the requirements of the aforementioned article of the Euratom Treaty.

Furthermore, as for the control of the natural radiation exposure, in 2010 the CSN published a study on the titanium industry made in

collaboration with the Universities of Seville and Huelva and a new agreement with the University of the Basque Country for the study of the radiological risks in arc welding. The *Safety Guide GS-11.01, Guideline on the laboratories' competence and the services to measure radon in air* was also published.

In the radiological protection field, it is worth mentioning the completion of the Epidemiological Study that was requested by the Congress of Deputies and carried out by the Carlos III Institute of Health in collaboration with the CSN. It deals with the possible impact of ionising radiations on the population living in the vicinity of the nuclear facilities.

In April 2010, the Spanish Ministry of Health, Social Policy and Equality sent the final report to the Parliament and the results, together with the following conclusions:

- The doses accumulated by the population due to the operation of the facilities in the areas where the study has been carried out are very low and are far below levels that could have harmful effects for the health of the population.
- It has not been detected an increase in cancer mortality due to the operation of these facilities.
- An increase in cancer mortality due to natural radiation neither has been detected.

## Epidemiological study



## Control of radioactive waste

### Management of spent fuel and high level waste

The CSN exercises control over the inventory of spent fuel in nuclear facilities, the safety conditions in the fuel storage pools and the individual temporary storage (ITS) facilities for dry storage in casks.

As of 31<sup>st</sup> December 2010, the number of fuel assemblies in storage at the nuclear power plants amounted to 12,250: 5,453 in the nuclear power plants with boiling water reactors (BWR) and 6,797 in those with pressurized water reactors (PWR). 11,453 of them are stored in the pools of their respective plants and the rest (797) is stored in the individual temporary storage of the Trillo and José Cabrera plants.

Facing the next saturation of the pools of Ascó I and II, the licensing process for the building of an ATI facility in the location of the plant, based on the use of HI-STORM storage casks. The CSN favourably informed of the study on the safety of the HI-STORM 100 system.

Finally, the CSN published the Instruction IS-29 on *Safety criteria of spent fuel and high-level radioactive waste temporary storage facilities*.

### Management on low and intermediate high level waste

In Spain, Enresa manages the low and intermediate waste at El Cabril plant (Córdoba). In 2010,

4,049 waste packages or containment units were received at this facility, in addition to 28 samples from nuclear plants and 1,059 waste packages or containment units from radioactive facilities. During that year, nuclear power plants generated radioactive waste with an estimated activity of 19,138.73GBq, conditioned in 2,861 packages.

As in previous years, the CSN maintained control over the radioactive waste processing and storage systems in nuclear power plants, the fuel cycle and the package type acceptance process. In order to verify these aspects, there were inspections carried out at the Cofrentes, Almaraz and Santa María de Garoña plants, and in the José Cabrera and Juzbado facilities as well. The CSN also tracked the management by Enresa of atypical radioactive waste that was the company's responsibility.

As regards to very low level waste, the CSN has continued overseeing the operations at El Cabril's east platform, along with the management of uranium concentrate plant tailings and the restoration of uranium mines. Two inspections have been performed at the Saelices, El Chico (Salamanca) and four on the old uranium mines: two at the uranium mines of Valdemascaño and two at the Castilla de las Flores one, both already restored.

### Inventory of irradiated fuel and situation of the storage facilities at the Spanish nuclear power plants at the end of 2010

	ATI José Cabrera <sup>(1)</sup>	Sta M <sup>a</sup> de Garoña	Almaraz I	Almaraz II	Ascó I	Ascó II	Cofrentes	Vandellós II	Trillo	
									Pool	ATI
Occupied elements	377	1,985	1,204	1,192	1,100	1,080	3,468	908	516	420
Degree of occupation (%)	-	90	73	72	87	85	73	63	82	25
Year of Saturation of the pool or ATI	NA	2015	2021	2022	2013	2015	2021	2020	NA <sup>(2)</sup>	2040

(1) The nuclear plant is in dismantling phase. The fuel assemblies have been transferred to the Individual Temporary Storage (ATI).

(2) Due to the ATI facility, the saturation of the pool is not a problem.

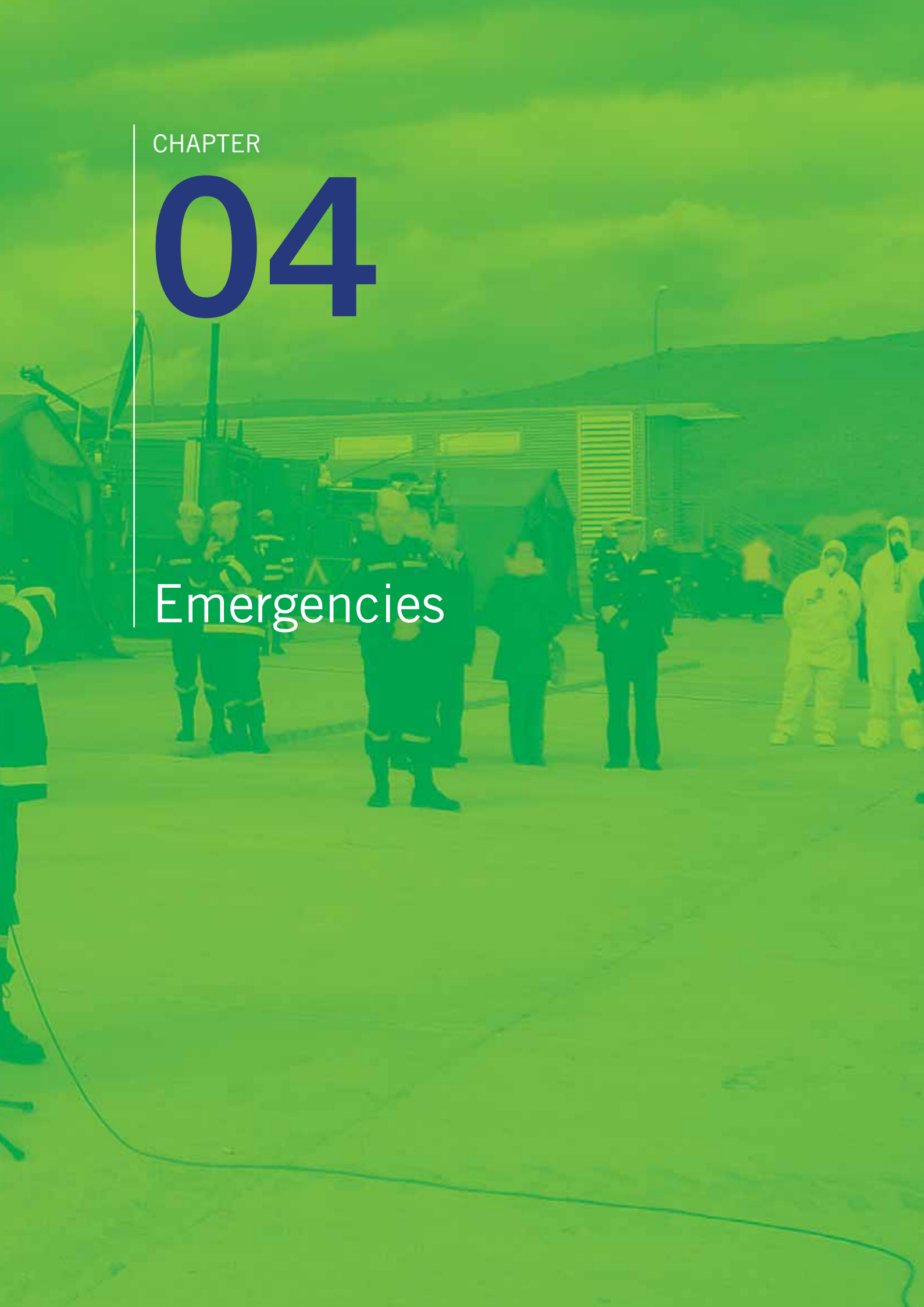
### Radioactive waste packages generated and disposed of at El Cabril in 2009 and packages stored on site at the facilities, equivalent to 220-litre drums

