Nuclear Safety Council report to the Parliament

Summary of 2015

CSN

CSN CONSEJO DE SEGURIDAD NUCLEAR

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Introduction

The Annual Report contains information on the main activities carried out by the CSN in relation to nuclear safety and radiological protection during 2015. It is the first step to fulfill its obligation to report to the Spanish Parliament under the Law 15/1980, of April 22nd, by which the Nuclear Safety Council was created.

Throughout 2015, once again, the nuclear and radioactive facilities in Spain have operated safely and the radiation protection measures have ensured the protection of the personnel, the public and the environment from the risks of exposure to ionising radiation.

Security conditions were proven effective and the goal of this organisation was met due to the good work and cooperation of everyone involved, from the licensees of the facilities, their employees, authorities and institutions to the regulatory body and its personnel. However, it is necessary to keep in mind that to continue along these lines, there is no room for complacency.

In this regard, it is worth noting that in 2015 the CSN has continued its activities of: licensing, supervision and control, development of regulations and, when necessary, the proposal of sanctions for possible infractions. Also, it has continued the advice work and active intervention of both national and international groups, with an intense international cooperation among different organisations and associations of which the CSN is part, and nationwide through an intensive collaboration with other administrations and public institutions.

In addition, the Nuclear Safety Council has continued funding research and development projects in the field of nuclear safety and radiation protection, with the conviction that it is a valuable source of information that directly affects the excellent performance of our professional technicians.

And certainly, one of our main activities addressed to society, a strategic process within the framework of transparency, is the communication and information to the public. Besides this being our duty as it is established by the standards, one of the key points of the Nuclear Safety Council is to fulfill our mission of protecting the workers, the public and the environment from the harmful effects of ionising radiation. In this regard, during 2015, we have focused on the complete renewal of our institutional web, in order to be the main channel to integrate information and a communication platform for the public, in addition to our participation in seminars and local committees, and responding to requests for information.

Finally, it is fair to say that once again, the Nuclear Safety Council has kept at all times, even in situations of controversy, the essence of what this organisation means. It has also proven its independence, neutrality, technical rigour, transparency and effectiveness and efficiency to guarantee nuclear safety and radiation protection, as the sole competent authority in the field.

Fernando Marti Scharfhausen

Chapter I. The Nuclear Safety Council

1. The Nuclear Safety Council

The Nuclear Safety Council is an organization under public law, independent from the General State Administration, with its own legal standing and equity independent from those of the State. The Nuclear Safety Council was created as the only organisation responsible for nuclear safety and radiation protection, in accordance with Law 15/1980 of April 22nd.

The legal framework under which the Nuclear Safety Council operates is based on the prevalence of its constitutional law, its Statute and the standards and legal system common to other public organisations under public law linked to the General State Administration. It acts with organic and functional autonomy, fully independent from the public administrations and stakeholder groups, without prejudice of being subject to parliamentary and judicial control.

The Statute of the Nuclear Safety Council, drawn up by the Council itself and approved by the Government in accordance with the provisions of Law 15/1980, was approved by Royal Decree 1440/2010, of November 5th.

The mission of the CSN is to protect the workers, the general population and the environment from the harmful effects of ionising radiations, ensuring that nuclear and radioactive facilities are operated by the licensees safely, and establishing preventive and corrective measures with regards to radiological emergencies, regardless of their origin.

The CSN is responsible for performing all the functions set out in Article 2 of Law 15/1980, of April 22nd, and in Title I of its Statute, including especially the functions of producing and issuing reports prior to resolutions of the Ministry of Industry, Energy and Tourism, of inspection and control, of proposing legislation and elaboration of instructions, assessment, etc., as well as the exercise of other functions that, in the field of nuclear safety, radiation protection and physical protection are assigned by legally binding rules, regulations or International treaties.

In addition, article 11 of Law 15/1980 establishes that every year the Nuclear Safety Council shall submit a report on the development of its activities to the two chambers of the Spanish Parliament and to the regional Parliaments of the autonomous communities with nuclear facilities in their territory. The objective of the present report is to meet this requirement.

The governing bodies of the CSN are the Plenary and the Presidency, whose members as of December 31st, 2015 are:

- President: Fernando Marti Scharfhausen (Royal Decree 1732/2012, of December 28th).
- Vice-president: Rosario Velasco García (Royal Decree 138/2013, of February 22nd).
- Commissioner: Cristina Narbona Ruiz (Royal Decree 1733/2012, of December 28th).
- Commissioner: Fernando Castelló Boronat (Royal Decree 139/2013, of February 22nd).
- Commissioner: Javier Dies Llovera (Royal Decree 934/2015, of October 16th).

The Plenary of the Council is assisted by a Secretary General, a post held as of December 31st by María Luisa Rodríguez López (Royal Decree 268/2013, of April 12th).

Other management bodies are the Technical Directorates, the Technical Office of the President and the sub-Directorates.

The President and the members of the Council carry out their activities as assigned to them by Articles 26 and 36 of the Statute.

In addition, the Council has an Advisory Committee for Public Information and Participation whose mission is to improve transparency, public access to information and public participation.

1.1. The Plenary

The Plenary of the Council is the upper management body responsible for adopting agreements to perform functions contemplated in Article 2 of Law 15/1980, as well as the performance of any other functions that might be attributed to the Nuclear Safety Council as the only competent authority in the field of nuclear safety and radiation protection.

In 2015, the Nuclear Safety Council held 34 Plenary sessions and passed a total of 359 resolutions. All of these resolutions were passed unanimously.

Following Article 14.2 of Law 15/1980 of April 22nd, creating the Nuclear Safety Council, the minutes of the Council's Plenary sessions and the decisions that support the resolutions of the Plenary are available for general consultation on the CSN website (www.csn.es).

1.2. Council's Commissions

The Council's Commissions have promoted the activities assigned to the organisation in the fields of nuclear safety, and radiation protection and standards.

The Nuclear Safety and Radiological Protection Commission

The Nuclear Safety and Radiological Protection Commission is held under the chairmanship of the President of the Council and constitutes a forum for the exchange of ideas between the Technical Directorates of the organisation and the members of the Plenary. Their aim is to report on forecasts regarding issues to be submitted to the Plenary in the short term, and to encourage open debate on proposals or matters of high interest and technical complexity.

In 2015, this Commission held three sessions with 10 subject-specific presentations made on various matters.

Commission on Safety Standards

After the resolutions that were met in the Plenary session of September 14th, 2011, Antoni Gurguí i Ferrer was the President of this Commission until the end of his term of office on October 2015. The Ministry of Industry, Energy and Tourism contributes to the activities of this Committee.

The role of the Commission on Safety Standards is to promote, monitor and control the CSN's standards programme. In 2015, the Commission on Safety Standards met again on May 7, 2015.

1.3. CSN Public Relations

1.3.1. Institutional Relations

Among its functions, the Nuclear Safety Council has been assigned to maintain official cooperation and advisory relations with public national institutions, institutions of autonomous communities and local ones, as well as professional and trade union organisations and non-governmental associations involved in nuclear safety and radiation protection.

Parliament

On June 29th of 2015, the 2014 Annual Report of the CSN was sent to the Congress of Deputies and the Senate.

In 2015, the Nuclear Safety Council did not record any direct questions from the Parliament groups, although different Members and Senators from the Ministry of Industry, Energy and Tourism did ask a total of nine questions and requests for information that made reference to issues related to nuclear safety and radiation protection.

The President of the CSN and other representatives shall appear before Parliament when requested by both chambers (Congress of Deputies and Senate) or at their own request. Throughout 2015, the President of the CSN did not appear before the Congress of Deputies.

The different Parliamentary groups, fulfilling their monitoring role, may request the Nuclear Safety Council information related to its performance in the field of nuclear safety and radiation protection. In 2015, two requests of this kind occurred.

Once the Commission of Industry, Energy and Tourism of the Congress of Deputies has revised the Annual Report of the CSN, it can resolve those matters of additional information and/or prompt the CSN to carry out specific actions.

Throughout 2015, the Nuclear Safety Council has continued to issue information relating to the 1st, 42nd, and 15th periodic resolutions, related to the activity reports of 2002, 2006 and 2007 respectively. The 1st and 42nd on a quarterly basis, and the 15th on a half-yearly basis. Similarly, the CSN has continued working during 2015 on those resolutions that require some type of activity corresponding to the report of the year 2013.

Government

As part of the exercise of its functions, the CSN maintains relationships with the Ministry of Industry, Energy and Tourism, the Ministry of Health, the Ministry of Public Works and Transport, the Ministry of Agriculture, Food and Environmental Affairs, the Ministry of the Interior and the Ministry of Defence. The activities carried out by the CSN are explained throughout this document.