Facility	Conditioned activity (GBq)	Packages generated	Packages collected	Packages stored
Santa María de Garoña	7,010.95	549	554	4,092
Almaraz I and II	2,157.90	416	498	7,075
Ascó I and II	2,866.93	527	444	2,796
Cofrentes	6,532.71	936	1,065	7,895
Vandellós II	355.24	252	426	1,029
Trillo	215.00	181	180	610
<b>Total</b>	<b>19,138.73</b>	<b>2,861</b>	<b>3,167</b>	<b>23,497</b>

CHAPTER

# 04

## Emergencies





## Emergency preparedness

One of the CSN's missions, besides protection and safety in the facilities, consists of establishing measures to prevent and correct any radiological emergency, regardless of its source.

For this matter, the CSN takes an active role in the national system to deal with nuclear and radiological emergencies and it acts, sharing its experience and providing its resources in case of incident; to achieve this, it requires the participation of the licensees, regardless of their position, and the CSN promotes the collaboration of all the institutions and entities with the adequate technical resources. This participation is defined in the Emergency Response Organisation (ERO), an operational structure with human and technical resources and specialised proceedings as well for assisting the responsible authority in charge of the emergency in any point of the national territory.

The CSN has an emergency response room (Salem), an area equipped with sophisticated and redundant data processing and communication systems, which is the coordination centre of the ORE and is operational 24 hours a day, 365 days a year. It is manned by an emergency back-up team, which in the event of an emergency, specialist technicians would arrive in less than one hour. In Salem, all the available information on an emergency, its evolution and the effectiveness of the measures adopted are obtained and analysed. Its telecommunications systems and assessment tools make possible the monitoring of the incident, its potential consequences and protection measures

which must be performed depending on the severity of the event.

The CSN collaborates closely to perform this mission with the National Emergencies System: the Directorate General for Civil Defence and Emergencies of the Ministry of the Interior, with the delegations and sub-delegations of the Government, autonomous communities and the Military Emergency Response Unit of the Ministry of Defence. Moreover, the CSN is responsible for the Spanish participation in the international organisations and agreements on nuclear emergencies.





Among the actions taken in 2010, it points out the signing of the collaboration agreement with the Military Emergency Response Unit of the Ministry of Defence on the planning, preparation and response facing a nuclear and radiological emergency. In the framework of this agreement, throughout the year there were four working groups created and a project began to install an emergency response room at the headquarters located in Torrejón de Ardoz (Madrid).

In the field of international representation, the CSN took part in the national working group for the introduction of the NRBCh Action Plan of the European Union, which was organized by the Department of Infrastructure and Monitoring of Crisis Situations, Presidency of the Spanish Government.

The CSN also participated in an international simulation exercise organised by the Directorate

General for Civil Protection and Emergencies at the Barajas airport and it took responsibility to coordinate the INEX-4 exercise, organised by the OECD's Nuclear Energy Agency, which was a simulation of a malicious dispersion of radioactive materials in an urban environment. The Military Emergency Response Unit took responsibility for the actions in the field.



The organisation participated in four European Union Ecurie exercises and in three IAEA international Convex exercises, testing a new emergencies communication and attendance request (EMERCON).

The CSN's formative task continued its intensity during 2010: it did not only participate in the plan to provide the Guardia Civil with radiological protection training, but also in other training courses offered with the support of the National Civil Defence School of the DGPCE. Moreover, it continued collaborating in preparing courses for specialists in NRBC from the Ministries of Interior and Defence.

The CSN provided support to the exercises with the people responsible of the nuclear emergency plans of Burgos, Cáceres and Guadalajara. It also provided help to the development of a practical exercises organised by the UME.

As for the technological advances achieved in 2010, it should be pointed out that the new network to communicate with nuclear power plants became fully operational. N2 is a network that supports the current one and also, the tools of the room continued being improved.

As for its regulatory activities, throughout 2010, the modifications of the site emergency plans of the Santa María de Garoña and Vandellós II nuclear power plants, the José Cabrera facilities, the Juzbado fuel factory, the radioactive waste storage facility of El Cabril and the Quercus uranium concentrate plant were informed.

With regard to the incidents, during 2010 the Emergency Response Organisation of the CSN was activated on two occasions: on 11<sup>th</sup> June, because there was a fusion in a source of cesium at the Nervacero iron and steel industry in Valle de Trápaga (Vizcaya) and on 8<sup>th</sup> September due

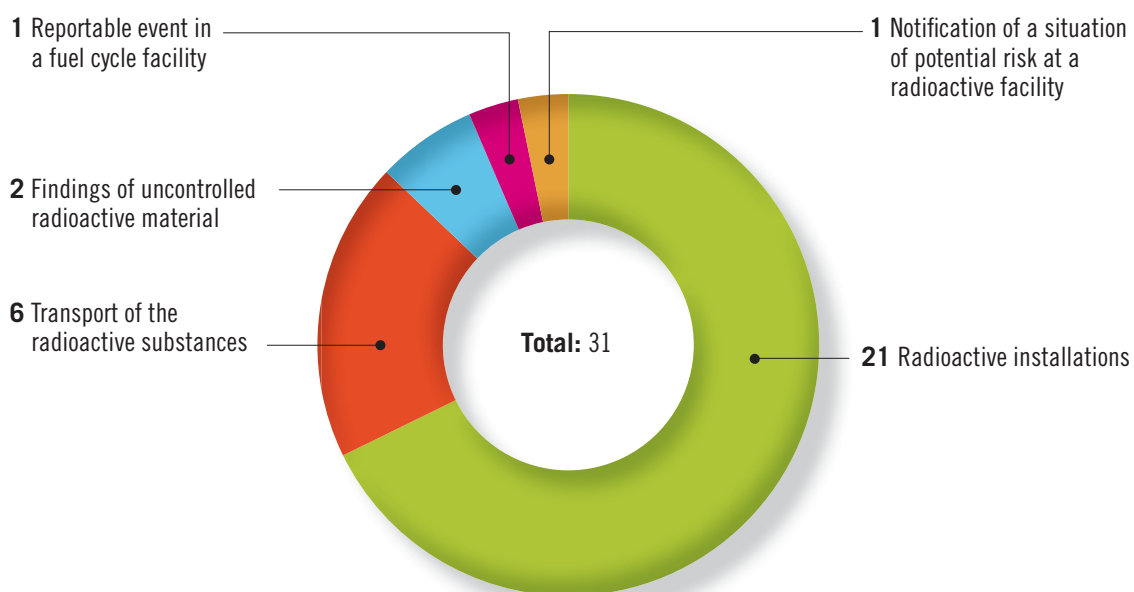




to the operations carried out to find the stolen radioactive equipment at the Montoro reservoir (Ciudad Real). Salem received 31 notifications of national incidents, 21 notifications of radioactive installations, six of the transport of radioactive substances, two of findings of uncontrolled

radioactive material, a reportable event in fuel cycle facility and a notification of a situation of potential risk at a radioactive facility. It should include the notifications of the events that happened in nuclear power plants already mentioned in chapter 2 of this report.