Autonomous Communities

The Nuclear Safety Council can entrust the Autonomous Communities with performing functions assigned to it in accordance with the general criteria for the development of the Council itself. Throughout 2015, the document that details the general criteria has been revised and updated by the CSN.

Currently there are nine autonomous communities with which the CSN has function assignment agreements in place: Asturias, Balearic Islands, Canary Islands, Catalonia, Galicia, Murcia, Navarra, Basque Country and Valencia. With each one, a Joint Monitoring Committee is formed with representatives of the Autonomous Community and the CSN, chaired by the General Secretariat of the Council. These Committees gather at least once a year to monitor that the agreed-upon functions are performed properly.

The Assignment Agreements are subject to the audit plan established in the Management System of the CSN. Thus, throughout 2015, the Inspection Unit of the CSN monitored the Assignment Agreement established with the Autonomous Community of Catalonia.

Local Organisations

In terms of the institutional relations that the Nuclear Safety Council maintains with the public administrations, its participation in information committees in accordance with the provisions of Article 13 of the Regulation on Nuclear and Radioactive Facilities (RNRF), and its collaboration with the Association of Municipalities in Nuclear Power Areas (AMAC) stand out.

Universities

Regarding the relations with the university and academic world, by 2015 there were two main innovations: first, the establishment of the Chair of Nuclear Security Vicente Serradell at the Polytechnic University of Valencia and secondly, the Tenth Anniversary of the CSN chairs which was held at the headquarters of the CSN, with the assistance of the CSN, its President and its four Commissioners, and of the Rectors of universities with CSN chairs. On that day, it was highlighted that in the last ten years, over 200 trainees who finished their bachelor's and master's degrees, as well as 50 PhD trainees benefited from the CSN Nuclear Safety Chairs.

The purpose of the Chairs is to encourage the training of highly qualified technicians in nuclear safety and radiation protection, through their own curriculum, courses and active participation in related research projects.

1.3.2. International Relations

The CSN is responsible for collaborating with the Government in relation to international agreements on nuclear safety and radiation protection, relations with international organisations involved in these areas, and relations with the Council's counterparts, foreign regulatory bodies. This implies a wide spectrum of activities that may be classified under the following headings: multilateral relations, international agreements, and bilateral relations.

Multilateral Relations

European Union

Among the main treaties that are the foundation of the European Union is the Treaty establishing the European Atomic Energy Community (Euratom), addressing, among other topics, the basic regulatory framework in the field of nuclear safety and radiation protection. Due to its vital importance, activities and international initiatives that were created through the Euratom Treaty are of particular relevance to the CSN.

The CSN participates with the Minetur in the European Nuclear Safety Regulators Group (ENSREG), set up in 2007 to assess the EU Council, Parliament and Commission on matters of nuclear safety and safe management of radioactive waste. Within the scope of this partnership, the CSN has chaired Working Group 1 in charge of Nuclear Security (WG1) since 2014.

On the European level, the CSN participates in the definition, coordination and execution of projects in the technical field of regulatory assistance to nuclear safety authorities of third countries, which are funded by the Instrument for Nuclear Safety Cooperation (INSC) of the European Union. During 2015, the CSN completed its tasks under the development framework of the EU cooperation project, related to the development and strengthening of the capacities of the nuclear regulatory authority in Morocco and its Technical Support Organisation (TSO). The CSN continued with the work associated to the project of cooperation for the strengthening of the regulatory capacities of China's regulatory organisation and its TSO, which is scheduled for 2016.

On August 2015, Spain submitted its first national report on the implementation of the EU Council Directive 2011/70/Euratom of July 19th 2011, establishing a community framework to guarantee responsible and safe management of spent nuclear fuel and radioactive waste.

Atomic Questions Group (AQG)

The Atomic Questions Group (AQG) is the working group of the European Union Council, in charge of studying the matters covered by the Euratom Treaty.

In the first half of 2015, the CSN continued with the negotiation and coordination of positions of

the Euratom Community in relation to the Diplomatic Conference of the Convention on Nuclear Safety, held in February this year. Also, a review of the cooperation guide was undertaken to adopt a common position among Member States in the framework of international conventions on which the Euratom Community and its Member States are Contracting Parties.

In the second half of 2015, the AQG came to agree on two conclusions of the EU Council. The first one, adopted at the EU Council meeting on December 3rd, 2015, dealt with the justification of medical images involving exposure to ionising radiation. The second one, adopted at the EU Council meeting on December 15th, 2015, dealt with the preparation and response to off-site nuclear emergencies. The CSN participated in the analysis and negotiation of these documents with Minetur and the Ministry of Health.

In addition, the CSN has collaborated on activities organised by the EC to assist Member States in the transposition of Euratom Directives into their national legal systems.

European Nuclear Safety Regulators Group (ENSREG)

The European Nuclear Safety Regulators Group (ENSREG), is an independent advisory group that performs activities for the EU Council and Parliament. It is composed of the regulatory authorities of Member States' experts in the field of nuclear safety and management radioactive waste. The CSN cooperates with Minetur, in various activities.

On June 29th and 30th, 2015, ENSREG's third European Conference on Nuclear Safety was held in Brussels, Belgium. The CSN was part of the Organising Committee of the Conference, taking an active role in the analysis and development of the scientific and technical program.

Regulatory Assistance Activities

In the field of ENSREG, the work of the Working Group for International Cooperation (WG4) stands out. It tracks the assistance projects to third countries funded by the Instrument of Technical Cooperation for Nuclear Safety (INSC: Instrument for Nuclear Safety Cooperation), and the technical programme of these projects as prepared by the European Commission. The group's task is to assess the European Commission and to report on the most relevant aspects of assistance projects, evaluating the achievement of the objectives thereof and studying candidatures from potential beneficiary countries.

In 2015, the discussion and analysis in WG4 on the establishment of an action plan began to develop an interim report of the Instrument INSC for the period 2016-2017. This report should include an assessment of the INSC programs and projects, identify recommendations for possible changes in the Commission's Strategy for Cooperation in Nuclear Safety document, and recommend possible revisions of the INSC Regulation for the next period. The European Commission shall issue this report to the European Council and Parliament before December 2017.

The CSN takes part in several of the INSC projects promoted by the European Commission, with the aim of sharing experiences on regulations and strengthening the development of regulatory bodies in the beneficiary countries.

In 2015, the CSN has participated in the following assistance projects financed by the INSC:

- The INSC project for cooperation in the development and strengthening of the capacities of the Moroccan authority in nuclear regulation, which ended in March 2015.

- The INSC project to strengthen the capacities of the regulatory body of China and its technical

support organisation. The CSN has taken part in the implementation and development of this project, as part of a consortium of European regulatory bodies and support agencies.

4th ASEM Seminar on Nuclear Safety

On October 29th and 30th 2015, the 4th ASEM Seminar on Nuclear Safety was held in Madrid. It addressed the theme of 'Knowledge Management for the Implementation of Nuclear Safety' and developed the fundamental pillars of capacity building, such as the development of human resources, education and training, and the management of knowledge networks and self-knowledge. 110 participants from 27 countries attended the Seminar and it was an excellent opportunity to exchange ideas and experiences, and develop the possibilities for cooperation between institutions in Asia and Europe.

International Atomic Energy Agency (IAEA)

The International Atomic Energy Agency (IAEA) is an independent agency of the United Nations System with the mission to promote the contribution of nuclear energy to peace, health and prosperity throughout the world. One fundamental objective is the development and promotion of high safety and security standards in the peaceful uses of nuclear energy in its Member States, which is advocated through the development of recommended rules.

The CSN actively participates in IAEA activities, including participation in the bodies of the Agency, in committees and technical working groups in the field of technological safety and security, in scientific and technical meetings, and in international IAEA missions.

In 2015, contributions from the CSN amounted to 289,870 Euros, primarily intended to support the work programme of the Ibero-American Forum of Radiological and Nuclear Regulatory Bodies (FORO), to support several technical cooperation projects in the regions of Latin America and North Africa, and support technical programs and projects the CSN is interested in, such as those related to the storage of spent fuel, nuclear safety, and seismic safety of nuclear installations.

General Conference

The CSN participated in the IAEA General Conference, held in Vienna from September 14th to 18th in 2015.

The CSN supported the Ministry of Foreign Affairs and Cooperation (MAEC) in the drafting of the national declaration and met the IAEA General Director and the Nuclear Deputy Assistant Director-General of Nuclear Safety and Security .

Committees and Working Groups

In order to encourage the establishment of national security rules that would ensure a high level of nuclear safety and security at nuclear facilities and activities, the IAEA develops a recommended standard regulatory framework, revised on a continuous basis and agreed upon the international stage, which serves as a reference to its members in developing their own national framework States.

In order to coordinate and monitor all development activities and technical standard reviews, the IAEA has the Commission on Safety Standards (CSS), in which Counselor Antoni Gurguí participated as a national representative in the April meeting and Counselor Javier Dies in the November meeting.

In 2015, the CSN experts participated in meetings on knowledge management in regulatory bodies and technical support organisations, research and development in light of the Fukushima accident, and the mitigation of severe accidents by improving the filtered venting systems of the containment of water cooled reactors, to name a few of the most relevant issues. In the area of ??technical cooperation, the CSN was invited by the IAEA to

participate in the planning and coordination of various projects to which it contributes financially. The CSN also participated and coordinated Spain's contribution in the drafting or revision of standards, guidelines, and other technical documents of the IAEA, in its field of competence.

IAEA International Missions

The IAEA coordinates international missions to assess compliance with standards, requirements or best practices in the field of nuclear safety, radiation protection and security in member countries. The CSN supports the development of peer review missions to other countries with the participation in the review teams of experts from the CSN Corps of Nuclear Safety and Radiation Protection, at the request of the IAEA. In 2015, the CSN contributed to the IRRS mission in Ireland, participating in multiple expert-training courses and process-improvement workshops, which are common in such missions.

Other international organisations

The CSN is a member of several associations of regulators, built on a common will to cooperate in order to address global issues and challenges for the regulatory policy, and to identify and look for opportunities to improve the regulation of nuclear safety, radiation protection and security.

International Nuclear Regulators Association (INRA)

In 2015, the President of the CSN participated in the meetings of INRA, an association that brings together the regulatory agencies with the most experience in the field of nuclear regulation (Germany, Canada, South Korea, Spain, United States, France, United Kingdom, Japan and Sweden).

Western European Nuclear Regulators Association (WENRA)

In 2015, the CSN organised and hosted the autumn session of the Plenary of the WENRA, between October 26th and 28th, 2015.

Ibero-American Forum of Radiological and Nuclear Regulatory Bodies (FORO)

In 2015, this Forum held its annual meeting in Lima, which was attended by the CSN. Two new projects were approved in this meeting: one for the exemption of small quantities of waste in medical facilities and the second for the use of the risk-matrix method in industrial installations.

Heads of European Radiological Protection Competent Authorities (HERCA)

The aim of this association is to analyse the practical implementation of European directives and regulations on radiation protection, in order to promote harmonised working practices. The CSN participates in meetings of the Plenary group HERCA as well as in its working groups.

European Nuclear Safety Regulators Association (ENSRA)

The CSN participates in the European Nuclear Safety Regulators Association (ENSRA), which was created due to the interest of the partners themselves as a forum for the secure exchange of information and experiences on the implementation of different physical protection practices in nuclear power plants and other nuclear facilities.

International conventions of the International Atomic Energy Agency (IAEA)

Convention on Nuclear Safety

During the sixth review meeting of the Convention on Nuclear Safety, held from March 24th to April 4th in 2014, the Contracting Parties present and voting decided to carry out a Diplomatic Conference within the period of one year, to consider the amendment proposed by Switzerland in Article 18 of the Convention. It was held on February 9th, 2015, at the IAEA headquarters in Vienna. The result was the adoption of the Vienna Declaration on Nuclear Safety.

In October 2015, an organizational meeting for the Convention on Nuclear Safety's seventh review meeting was held, where matters relating to the operation of the review meeting to be held during 2017 were discussed and agreed on.

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

In May 2015, a delegate from the CSN participated in the fifth Review Meeting of the Contracting Parties to the Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management. The Spanish delegation presented the fifth report showing national compliance with the commitments arising from the Joint Convention. In this fifth review meeting, they highlighted the progress made since the previous cycle of the convention with regards to the management of radioactive waste, spent fuel and disused sealed sources. Means were discussed to encourage adherence to the Joint Convention, to actively participate in the peer review process, and to increase the effectiveness of the review procedure for the Contracting Parties that have no nuclear power programs.

Convention for the Protection of the Marine Environment of the North-East Atlantic (OSPAR)

The CSN participates as a representative of Spain in the OSPAR Convention's Radioactive Substances Committee (RSC). Topics discussed in this committee include those related to facilities and activities, nuclear and non-nuclear (radioactive NORM industries and installations), that may lead to radioactive discharges into the Atlantic Ocean, either directly or through river basins. In 2015, the CSN attended the RSC meeting held from February 10th to 12th in Germany.

Bilateral relations

The CSN has signed several bilateral agreements for technical cooperation, aiming to lay the foundation for collaboration and exchange of technical information, and regulatory expertise. In specific cases, the CSN has also signed cooperation agreements in specific areas, such as agreements on R&D with the US regulatory agency, or preparation and management of the nuclear emergency response regulator with France.

Throughout 2015, the existing close cooperation with regulators from the United States and France through numerous joint activities to institutional and technical levels does still remain the same. Bilateral relations with countries of geo-strategic interest in the regions of the Middle East and Latin America, and Sweden, Poland and Portugal have also been promoted.

The United States of America

The framework for the exchange of technical information and cooperation in nuclear safety agreement between the Nuclear Regulatory Commission of the United States (NRC) and the Nuclear Safety Council was renewed in October 2015.

In 2015, the CSN participated in the Regulatory Information Conference (RIC), organised by the NRC to make their lines of action public. It has been one of the major events in the field of nuclear regulation.

France

On March 5th, 2015, the bilateral meeting between the Nuclear Safety Authority (ASN) and the CSN took place at the headquarters of the ASN in Paris. This meeting reviewed and discussed the changes made at the regulatory and legislative level in both organisations, and technical issues of common concern.

On September 22nd, 2015, the CSN experts participated as observers in an emergency drill at the Civauz Nuclear Power Plant organised by the ASN, where they learned in depth the ASN's procedures for emergency communication with the

public and media . From 6th to 8th of October 2015, a group of experts from the ASN visited the CSN headquarters in Madrid, to participate in a joint inspection of medical radiology, radiotherapy and nuclear medicine installations.

Portugal

In 2015, a technical cooperation protocol was started with the Ministry of Environment, Spatial Planning and Energy, the Ministry of Education and Science and the Ministry of Internal Administration of the Republic of Portugal, in the field of nuclear and radiological emergencies and environmental radiation protection.

Poland

Between the 15th and 16th of April 2015, the CSN hosted a bilateral meeting with representatives of the Agency of Nuclear Energy (PAA), in order to review technical and institutional issues of mutual interest and discuss priority lines for future bilateral cooperation.

Sweden

An invitation from the Swedish regulator was accepted and a visit was paid to Sweden in order to understand the licensing work of future spent fuel storage facilities, visit the Aspö laboratory, a pilot model for deep geological storage, and the temporary storage site CLAB.

1.3.3. Public Information and Communication

Web and Communication

Article 2 (ñ) of Act 15/1980 of 22 April, by which the Nuclear Safety Council was created, establishes the obligation to inform the public on matters within its competence with an extension and periodicity as the Council may decide, notwithstanding the publicity of its administrative performances as legally established, all providing the transparency and credibility of the CSN in the exercise of their functions.

Throughout 2015, a total of 110 briefing notes were issued. These included the incidents registered in nuclear and radioactive facilities, the main agreements of the Plenary, the most significant CSN actions in institutional and international arenas, as well as the prescriptive exercises simulated in terms of emergencies that are developed each year. There were 49 notes and reviews related to reportable events published on the external website (www.csn.es).

The CSN replied to 183 direct inquiries carried out by the media.

The processes of licensing the nuclear facility of the Centralised Temporary Storage (ATC) of spent nuclear fuel and high-level radioactive waste.

The project of modernisation and expansion of the Network of Environmental Radiological Surveillance Stations (REA) in the national territory, which will the number of stations from 25 to 200, aroused great interest in the media during November of 2015.

By 2015, participation in discussions, lectures and seminars, to get information to the public and the stakeholders of the surroundings of the Spanish power plants remains steady.

Also, the institutional website of the CSN was completely remodelled in order to be an important channel within an integrated model of information and communication to the public, thus meeting the objectives set in the new Act 19/2013, of December 9th, about transparency, access to public information and good governance.