### Notifications of national incidents received in Salem



## Physical protection of nuclear materials and facilities

The CSN reported on the project for the Royal Decree that establishes measures for the protection of critical Spanish infrastructures, the transposition of the European Union directive on this matter. In addition, it issued a favourable report for the physical protection plans of the Ciemat and El Cabril.

Throughout 2010, it revised the operating regulations of all the nuclear facilities to verify the proper implementation of the safety systems. Furthermore, security systems at Ascó, Cofrentes, Vandellós II, Trillo, Ciemat and El Cabril were inspected for the verification with the compliance of the requirements set out in CSN Instruction IS-09.

On the occasion of the transfer of the title from Unión Fenosa to Enresa, the CSN carried out an inspection related to the physical protection of the José Cabrera plant and the plant's on site spent fuel storage facility.

In 2010, the work for the integration of safety, one pillar of its strategy, in the Integrated Plant Supervision System (SISC) was completed, including the Basic Inspection Plan, the operating indicators and the process to set the importance of security on the inspections results. It will be implemented in the testing phase in 2011.

During this year, the CSN signed an action protocol in the event of detecting inadvertent

movement or illicit trafficking of radioactive materials in ports of general interest of the State, with the Ministry of Industry, Tourism and Trade; the Ministry of Foreign Affairs and Development with Enresa and the State Tax Administration Agency.

In the framework of international cooperation, the CSN participated in security activities promoted by the IAEA. People attended courses given by the Nuclear Regulatory Commission (NRC) and the Regional Training Course (RTC) held in Paris. The CSN personnel also travelled to Germany for the seminar on the framework of the Global Initiative to Combat Nuclear Terrorism, initiative led by both the USA and Russia.



A person wearing a white lab coat, safety glasses, and white gloves is shown from the chest up. They are holding a test tube in their right hand and a glass flask in their left hand. The background is a solid light blue color. The entire image is overlaid with a semi-transparent blue filter.

CHAPTER

# 05

Research  
and development

## Research and development (R&D)

Research, development and innovation in all areas relating to nuclear safety and radiological protection are activities promoted, overseen and financed by the CSN to increase the scientific capacity of its technical personnel, because of the qualification and top-notch professional experience required by the safety control of the Spanish nuclear and radioactive facilities and the technical proposals drawn up by the CSN. The organisation based its activities on fundamental lines of research as a scientific and technical basis for the subsequent processes of analysis and decision-making.

This level of technical competence and independent opinion can only be achieved and maintained in so far as the CSN incorporates, obtains and assimilates in its working methods and proceedings the best know-how about nuclear technology use and the resources to control the related risks. The international regulatory framework in which the CSN operates make inevitably that the knowledge acquired through good practices and its constant innovation through application in its daily work imply participation in the research and development programmes carried out in the nuclear safety and radiological protection fields, either in Spain or in countries with recognised and developed nuclear technology.

The research and development activities carried out by the CSN, not directly but through promotion and financing of projects are under a

planning system which is embodied in four-year plans. The Research and Development Plan for the period 2008-2011 establishes the conditions under which the projects will be undertaken throughout this period.

The current plan is structured in broad programmes which include projects whose objectives are common or mutually interrelated, so the integrity and effectiveness of the structural elements based on the implementation of the safety criterion at any cost is ensured. It is structured around eight programmes or courses of action: nuclear fuel and reactor physics, radioactive waste, control of exposure to radiation, dosimetry and radiobiology and emergency management and incident analysis.



The pursued objectives are as follow:

- Contribution to ensure a high level of nuclear safety and radiological protection at the current facilities, until the end of their lifetime.
- Improvement in the surveillance and control of the exposure of the workers and public to ionising radiations.
- Continuation of the development of radiological protection in medical exposures.
- Availability of the know-how and technical resources to estimate the risks associated with future installations.

In 2010 a new computerised system for the management of the R&D activities has been set off, to simplify monitoring of the projects; at the same

time, based on this new system, the development of other IT applications has started to facilitate the information exchanges with the entities that cooperate with the CSN in R&D projects.

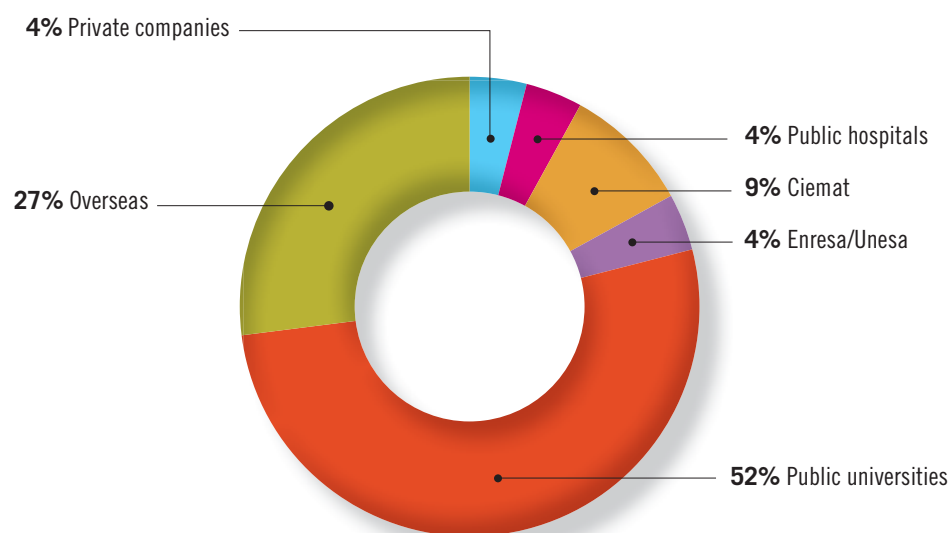
In the framework of modelling and safety assessment methodologies, it is worth stressing out the work in progress about the use of favourable tools for modelling to predict the consequences of a fire at a nuclear power plant, including those originated outside the plant, of tornadoes and floods. It is also worth stressing the beginning of a specific project on the frequency and characteristics of tornadoes that may occurred in the surroundings of the Spanish nuclear facilities.

During this year, the CSN has managed 54 R&D projects, in collaboration with almost thirty national and international organisations, with a budget almost equal to that of 2009.