Public Information

One of the challenges the CSN faces is how to make information accessible to society and

maintain a proactive policy, using all means and tools available to reach the public directly. The following channels were used:

- Publishing

  During 2015, according to the Publication Plan, a total of 21 new titles were published in on paper (books, Alpha magazine, standards, brochures and posters) with a circulation of five publications and 22,969 copies in electronic format (1,900 copies). Nine titles were reprinted with 21,880 copies that were distributed mostly in the information centre, as well as in various congresses.

- Publications distribution: 50,724 copies:

  – Internal distribution: 3,883.

  – External distribution: 13,689.

  – Fairs, congresses and conferences: 8,481.

  – Information Centre: 24,671.

- Information Centre

  The Information Centre had 308 visits throughout the year, with a total of 7,070 visitors. Of these, 6,855 belonged to schools, 188 from different institutions, and 27 individuals.

  As usual, in the month of November of 2015, the CSN collaborated with the Community of Madrid in the open day held every year within the week of science activities, receiving visits from groups and individuals interested in learning about the activities of the Council.

Other Activities

In 2015, the CSN has been present in:

- The 4th Joint Congress of the Spanish companies of medical physics and radiation protection, held from June 23th to 26th in Valencia.

- The 41st Meeting of the Spanish Nuclear Society, held from September 23rd to 25th in La Coruña.

- The 4th seminar of Nuclear safety of ASEM (Asia-Europe Meeting), held on October 29th and 30th in Madrid.

1.4. Advisory Committee for Public Information and Participation

The Advisory Committee for Public Participation and Information on Nuclear Safety and Radiation Protection was established under Article 15 of the Law 15/1980, of which the Nuclear Safety Council was created, with the mission to issue recommendations to the CSN promoting and improving the transparency, access to information, and public participation in matters within the competence of the CSN.

It consists of representatives of civil society, business, trade unions and public administrations, on a local, regional, and national scale.

On June 25th, 2015, the ninth meeting was held in which there were presentations on 'The Integrated Plant Supervision System (SISC) and the Results of its Implementation' and 'Natural Radiation'.

2. Strategies and Management of Resources

2.1. Strategic plan

In 2011, the Nuclear Safety Council approved the 2011-2016 Strategic Plan, which represents their commitment to society for the coming years in relation to the preservation of the nuclear and radiation safety in Spain.

The Strategic Plan is developed in Annual Work Plans (PAT), which are approved by the Council and include the operational objectives and the most significant activities to be carried out each year, as well as indicators or numerical goals.

The 2015 PAT defined objectives and activities to be carried out by the CSN throughout the year, the global planning of working tasks, the details of the activities carried out in each facility, inspection plans, regulations program, procedures program, the audit programme and R&D projects.

The PAT tracking reports incorporate results of the indicators reflected in the Strategic Plan. As a monitoring mechanism, the Annual Work Plan has a control panel that contains the numerical values of nineteen indicators established for monitoring the most significant activities of the PAT. These values are compared with the previously set objectives. The values of control by the year 2015 reflect a degree of compliance next to the annual objectives.

2.2. Management system

Procedures and Internal Audits

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

The management system implemented in the CSN requires that the entire organisation is subject to a process of continuous improvement. In addition to the evaluations to ensure that plans and objectives are being met, the CSN has established an internal audit plan and is assessed systematically through external evaluations performed by national and international agencies.

In 2015, 38 procedures have been edited or revised, of which four are management, 23 are administrative and ten are technical.

Throughout the year, the basic internal audit plan has continued by being divided into two parts: one for the activities of the CSN, and another for the tasks entrusted to the Autonomous Communities. Audits have been conducted in four processes and in an Autonomous Community. The results of audits have made it possible to identify non-conformities related to the management system and its procedures, none of which were related to safety.

Training Plan

In 2015, the Training Plan was structured in seven programmes, one of them subdivided into four: Technician Training for Improving and Recycling (with sub-programmes nuclear safety, radiation protection, support and initial technical training), Executive Development, Administrative Management, Prevention, Computing, Languages, and Skills. The Plan has been carried out according to the educational proposals of the various organisational units.

The average number of activities taken by those who attended was 2.62 activities per person.

The overall number of hours dedicated to the training of the staff was 44,888, with a total cost of 430,168.59 Euros.

As usual the participation of the CSN has been promoted in national and international conferences, meetings, seminars, etc.

2.3 Research and development

The four-year R&D Plan set the objectives of the R&D performed by the CSN, and identifies the lines of technical work that are considered adequate to address. In addition, the Plan also contains objectives for the good development of the same.

The accident at the Fukushima Dai-ichi nuclear power plant in March 2011 had a deep impact on the world of nuclear safety and radiation protection. Throughout 2015, the CSN continued to participate in international R&D in relation to this accident. The draught Benchmark Study of the Accident at the Fukushima Dai-ichi Nuclear Power Plant (BSAF) should be noted in particular. There have also been agreements with different national bodies to carry out analysis and R&D activities that allow a better assessment of accident and its implications, as well as resulting lessons.

Throughout 2015, a total of 51 projects of R&D have been managed, starting with a total of seven projects of R&D and twelve completed projects, including partnerships with national institutions (like universities and Ciemat) and international (Nuclear Energy Agency of the OECD and the US Nuclear Regulatory Commission), as well as five projects funded through the public announcement made in 2012.

In addition, the CSN continues to perform as it is stated under the Resolution 2 of the Congress of Deputies in connection with the 2012 Annual Report of the CSN, which demands 'that through the CSN trials in R&D between schools and universities and technological centres for a better understanding of the behaviour of degradation phenomena not foreseen initially'. In relation to this Resolution, the CSN has continued the development of the Working Group on Degradation of Materials, in the context of the technological R&D platform CEIDEN in energy and nuclear safety issues, involving the CSN and the majority of organisations involved in R&D in these fields.

The budget for R&D during the 2015 period was 2,960,030 Euros. In order to improve the process of transparency and the quality assurance of the R&D Plan, the CSN has developed internal procedures for the optimisation, management and technical assessment of projects' results.

2.4. Resources and media

2.4.1. Human Resources

By 31st December 2015, the total number of staff in the Council amounted to 451, as detailed in table 2.4.1.1.

The Royal Decree 196/2015, of March 22nd, approved the offer of public employment for 2015 offering twenty positions for the Upper Management of the Nuclear Safety and Radiation Protection.

Under the Resolution of November 30th, 2015, the President of the Nuclear Safety Council appointed six new open shift posts for civil servants, and one post for internal promotion of the Upper Management of the CSN. These post corresponded to the offer of public employment in the previous year.

In its tenth application, a survey recognising the experience of the civil servants working in the

Table 2.4.1.1. Distribution of Nuclear Safety Council staff until December 31st, 2015

	Council	General Secretariat	Technical Divisions	Total
Senior positions	5	1	2	8
Nuclear Safety and Radiological Protection Civil Servants	7	16	186	209
Other Public Administrations Civil Servants	7	98	36	141
Temporary staff	26	–	–	26
In-house staff	2	46	19	67
Totales	47	161	243	451

In-house staff	
Total	67
Single labour agreement	65
Non-pay scale	2

CSN was carried out on October 1st, 2015, and 31 civil servants were affected.

The number of women working in the Nuclear Safety Council represents 52% of the total workforce and men represent 48%.

The average age of personnel is 53 years old. The qualifications of the staff providing services in the CSN are: post-graduates (68.96%), graduates (6.21%) and others (24.83%).

The Plenary of the Council is working on developing a knowledge management model, with the objective of improving human resources, as well as promoting the processes described.

2.4.2. Economic Resources

With regards to economic and financial matters, the CSN is governed by the provisions of the General Budgeting Act, Law 47/2003, November 26th, inasmuch as it is an organisation included in the state public administrative sector in the terms established in articles 2.1.g and 3.b.1. Consequently, it is subject to the public accountancy system and the Accounting Instruction for the State Institutional Administration.

Economic aspects are broken down into budgeting items and financial items, the accounting of the Organisation complying with the requirements of the General public accounting plan (Order EHA / 1037/2010 of 13 April).

Budgeting items

The initial budget of the CSN for the financial year 2015 amounted to 46,507 thousand Euros. This total initial budget was not modified throughout the year.

Regarding income, as a result of the revenue management, the recognised net assets amounted to 44,757 thousand euros, being 44,115 thousand euros (99.9%) of non-financial transactions. Of the total of the recognised net assets, 43,478 thousand euros correspond to Chapter III (rates, public

Table 2.4.2.1. Initial and Final Budgets for 2014 and 2015 (Euros)

Budget	Exercise 2014	Exercise 2015	Change %
Initial budget	46,611,640.00	46,507,130.00	-0.22
Final budget	46,730,390.00	46,507,130.00	-0.48

prices and other income) on the final forecast of 45,949 thousand euros, representing an execution of 94.62%.