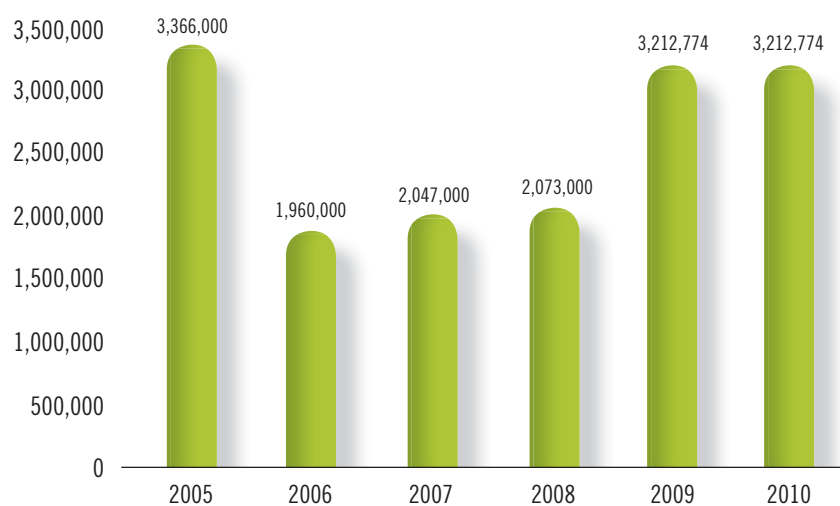




### Distribution of R&D costs among the different collaborating entities



### Evolution of the CSN R&D&i budget from 2005 to 2010





CHAPTER

# 06

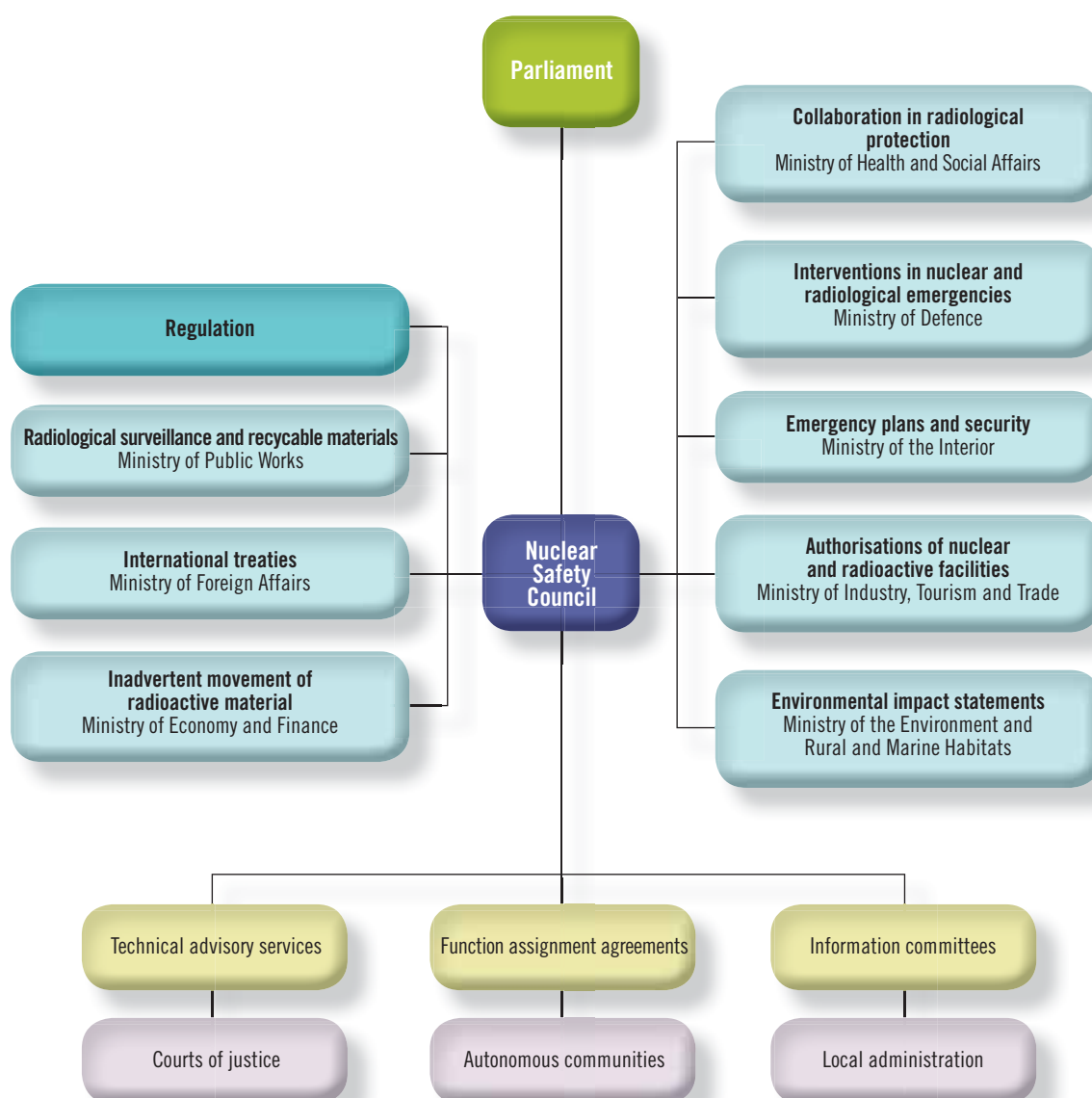
Institutional  
relations

## Institutional relations

In the exercise of technical or consultative functions, the CSN works together with a large number of institutions at national, autonomous and local level. Besides these relations with the Parliament

and other public institutions, it has collaboration and advisory relations with professional and trade union organisations and with non-governmental associations relating to its areas of activity.

### CSN institutional relations chart







According to the Law by which it was created, the CSN is an independent body accountable to Parliament. For this matter, the CSN submits an annual report to the General Courts and autonomous parliaments of those autonomous communities where nuclear facilities are located, a report that describes in detail the activities performed during the previous year. In addition, the President of the Council appears before the Commission for Industry, Tourism and Trade of the Congress of Deputies to present the aforementioned report. Moreover, as part of its relations with the Courts, the CSN responds to the requirements of the different political groups through parliamentary questions and resolutions in to relation the annual report.

During 2010, the Nuclear Safety Council submitted 29 reports in response to the 33 approved resolutions approved on the Annual Report relating to activities from 2008. Furthermore, it replied to 21 parliamentary questions.

In the framework of the relations with the General State Administration, in 2010, the CSN

has continued collaborating with the Ministry of Industry, Tourism and Trade; the Ministry of the Interior; the Ministry of Defence; the Ministry of Education; the Ministry of Science and Innovation and the Ministry of Health, Social Policy and Equality.

In the framework of the collaboration with the Ministry of Education, in activities related with training of the teachers, there was a meeting held to present the teaching guidelines for primary and secondary schools, *Radiation and radiological protection*. With the Ministry of Science and Innovation, through the Carlos III Institute of Health, the CSN coordinated communication actions for the spreading of the Epidemiological Study presented to the Congress of Deputies on 23<sup>rd</sup> April for the Ministry of Health, Social Policy and Equality. With the latter Ministry, the CSN also signed a framework agreement to collaborate in the fields of radiological protection and dosimetry control.

The relations with the autonomous administrations were marked by the annual meeting between the

CSN and the delegations and sub-delegations of the Government where there is any nuclear facility. Besides, the activities with the autonomous administrations of Asturias, the Balearic Islands, Catalonia, Galicia, the Canary Islands, Murcia, Navarre, Valencia and the Basque Country continued through the function assignment agreements. Among the many activities carried out, the signing of the delegation agreement revision with the Basque Country stands out, by which this community builds competencies for processing licences and homologating courses.



As regards to the local administration, the CSN collaborates regularly with those municipalities where there are nuclear power plants, participating actively in the Information Committees that are held once a year in the surroundings of the nuclear power plants. Likewise, the CSN maintains institutional communication with the Association of Municipalities in Areas housing Nuclear Power Plants. Precisely, during 2010, this association collaborated in the diffusion of the Epidemiological Study's results.

In the framework of institutional relations and within its regulatory field, the CSN has agreements with companies and institutions related to the

sector. In 2010, a collaboration agreement with the Spanish Electricity Industry Association (Unesa) for the cession of the management for a new emergencies communication network and with Enresa for its participation in R&D projects. It also collaborated with the organisation of the seminar on Design Basis Threat. With Red Eléctrica de España, the CSN signed a collaboration agreement to exchange information.

Under this same line of work is the continuity of the chairs through which the CSN collaborates with the Polytechnic University of Catalonia and the Polytechnic University of Madrid, and with various universities of the national territory about the environmental radiological surveillance through specific agreements. Besides, the CSN has responded to requests for information from non-governmental organisations involved in environmental protection and sustainable development.

Finally, within the institutional framework of the CSN, the aid programme for training, information and dissemination initiatives relating to the activities of the CSN has continued, as well as the programme of institutional visits that began in 2008 with the aim of promoting institutional collaboration and strengthening the transparency of the organisation.





CHAPTER

# 07

## International relations



## International relations

The work performed by the CSN has an important international dimension. The Law by which it was created commissioned the CSN with some functions that consist of a number of international activities, both technical and institutional, which are developed on two different levels: the multilateral level through organisations, institutions and international forums and the bilateral level through technical cooperation agreements and collaboration with its counterpart institutions. The aforementioned activities allow discussing or deciding about matters related to nuclear safety and radiological protection, as well as exchange experiences and regulatory practices with other regulatory bodies.

The CSN, taking account of its competences, takes part in the compliance of Spain with the commitments taken when it joined different conventions and advises the Government about its commitments on nuclear safety and radiological protection with other countries and international organisations.

Among the advising activities carried out by the CSN in 2010, it stands out its collaboration to support the Spanish European Union presidency, in the framework of the Atomic Questions Group (AQG), whose task is to advise the EU Council on the matters concerning the Euratom Treaty.

Within the European Nuclear Safety Regulators Group (ENSREG), the CSN took part in the

working sessions to prepare a draft on the European directive, to establish a framework that ensures the responsible and safe management of the spent fuel and radioactive waste.

Among the technical cooperation activities, the Council took part in the regulatory assistance programmes in the nuclear safety field and in the European Union pre-accession projects. The most remarkable aspect for this matter, has been the assistance provided to the Jordanian regulatory organisation, the regulatory authority of Egypt and the creation of the regulatory organisation of Morocco. In the framework of the IAEA, we must mention the technical cooperation within the Action Plan for the strengthening of the regulatory structures in the North African and Latin American countries.



In relation with the upcoming participation of Spain in international conventions, the CSN started to work in the preparation of the National Report that will be presented in the fifth review meeting of the Convention on Nuclear Safety that will take place in April 2011. Similarly, the fourth national report for the Joint Convention on the Safety of Spent Fuel Management and on the safety of Radiactive Waste Management started.



Within the framework of bilateral relations with the United States of America, the CSN and the American regulatory body, the Nuclear Regulatory Commission (NRC), in 2010, renewed the framework agreement to exchange technical information and collaborate in the nuclear safety field, which included elements on physical protection.

In relation with the bilateral relations, the CSN and the French Nuclear Safety Authority (ASN) continued with the programme of joint activities shared, of which the exchange of personnel and cross-inspections stand out. In 2010, the CSN received an ASN delegation to exchange information on the human resources available at both organisations. In December, the joint committee was formed in charge of the agreement signed in 2009 by both institutions for the planning, preparation and management of a nuclear or radiological emergency situation.

Throughout 2010, the CSN has also held bilateral meetings with the regulatory bodies of Germany, Argentina, Lithuania, Portugal, Russia, Sweden and Ukraine.

Like in previous years, the CSN continued taking part in the activities and working groups of the International Atomic Energy Agency (IAEA) and the Nuclear Energy Agency (NEA/OCDE). Regarding the IAEA, it is worth mentioning the preparation of the follow-up IRSS mission that will be received at the beginning of 2011 and the IAEA Commission on Safety Standards for the development of the nuclear safety and radiological protection regulation, which represents the first international reference.

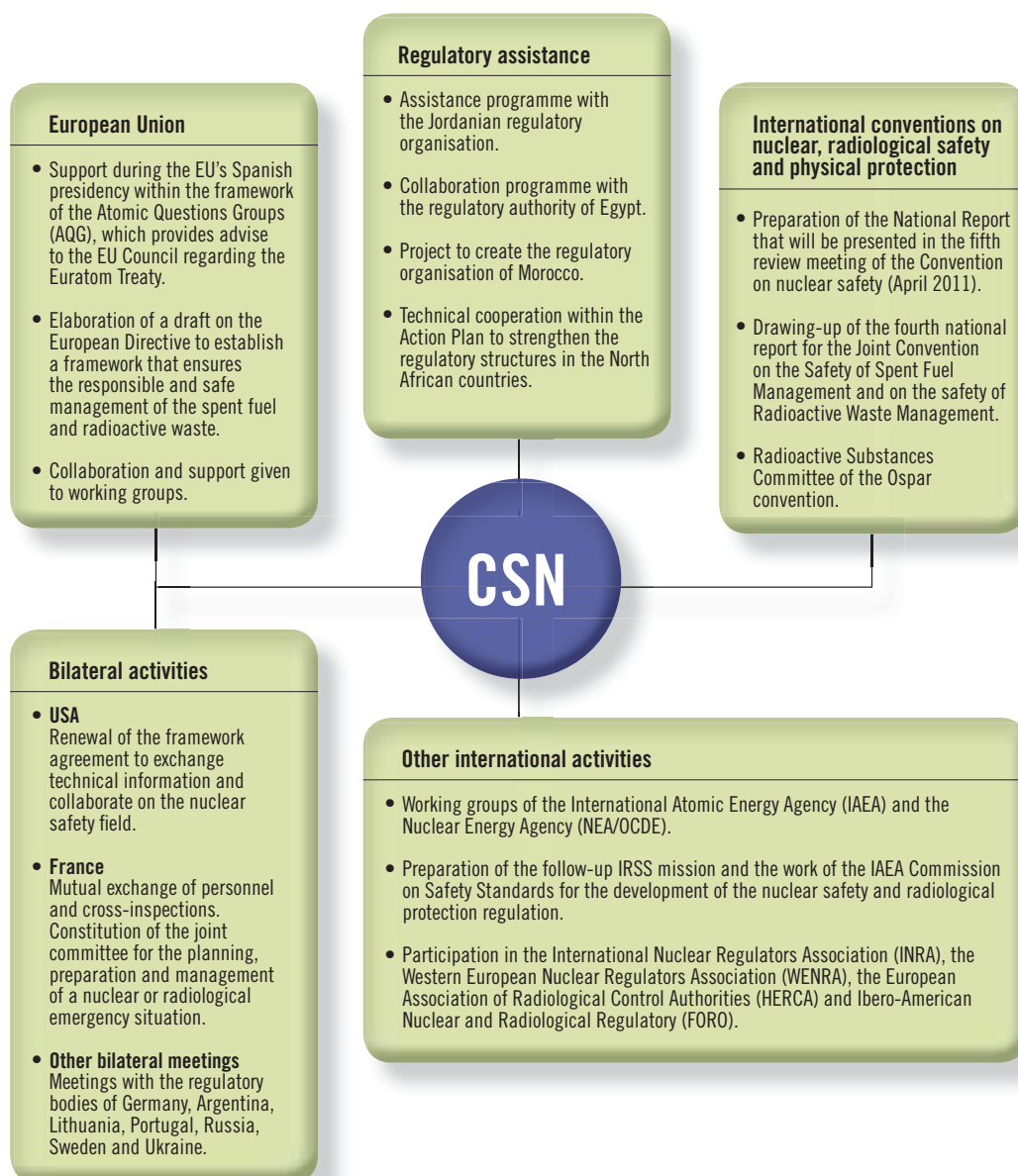
The CSN participated actively on activities planned by associations of nuclear safety and