The recognised net assets amount in current transfers is 400 thousand euros representing an execution of 100.00% on a final forecast of 400 thousand euros. Of the recognised assets, no amount has been deposited since the whole is being retained by the Treasury.

On the other hand, the net assets deposited reached an amount of 43,277, thousand euros, of which 43,055 thousand euros corresponded to Chapter III 'Fees and Other Income', 99.49% compared to total net income and 93.70% compared to the budget estimation of said Chapter.

Regarding the expenses, the commitments undertaken amount to 41,142 thousand euros accounted for 88.47% of the final budget appropriations. The total liabilities recognised amounted to the sum of 33,084 thousand euros, representing 86.72% of the final budget of 46,507 thousand euros.

Financial Aspects

The income statement reflects expenses and revenues, classified by economic nature, occurring as a result of budgetary and non-budgetary transactions carried out by the CSN in a given period.

Personnel expenses accounted for 60.86% of the total. Personnel expenses include salaries and wages, social security paid by the employer, and social welfare costs contributions. In second place were external services, with 30.8%, fundamentally composed of the services of independent professionals, maintenance expenses, and communications. In third place, the depreciation and amortisation charge (3.79%). In fourth place, the transfers and subsidies for nuclear safety and radiological protection, post-graduate scholarships, and international transfers (1.76%). And finally, other expenses with no representation include taxes, financial expenses, other regular management costs, and impairment of financial assets.

As for income, the rates for services rendered were the main source of funding for the CSN, representing 96.79% of the total, with the remaining 3.21% received from current transfers and subsidies, financial income, and other management income.

The result for the financial year was a positive balance of 4,443 thousand euros.

2.4.3. Computer Resources

In 2015, the expansion of the electronic signature process and applications for internal information related to time control, and training activities and service fees continued to be improved. The Nuclear Installations and Radiation Facilities management applications are the core of the information system. These applications featured the electronic signature process and panels through which interested parties can send all types of documents, or inquire about the status of their applications. The risk analysis and risk management plan have been updated under the

requirements defined in the National Insurance Scheme. The Plenary has approved the Business Continuity Plan. Its aim is to describe the management of activities by the CSN in defined situations of crisis or disaster, taking into account the security requirements of information that supports the organisation's critical processes, the measures to be taken to ensure continuity, and information processed by the CSN.

Constant Improvement

In the chapter on systems, the projects that stand out are: the continued installation of the CSN security network infrastructure in the Sub-Directorate General of Emergencies and Security, for the management of information classified as confidential; the continued operation of the current contingency centre (an alternative, redundant and external centre) and the creation of a new centre, whose public contract has been awarded to another company providing that service.

The CSN is engaged in a continuous process of technological innovation, ranging from the renewal of services and applications in the Emergency Room, also known as B3CN group, to the introduction of new authentication and signature methods beyond the digital certification, to optimising the content management and flow of technical and administrative digital work, to the use of cloud computing and the periodic testing of proper functioning of communications systems emergency network, also called N Network.

Chapter II. Report on Activities

3. Overview of nuclear safety and radiation protection in 2015

Overall assessment of the Nuclear Safety and Radiation Protection Facility in 2015

The overall evaluation of nuclear power plant operation is carried out by considering the results of the Integrated Plant Supervision System (SISC) and the inspection, supervision and control of radioactive facilities; the reported events, especially those classified on the International Nuclear Events Scale of the IEAEA (INES scale) at a level higher than zero; the radiological impact; the dosimetry of the workers; the relevant modifications considered, warnings and sanctions issues; and operating events.

All nuclear plants have operated safely throughout 2015.

At the end of 2015, all performance indicators of the Integrated Nuclear Supervision (SISC) were in green and no inspection finding surpassed the category of green. The plants have been in the situation of normality, with application of standard inspection programs and correcting deficiencies, a situation called 'licensee response' in the action matrix of SISC. The only exception has been the unit II of Almaraz that remained in the regulatory response column in the third and fourth quarters of 2015.

Meanwhile, radioactive facilities have continued to operate according to the established safety standards, with no situations of undue risk.

Environmental quality around the facility has been maintained in acceptable conditions from the radiological point of view, without any risk to people engaged in operation, decommissioning or closure activities.

3.1. Safety of the facilities

3.1.1. Nuclear power plants

The SISC is currently the main instrument for assessing the behaviour of nuclear power plants in terms of security, the monitoring effort planning, the CSN control, and the communication to the public for both issues.

The Table 3.1.1.1 shows the status of the action matrix corresponding to 2015, in which all operating power plants have been in 'holder response' mode, except Almaraz Unit II which remained in the licensee response column in the third and fourth quarters of 2015. In Table 3.1.1.2, the characteristics of the different modes of action matrix are described.

Table 3.1.1.1. Status of action matrix. SISC 2015

	1st quarter	2nd quarter	3rd quarter	4th quarter
Almaraz I	LR	LR	LR	LR
Almaraz II	LR	LR	RR	RR
Ascó I	LR	LR	LR	LR
Ascó II	LR	LR	LR	LR
Cofrentes	LR	LR	LR	LR
Trillo	LR	LR	LR	LR
Vandellós II	LR	LR	LR	LR

LR: licensee response. RR: regulatory response.

Table 3.1.1.2. Analysis of action matrix. SISC 2015

Modes	Basis	Derived actions
Licensee response	A plant is in this column when all the assessment of the results are *green*.	The CSN will perform only the basic inspection programme and any deficiencies identified will be dealt with by the licensee as part of the latter's corrective actions programme.
Regulatory response	A plant is in this column when one or two results, either operation indicator or inspection finding, are *white* on different safety pillars and there are no more than two *whites* in any strategic area.	The licensee shall perform an analysis to determine the root cause and contributing factors, and include the activities required to solve the deficiencies detected in his corrective actions programme. The assessment performed by the licensee shall be subjected to a supplementary inspection by the CSN. Following this inspection, the CSN will meet with the licensee to analyse the deficiency detected and the actions implemented to correct the situation.
One pillar degraded	A pillar is considered to be degraded when it contains two or more white results or one yellow. A plant is in this column when it has a degraded pillar or three white results in a strategic area.	The licensee shall perform an analysis to determine the root cause and contributing factors and include the activities required to solve the deficiencies detected in his corrective actions programme, as regards both the problems identified in each subject area and whatever overall collective deficiencies and problems might arise. The assessment performed by the licensee shall be subjected to a supplementary inspection by the CSN. Following this inspection, the CSN will meet with the licensee to analyse the deficiency detected and the actions implemented to correct the situation.
Multiple degradations	A plant is in this column when it has several degraded pillars, several yellow results or one red result, or when a pillar has been degraded for five or more consecutive quarters.	The licensee shall perform an analysis to determine the root cause and contributing factors and include the activities required to solve the deficiencies detected in his corrective actions programme, as regards both the problems identified in each subject area and whatever overall collective deficiencies and problems might arise. This assessment may be performed by a third party, independent from the licensee. The CSN shall perform a supplementary inspection to determine the amplitude and depth of the deficiencies. Following this inspection, the CSN will decide whether supplementary actions are required (supplementary inspections, request for additional information, issuing of instructions and/or shutdown of the plant).
Unacceptable operation	The Council declares a plant to be in this situation when there is insufficient guarantee that the licensee is capable of operating the facility without causing an unacceptable risk.	The CSN will meet with the management of the licensee to discuss the degradation observed in operation and the actions to be taken before the plant can restart. The CSN will draw up a specific supervision plan.

The CSN website has a specific link to the SISC (www.csn.es/sisc/index.do), which includes the results of the system and supporting operational information for all the nuclear power plants updated every three months, along with descriptive documentation and corresponding procedures.

Reported Events, Proposals for Sanctions, Proceedings and Warnings

In application of the contents of Council Instruction IS-10, which establishes the criteria for the reporting of events to the Council, the nuclear power plant licensees reported 55 events in total in 2015. Two were classified on level 1 on the International Nuclear Events Scale (INES) and the remaining 53 on level 0. The events classified on level 1 were caused by the noncompliance of the surveillance rounds of fire protection, in the Almaraz I and II power plant units.

Of the 55 events reported, the CSN Incident Review Panel (PRI) classified 20 as significant, and five of these as both significant and generic. An event is classified as significant if subsequent tracking of the corrective measures implemented is considered necessary, or if it may lead to requests for the adoption of additional measures to those proposed by the licensee because of its safety significance. An event is considered generic when its causes are determined to be translatable to other nuclear facilities.

On October 28th 2015, the CSN propositioned the Ministry of Industry, Energy and Tourism to create a sanction proceeding for the licensees of the Almaraz nuclear power plant due to the noncompliance with the ETF 3/4.7.12 and the CSN Instruction IS-10, in which the reporting of incidents criteria from the power plants to the CSN is established.

3.1.2. Juzbado fuel assembly manufacturing facility

Overall, the Juzbado manufacturing facility operated suitably from the point of view of safety and managed the reportable events that occurred correctly, performing the appropriate analyses and applying the corrective actions arising therefrom.

In 2015, there were four reportable events listed below, which have not posed a risk to the workers, the public or the environment.

- On January 3rd 2015, the critical alarm system (SAC) was activated, however it was a false alarm.
- On January 14th 2015, the critical alarm system (SAC) was activated, however it was a false alarm. The cause was a human error.
- On August 4th 2015, there was a false alarm of the SAC as a result of a power failure of one of the Data Acquisition Modules (DAM).
- On October 19, 2015, there was a reportable event in 24h due to not carrying out the surveillance requirement of the P-RV-11.3.4.2. 'Quarterly checking of the electric batteries' applied to the CSLA-1, 2 and 3 switchboards' batteries.

The CSN has not had to institute any disciplinary proceedings and has not issued warnings to this installation.

3.1.3. El Cabril waste disposal facility

The supervision and monitoring system of the El Cabril Storage Centre (SSSC) has established biennial frequency. In 2013, it designed the monitoring programme which became operational in 2014.

The results obtained on indicators of the installation operation are part of the areas of emergency preparedness, operational radiation protection and radiation protection to the public. From the calculation of performance indicators

during 2015, it follows that all are located in the category of Normal Operation, except for the one corresponding to the response when faced with drills and emergency situations that required intensification of surveillance in the area.

After the monitoring and control of operations, the periodic assessment reports submitted by the facilities, and the inspections by the CSN, it is concluded that the activities were conducted in accordance with the limits and conditions established in the operating permit and current legislation.

During 2015 there has been no reportable event at the facility.

The CSN has not had to institute any disciplinary proceedings or has not issued warnings to this installation.

3.1.4. Research Centre on Energy, Environment and Transports (Ciemat)

Ciemat has an authorisation to operate as a single nuclear installation.

In the catalogue of facilities that make up the centre, there are two different groups: one that includes centres currently stopped, being dismantled for closure or already closed, and another group consisting of 21 operating second and third radioactive facilities.

The decommissioning project (PIMIC-Decommissioning) affects the area that housed the most representative nuclear facilities in the former Nuclear Energy Board (JEN) ??executed by Enresa.

In 2015, almost all of the phases of decommissioning were completed and the disposal of solid radioactive waste to the temporary storage of El Cabril has continued.

During 2015 there have been no events of note at the facility.

The CSN has not proposed to institute disciplinary proceedings, neither has it issued warnings to this facility.

On December 31st 2015, the temporary storage of radioactive waste had an occupancy rate of 42.39%.

3.1.5. Facilities in the definitive shutdown, dismantling or decommissioning phase

The following nuclear or radioactive fuel cycle facilities have ceased operation or are in the process of dismantling and decommissioning: Vandellós I (in the dormancy stage after the conclusion of the first stage of decommissioning), Jose Cabrera Nuclear Power Plant (in the dismantling stage), Elefante uranium concentrate plant (dismantled and in the period of compliance), Quercus Plant (in the final shutdown; the request for decommissioning and closure has been presented in 2015) and Andujar uranium mill (dismantled and in the period of compliance).

Throughout 2015, the activities of each phase carried out at each of the facilities in their respective statuses were under the established safety limits and had no undue impact on either persons or the environment.

3.1.6. Radioactive facilities

Throughout 2015, the operation of the radioactive facilities for scientific, medical, agricultural, commercial, and industrial purposes was performed in accordance with safety standards. The measures in place to ensure the radiological protection of persons and the environment were adhered to and, as a result, there were no situations of undue risk.

3.2. Application of the radiological protection system

3.2.1. Summary of dosimetry data

In 2015, there were 108,184 workers affected by dosimetry, with a collective average dose of 18,297 msv/person and an individual average dose of 0.76 mSv/year. This represents 1.52% of the maximum annual dose established in the legislation.

Two cases of potential improvement in the annual dose limit established in legislation, all of them in radioactive facilities, were recorded during the year 2015. In both cases, a process of investigation was initiated and has not yet been completed. The following may be underlined:

- The medical radioactive facilities showed the highest collective dose (10,756 msv/person), a logical outcome in view of the fact that these are the installations with the largest number of professionally exposed workers (84,423).

- The facilities in the dismantling phase registered the highest average individual dose (2.15 mSv/year), corresponding to the doses registered during the dismantling of the José Cabrera nuclear power plant (see 4.4.2.f).

- The operating nuclear power plants had 9,762 dosimetrically-monitored workers with a collective average dose of 4,863 msv/person and an individual average dose of 1.34 mSv/year.

3.2.2. Control of releases and environmental radiological surveillance

The CSN carries out an environmental radiological surveillance programme throughout the national territory, outside the areas of influence of the facilities, in order to watch over and maintain the radiological quality of the environment across the country and in-keeping with the requirements of the Euratom Treaty.

Control of releases and environmental radiological surveillance around the facilities

In response to a CSN requirement, the nuclear power plants have established a programme aimed at controlling radioactive effluents and keeping doses to the public as low as possible, in all cases below the values established by the Regulation on the Protection of Health against Ionising Radiations.

The radioactive effluents from the Spanish nuclear power plants have followed a stable trend in recent years, as shown in figures 3.2.2.1 to 3.2.2.4.

Figure 3.2.2.1. Liquid radioactive effluents of PWR plants. Normalised activity (GBq/GWh)

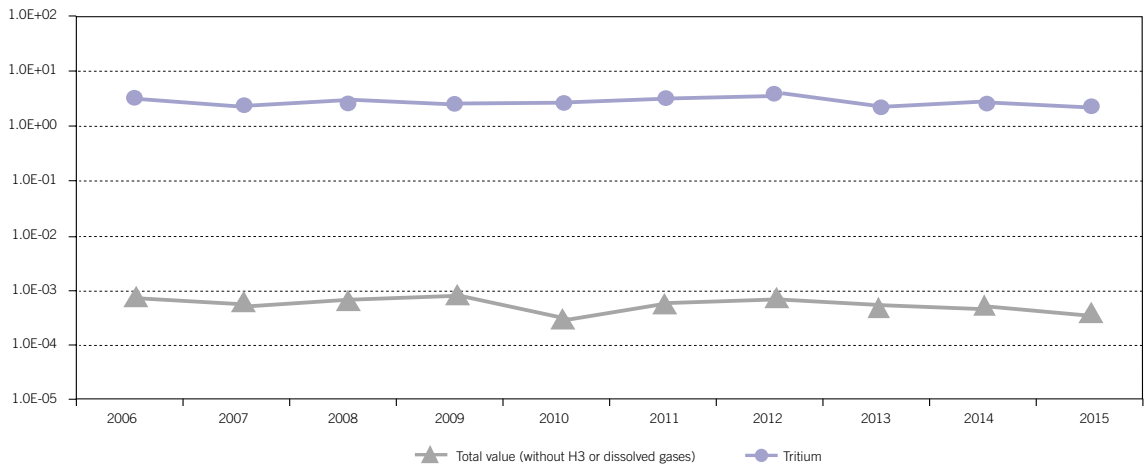


Figure 3.2.2.2. Gaseous radioactive effluents from PWR plants. Normalised activity (GBq/GWh)