radiological protection regulators, especially in the International Nuclear Regulators Association (INRA), the Western European Nuclear Regulators Association (WENRA), the European Association of Radiological Control Authorities (HERCA) and the Forum

of Ibero-American Nuclear and Radiological Regulatory Authorities (FORO), the latter being recognised as an important space of cooperation in the framework of the Ibero-American summit of Head of States that took place in 2010.

### CSN participation in international organisations





A person in a blue shirt is working on a laptop. The image is overlaid with a semi-transparent green filter. The person's face is partially visible on the left, looking down at the laptop. Their hands are on the keyboard, and a pen is visible near the laptop. The background is blurred, showing what appears to be a desk or office environment.

CHAPTER

# 08

## Public information and communication



## Public information and communication

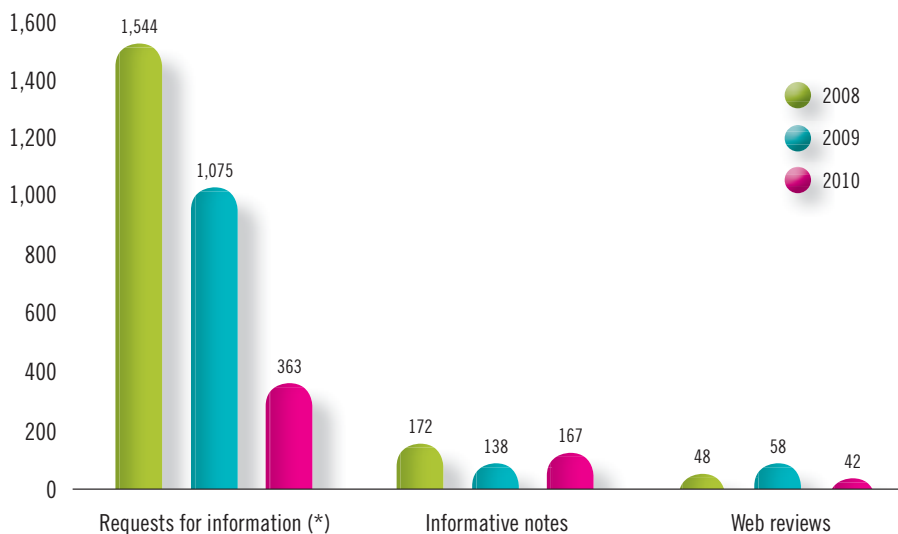
The CSN mission is to protect workers, the population and the environment from the harmful effects of ionising radiations. For the compliance of this mission, the Law by which the CSN was created emphasised the organisation's credibility and transparency so that the public receives information and the CSN gains the confidence about the organisation's actions.

In order to achieve these goals, the CSN must be seen as an independent, efficient, rigorous and reliable organisation, providing clear and detailed information of its action plans to the interested parties. Therefore, it makes participation easier and shows that its actions are independent and objective.

The CSN uses ways of communication and strategies to reach the public and the media to develop a transparent policy of public information, so that not only the adequate transmission of information is granted, but also transparency and overall the approach to society. In this work, every type of media required is used, from the classic ones to the new information technologies, among which the Internet has a prominent role.

As for the information submitted to the media and the organisations interested in the matters the CSN deals with, throughout 2010, there were 167 informative notes sent and 42 web reviews about reportable events published. For its part, there were 363 requests for information that were duly answered.

### Evolution of communication activities in 2008-2010



(\*) Corresponds to requests received and dealt with.

The renewal of Almaraz and Vandellós II, approved by the CSN Plenary, caused great interest in the media, therefore three press releases and two explanatory notes were uploaded to the CSN website.

Other relevant issues were the 30<sup>th</sup> anniversary celebration of the organisation and the dissemination of the Epidemiological Study results, a study that was carried out in collaboration with the Carlos III Institute of Health that has been already mentioned.

In 2010, media issued 1,380 news items alluding to the CSN. The positive news published or broadcasted were 1,131, compared to the 26 negative news and the 223 that were neutral.

The CSN website continued facilitating access to information about the CSN and received

263,404 visits during 2010. Its continuous renewal with 2,518 updates throughout last year allowed the public to receive a prompt reply to their information demands.

Following the proactive policy regarding public information, 40 titles were published, including technical publications, the journal *Alfa*, publications with accessible content, CDs, leaflets and posters, with a distribution of 40,096 copies. Moreover, there has been 23 titles re-published that has been exhausted during the year, with a circulation of 45,000 copies. Similarly, several informative materials were made for the CSN Information Centre and for the celebration of the 30<sup>th</sup> anniversary of the creation of the CSN. During 2010, there was a total distribution of 72,284 technical and general interest publications.

The CSN Information Centre, at its headquarters since 1998, received 7,620 visitors, most from educational centres and institutions, to reinforce the task of spreading information and having contact with the public. In collaboration with the Community of Madrid, in the annual open day, this centre welcomed anybody interested in understanding the CSN's activities. This year, it received visitor number 70,000 who was a student of one of the schools that asked to visit the centre. During the tour, one contribution to the creation of the centre, Manuel Toharia, together with the CSN's secretariat general gave a souvenir of the visit.





The participation in different technical events like conferences and exhibitions where the CSN assists with a stand of publications allowed it also to have a closer contact with the public, who receive for free the material that they ask for. In 2010, the CSN participated in a day about the new *Regulation on the Installation and Use of X-Ray Apparatus*, organised by the Spanish Association for Radiological Protection; in the 16<sup>th</sup> edition of the Science in the Street Day celebrated in La Coruña; in the presentation day for the Epidemiological Study in the Carlos III Health Institute of Madrid; in the 6<sup>th</sup> Edition of the *Environmental Radioactivity Quality Control Days* that was held at the University of Cáceres; *Empirika, Ibero-American Science, Technology and Innovation Fair* that took place in Salamanca; and *Conama 10, Spanish National Environment Conference* in Madrid.

From April 2003, the CSN has signed a framework convention of collaboration with the Ministry of Education for permanent teachers training in the year 2010 and continuing the

projects made in the two previous years, there was a presentation day of the two manuals, under the two agreements reached: *Radiation and Radiological Protection. Instructional Guide for Primary Schools* and *Radiation and Radiological Protection. Instructional Guide for Secondary Schools*.