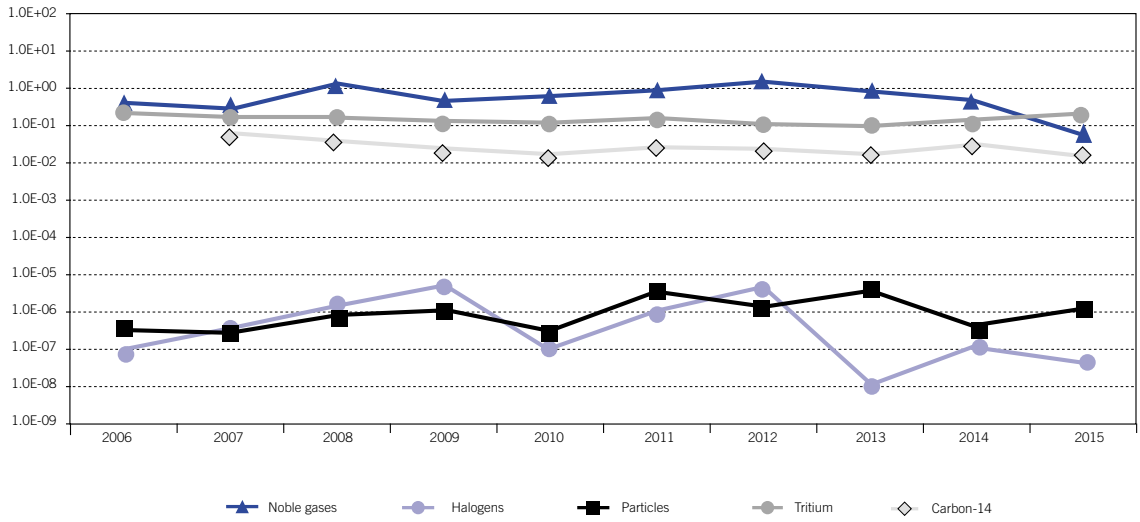


Figure 3.2.2.3. Liquid radioactive effluents from BWR plants. Normalised activity (GBq/GWh)

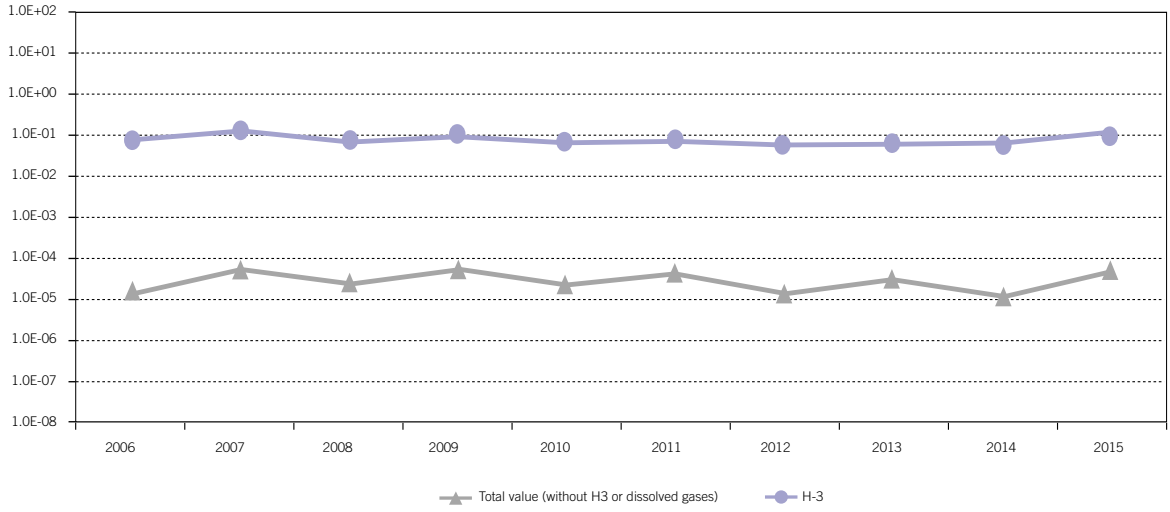
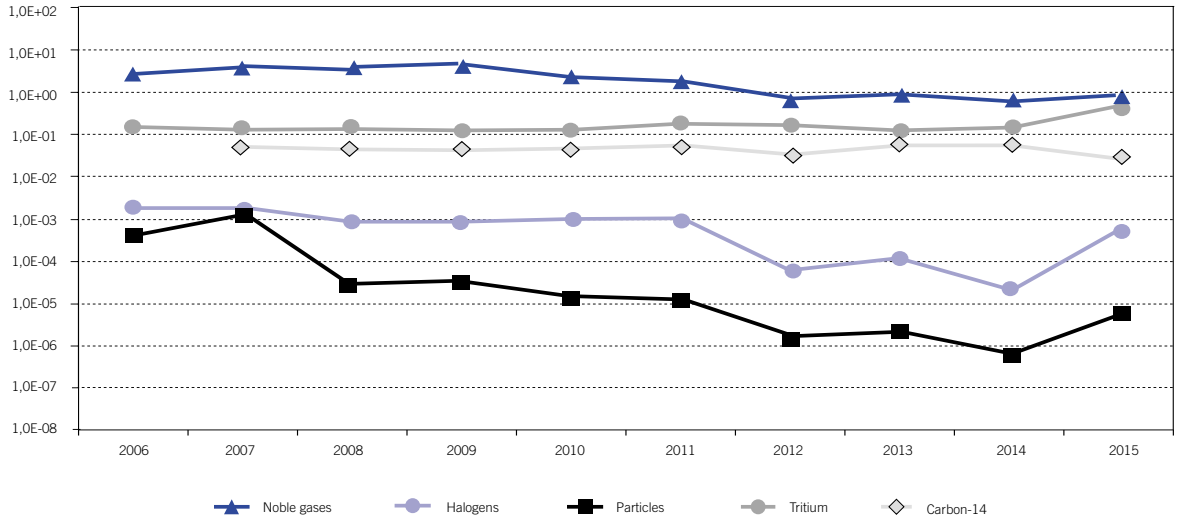


Figure 3.2.2.4. Gaseous radioactive effluents from BWR plants. Normalised activity (GBq/GWh)



With a conservative approach, the effective dose estimation due to the emission of gaseous and liquid radioactive effluents for the most exposed individual in a critical group has not exceeded 4% of the authorised limit (0.1 mSv in 12 consecutive months). In order to verify the suitability of programmes for the monitoring and control of radioactive effluents and models of transfer of radionuclides in the environment, programs of environmental monitoring are established in the vicinity of the operating nuclear power plants, fuel cycle installations and facilities that currently are in the stage of dismantling or closing.

This report presents the results of the environmental radiological surveillance programmes (ERSPs) for the year 2014. This is the result of the processing and analysis of samples that do not allow inclusion of the 2015 campaign.

The licensees of the facilities are responsible for carrying out these monitoring programmes. During 2014, 6,358 samples were taken in the areas surrounding the nuclear power plants, 2,013 around the fuel cycle facilities (the Juzbado fuel assembly manufacturing facility, the El Cabril plant, the Quercus plant, and the mining operations carried out by in Enusa) and 1,936 at installations in the dismantling and decommissioning stage, including Ciemat, the José Cabrera and Vandellós I nuclear power plants, the Andújar uranium mill, and the now decommissioned Lobo-G plant.

The results of the ERSPs of the 2014 campaign were similar to those of previous years and made it possible to conclude that the quality of the environment around the facilities remained in acceptable conditions from the radiological point of view, without there being any risk for persons as a result of their operation, or of dismantling and decommissioning activities carried out.

In order to verify that the surveillance programmes carried out by the facilities are correct, the CSN implements independent environmental radiological surveillance programmes (INERSPs), the sample volume and determinations of which represent around 5% of those performed by the licensees.

The results of these programmes, corresponding to the 2014 campaign, did not show any significant

deviations with respect to those obtained in the corresponding programmes of the licensees.

Environmental surveillance outside the area of the facilities

The Nuclear Safety Council undertakes environmental surveillance nationwide in collaboration with other institutions, through a surveillance network known as Revira. This network consists of automatic stations for the continuous measurement of atmospheric radioactivity (ASN) and stations where samples are taken for subsequent analysis.

Automatic stations network (ASN)

Figure 3.2.2.5 (ASN) shows the average annual gamma dose rate values, measured at each station of the CSN networks and the Regional Governments of Valencia, the Basque Country, and Catalonia and Extremadura stations where the dose rate values are also measured.