During the year, there were three conferences given. The first one was *The Role of Electricity in a Sustainable Energy Model* of which Luis Atienza was in charge, President of the Red Eléctrica de España; followed by *The New OECD/NEA Nuclear Safety-Related Activities* given by Javier Reig, Director of the NEA Nuclear Safety Division; and finally the *Nuclear Safety in Ukraine after the Chernobyl Accident* that was carried out by the President of the Ukrainian regulatory body, Olena Mykolaichuk.



CHAPTER

# 09

## Regulations

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CONSEJO DE  
SEGURIDAD NUCLEAR

## Regulations

The independence conferred by the Law that created the CSN comes to fruition, among other elements, in its regulatory authority which means it can issue technical standards of regulatory status, under the terms established by the Law. Similarly it has legal authority to impose penalties, to propose and, where appropriate, initiate, process and resolve certain administrative procedures for cases of non-compliance by the licensees of nuclear and radioactive facilities, in the terms established in the legislation.

Because of this, the CSN has the power to issue instructions, circulars and technical guides relating to nuclear and radioactive facilities as well as nuclear safety and radiological protection. The standards can be compulsory, such as instructions; advisory, like safety guides; or informative, like the informative circulars.

In addition, according to the Law by which it was created, the CSN must facilitate the access to information and civil society and public participation in its operation. Therefore, in the process of developing a standard, instructions and safety guides are submitted to public comments through the corporate website that facilitates access to the public.

Throughout 2010, the Council has approved six instructions and a safety guide related to the competence of laboratories and services to measure radon. The most part instructions

had their origin in the development of the commitments made on the harmonisation of the standards within the Western European Nuclear Regulators Association (WENRA), although there are also efforts made towards the finishing of the standard development on fields such as radiological protection regulation against naturally occurring ionising radiations or the dismantling regulation and radioactive waste management.





## Council instructions approved in 2010

- **Instruction IS-24**, of 19<sup>th</sup> May 2010, of the Nuclear Safety Council, regulating the filing and retention periods of documents and records of nuclear facilities (BOE Nº 133, of 1<sup>st</sup> June 2010).
- **Instruction IS-25**, of 9<sup>th</sup> June 2010, of the Nuclear Safety Council, on criteria and requirements on the performance of probabilistic safety assessments and their applications for nuclear power plants (BOE Nº 153, of 9<sup>th</sup> June 2010).
- **Instruction IS-26**, of 16<sup>th</sup> June 2010, of the Nuclear Safety Council, on the basic nuclear safety requirements applicable to nuclear facilities (BOE Nº 165, of 8<sup>th</sup> July 2010).
- **Instruction IS-27**, of 16<sup>th</sup> June 2010, of the Nuclear Safety Council, on general criteria of the nuclear power plants design (BOE Nº 165, of 8<sup>th</sup> July 2010).
- **Instruction IS-28**, of 22<sup>nd</sup> September 2010, of the Nuclear Safety Council, on the performance technical specifications which second and third category radioactive facilities must comply with (BOE Nº 246, of 11<sup>th</sup> October 2010). Correction of errors (BOE Nº 281, of 20<sup>th</sup> November 2010).
- **Instruction IS-29**, of 13<sup>th</sup> October 2010, of the Nuclear Safety Council, on safety criteria at spent fuel and high-level radioactive waste storage facilities (BOE Nº 265, of 2<sup>nd</sup> November 2010).



During the year 2010, the regulatory framework of the institution has been affected by the approval and official publications of various provisions. Among these provisions, Royal Decree 1440/2010, of 5<sup>th</sup> November, is particularly significant because it approved the CSN Statute and established the Advisory Committee for Public Information.

It is also important to mention the Law 6/2010, of 24<sup>th</sup> March, that modified the Law on Environmental Impact Assessment of projects; Royal Decree 1439/2010, of 5<sup>th</sup> November, by which the Regulation on Health Protection against Ionising Radiations was modified and Royal Decree 1564/2010, of 19<sup>th</sup> November, by which the Basic Directive on the Planning of Civil Defence against Radiological Risks was approved.

Furthermore, the CSN has been part of the promotion and has given impetus to several regulatory projects of different ranks, including the analysis to ensure that the national legislation complies with Directive 2009/71/Euratom, which establishes a Community framework for the nuclear safety of nuclear installations. Likewise it has been part of the preparation of the draft royal decree that will eventually replace Royal Decree 158/1995 on the Physical Protection of Nuclear Materials; of the draft amendment proposal of the Regulation governing Nuclear and Radioactive Facilities and of the Law proposal on the Civil Liability on Nuclear Damage.

As for the legislative development on an international level, throughout 2010 the CSN has collaborated with the IAEA to offer the Spanish-speaking community the guideline texts in Spanish created for the aforementioned international agency. It has also taken part in various activities in the framework of the IAEA Commission on Safety Standards, developing standards on nuclear safety and radiological protection, which constitutes the first international reference. Finally, it has attended activities within the working groups related to the harmonisation of the standards in the nuclear safety field.



A person in a dark suit and white shirt is shown from the chest up, looking upwards with their head tilted back. The background is a bright blue sky with soft, white clouds. The image has a semi-transparent green overlay.

CHAPTER

# 10

Management  
and resources

In order to meet its obligations attributed by Law and effectively address the society's expectations, the Nuclear Safety Council drafts a Strategic Plan that takes into account the current conditions of the environment and the predictable future conditions, sets the results that plans to achieve and the strategies and objectives for the five-year period. Due to the fact that the current plan is set for the 2005-2010 period, during this year it has been working on a new document that will cover the 2011-2016 period. This proposal was submitted

to the Board of Commissioners of the Council on 21<sup>st</sup> December for its approval.

The Strategic Plan is used as a basis for the Annual Work Plan (PAT), which includes the operating objectives and the most significant activities to be performed during each year. The PAT 2010 was prepared following the planning model implemented at the CSN. Its follow-up was performed through a panel board that includes indicators of the evolution of the most significant activities expected and its comparison with the purposes previously established.



## Management systems

The Management System implemented at the CSN is based on the requirements of the IAEA and the ISO standards and is oriented towards strategic, operative and support processes which are documented in the Management System Manual, the Organisation and Operating Manual and the procedures that develop this system.

This Management System is subject to ongoing improvement through the assessment of compliance with the plans and objectives, internal audits and external assessments by national and international organisations. Throughout 2010, the CSN's map of processes, included in the Management System Manual, was revised.

During the year 2010 and due to the consequences of the recommendations and suggestions made by the IRSS mission, new improvements have been introduced:

- The internal audit programme for management processes has continued. Throughout the year a training course has been given for internal auditors and nine audits.
- After the approval of the new CSN Statute in 2010, the Advisory Committee for Public Information and Participation has been implemented and a new process to redeploy the personnel has been initiated. Equally, communication, report writing and management skills have been included in the training plans.
- A new system has been included to evaluate the new SISC inspection programme and new inspections of operative experience.
- The annual systematic gathering of the results of inspections to radioactive facilities continues.





## Training plan

The 2010 Training Plan was prepared so that its goals were aligned with the CSN 2005-2010 Strategic Plan, and it has been structured around seven areas: nuclear safety, radiological protection, development of management, organisation and communication skills; as well as regulations, administration and management; information and quality systems; languages and training of officers in training.

A total number of 33,455 hours were devoted to staff training, equal to 4.5% of the working day. A total cost of 634,539.20 Euro, i.e. an average

value of 1,353 Euro/employee, while the average personnel participation was 2.6 training courses per person.

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

### Evolution of CSN personnel training 2007-2010

	2007	2008	2009	2010
Workforce	453	452	478	469
Persons attending training	947	1,181	1,201	1,219
Average of participation	2.09	2.60	2.50	2.60
Number of courses	75	88	128	137
Number of training hours	39,828	46,331	37,510	33,455
Percentage of training hours in a working day	5.28	6.00	4.95	4.50
Total cost	476,584.14	686,448.06	701,923.27	634,539.20

## Human resources

At the closure of the year 2010, the CSN's staff was 469 workers, 51.80% women and 48.20% men with an average age of 49.

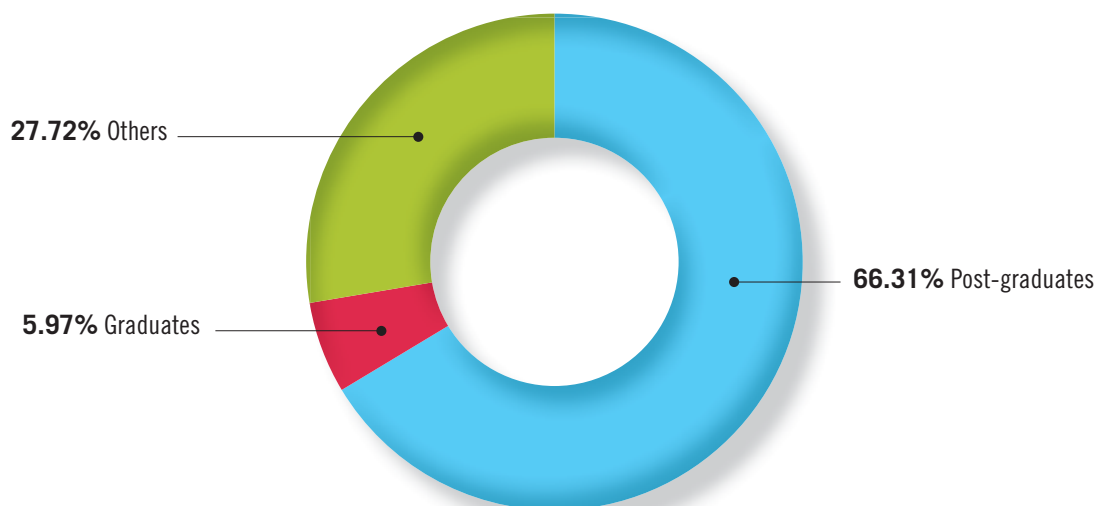
Of the staff working in this institution, 66.31% are post-graduates, while 5.97% are graduates and 27.72% have other qualifications.

In 2010, the four candidates who had passed the relevant selective process in 2009 were appointed as civil servants in the Upper Scale of Nuclear

Safety and Radiological Protection Corps. Also, a candidate who passed the selective process for a worker outside the agreement was also accepted.

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

### Qualifications of CSN personnel



## Economic resources

The Spanish Nuclear Safety Council is financed mainly by the rates and the public fees for the services rendered, which are provided when it performs its functions such as granting nuclear safety and radiological protection. The rates in consideration of the services provided and the public prices for the performance by the Council, at the request of a party, of reports, tests or studies about new designs, methodologies, simulation models or verification protocols related to nuclear safety or radiological protection.

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

Regarding income, duties paid amounted to 40.03 million Euro, an 87.2% of budget execution, with a -3.29% variation compared to 2009, mainly because the property income decreased and the lack of income from current and capital transfers from the State. 99.4% of the income was from rates.

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

As regard to finances, in 2010 the profit and loss account showed a positive income that amounted to 0.89 million Euro. Regarding income, rates for services rendered by the CSN were the main source of finance for the CSN; they represented 89.48% of the total amount; the remaining 10.52% were for current transfers and subsidies, financial income and other management income.

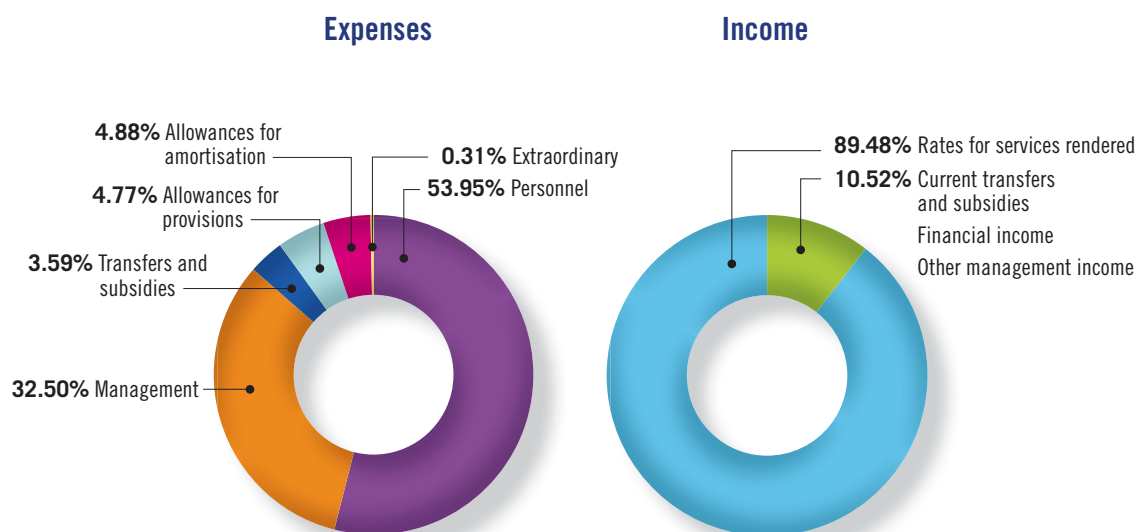
As regards to expenses, 53.95% was for the personnel expenses, 32.50% for other management expenses; 3.59% for transfers and subsidies; 4.88% for allowances for amortisation; 4.77% for allowances for provisions and 0.31% for extraordinary expenses.

The balance sheet at the close of the 2010 fiscal year reflects the balance between assets and liabilities, with a total amount of 44.95 million Euro. The asset is structured as follows: 41.7% corresponds to tangible fixed assets; 5.1% intangible fixed assets; 18.6% to debtors; 34.2% to treasury and the remaining percentage to temporary financial investments and timing adjustments. As regards liabilities, 96.4% corresponds to own funds, 3.2% to short-term creditors and 0.4% to provisions for risks and expenses.

### Evolution of CSN budget management during the five-year period 2006-2010 (Euro)

	Definitive budget	Execution of income budget	Execution of expenses budget
2006	41,885,258	41,599,341.02	37,547,887.99
2007	43,823,950	43,531,433.76	39,898,931.89
2008	45,243,730	45,688,314.26	41,210,158.31
2009	51,197,630	48,023,550.13	44,544,081.00
2010	50,977,300	40,034,400.84	42,777,334.48

### Execution of budget 2010





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