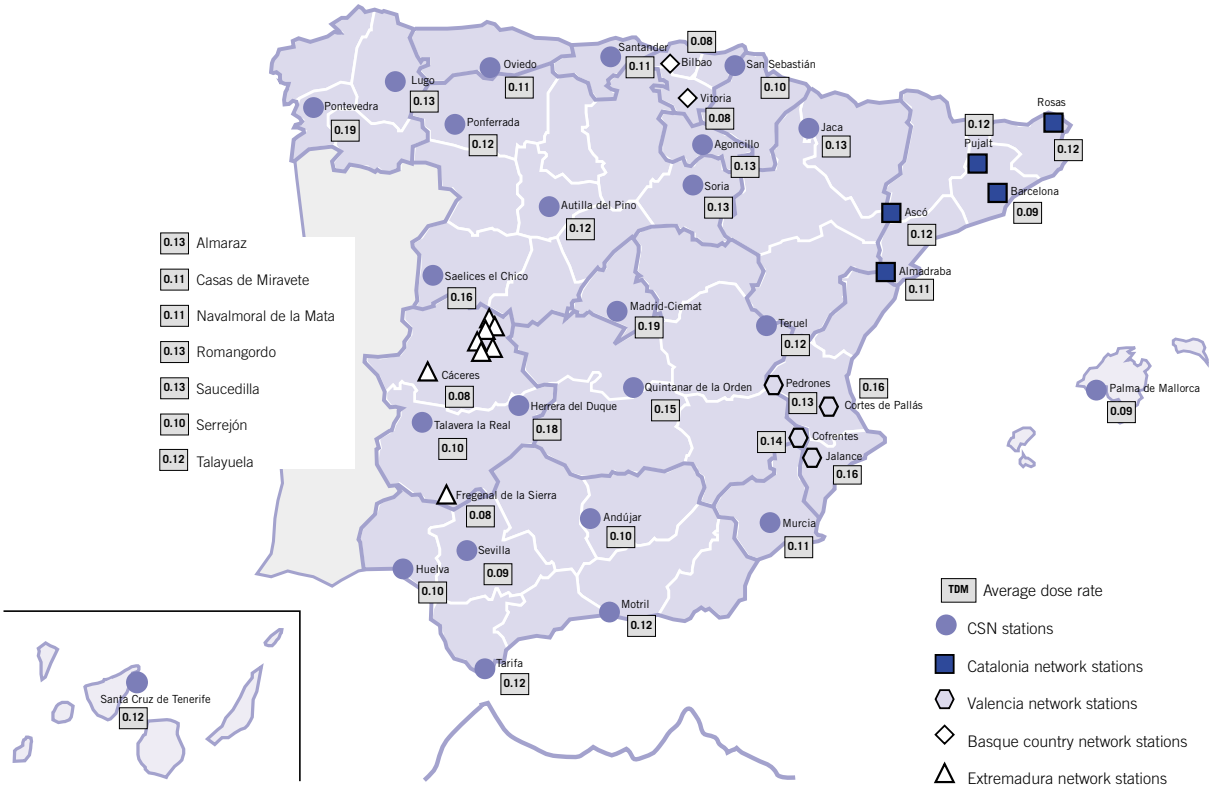
The results of the measures performed during 2015 were characteristic of the environmental radiological background and indicate the absence of any radiological risk for the population and the environment.

Sampling Stations Network (SSN)

In this network, samples are taken of the air, soil, drinking water, milk, type of diet, and continental and coastal waters. Consideration is given to the following:

- *Dense networks*, with numerous sampling points to properly monitor the entire territory.

Figure 3.2.2.5. ASN Average gamma dose rate values. 2015 (microSievert/hour)



- *Spaced networks*, with very few sampling points and where highly sensitive measurements are required.

The overall assessment of the results obtained in 2014[1] showed that the values are consistent with the levels of background radiation and generally remain relatively stable over the different periods, showing slight variations between points that is related to radiological characteristics typical of different areas.

[1] This report show the results of the 2014 Environmental Radiological Surveillance Programme (ERSP). This is due to the processing and analysis of samples that do not allow to include the 2015 campaign results in the same year report.

4. Tracking and control of facilities and activities

4.1. Regulations and standards

The exercising of the CSN's regulatory capacities gave rise in 2015 to the approval of Council:

- Instruction IS-36, of January 21st 2015, on criteria for the reporting of events at nuclear power plants (Official State Gazette, of February 17th 2015). This Instruction establishes the requirements for the Spanish nuclear power plants in relation to the emergency operating procedures and severe accident management guides, which are necessary to ensure the safe operation of nuclear power plants without undesirable consequences for security.

- Instruction IS-37, of January 21st 2015, on the analysis of nuclear power plants and design-based accidents (Official State Gazette, of February 26th 2015). This Instruction contributes to the establishment of a proper regulatory framework, while reconciling the practices followed until the present day and supporting the design basis of existing operating nuclear plants.

- Instruction IS-38, of June 10th 2015, on the training of persons involved in the road transportation of radioactive material (Official State Gazette, of July 26th 2015). With this Instruction, the content and records of initial and periodic training of the Spanish companies involved in this type of transportation is specified, in order to improve conditions for nuclear safety and radiation protection.

- Instruction IS-39, of June 10th 2015, concerning the control and monitoring of packaging manufacture for the transport of radioactive material (Official State Gazette, of July 6th 2015).

With regards to Safety Guides, GS 05.14 (rev. 1), 'Bases for the drawing up of information on the operation of radioactive of industrial gammagraphy facilities' was approved by the Plenary on January 8th of 2015.

It has also been adapted to the 2015 edition of ADR, the GS 06.05 (rev.1) 'Help Guide for the application of regulatory requirements on the transport of radioactive material'.

During the year 2015, the provision that affects the CSN regulatory framework has been approved and published:

Royal Decree 1054/2015, of November 20th, approving the State Civil Protection Plan against Radiation Hazards.

Royal Decree 1564/2010, of November 19th, which approved the Basic Directive on Planning Civil Protection against Radiation Hazards, establishing the minimum criteria to be followed for the development, implementation and maintenance of the special plans' effectiveness of civil protection against radiological risk in the territorial areas that require it. The State Civil Protection Plan against Radiation Hazards is derived from the Basic Directive and establishes the organisation and operating procedures.

Royal Decree 1086/2015, of December 4th, is an amendment of the Royal Decree 1308/2011, of September 26th, on physical protection of nuclear facilities and materials, and radioactive sources.

This amendment responds to the need to update the Royal Decree 1308/2011 to the legislation passed after its coming into force, with respect to matters of cybersecurity, critical infrastructure and transparency. Also, it reflects the experience gained in processing the document entitled 'Physical

Protection Plan of nuclear facilities', and the need to coordinate the approval of the Specific Protection Plan provided for in Royal Decree 704/2011, of May 20th, through which the regulation to protect critical infrastructure was approved.

During 2015 we also worked in the transposition of the following Euratom Directives:

- Council Directive 2014/87/Euratom, of July 8th 2014, an amendment of the Council Directive 2009/71/Euratom establishing a Community framework for nuclear safety of nuclear installations.

- Council Directive 2013/59/Euratom of the Council, of December 5th 2013, laying down basic safety standards for protection against the dangers arising from exposure to ionising radiation and repealing Council Directives 89/618, 90/641, 96/29, 97/43 and 2003/122 Euratom.

4.2. Operating nuclear power plants

4.2.1. General and licensing issues

During 2015, the Plenary of the Council issued 53 resolutions for authorisations, most regarding requests to review the official nuclear power plant operation documents, and 18 favorable reports related to Complementary Technical Instructions and deadlines to implement the requirements contained therein.

As a result of the modification of the Regulation on Nuclear and Radioactive Installations (RINR) related to the Royal Decree on Physical Protection 1308/2011's entry to force, the CSN proposed Minetur to modify the authorisation of nuclear power plants' physical protection to indicate that said authorisations are granted on the basis of the Physical Protection Plan (PPF). It also proposed the inclusion of the PPF's review procedure, which currently appears in the operating permits.

During 2015, the CSN started working to establish implementation guidelines for the third cycle of periodic reviews (RPS) of nuclear power plants, which will begin in 2017 with the Almaraz and Vandellós II the first nuclear plants to be reviewed.

On May 27th 2014, the licensee of the Garoña nuclear power plant requested the renewal of the operating license.

In the CSN's Plenary Meeting of July 30th 2014, it was agreed to issue the Complementary Technical Instruction Reference CSN / ITC / SG / SMG / 14/01 on documentation and additional requirements regarding the application for renewal of the operating license to the licensee.

The evaluation process of the application has continued, although some assessments have been slightly delayed due to lack of necessary information, pending delivery by the licensee, and the delay of the licensee in the implementation of the required modifications.

The overall assessment of the operation of nuclear power plants is carried out with the main considerations of: the results of the Integrated Plan Supervision System (SISC); the incidents reported, especially those classified in the International Nuclear Event Scale and Radiological IAEA Scale (INES) with a level greater than zero; the radiological impact; the dosimetry of workers; and other relevant aspects such as raised modifications, warnings and sanctions, and incidences of operation.

Table 4.2.1.2 contains specific data on the design characteristics of nuclear power plants, dates of authorisations for siting, building, commissioning, and the year expected for the saturation of spent fuel pools.

Table 4.2.1.1. Basic characteristics of the nuclear power plants

	Almaraz	Ascó	Vandellós II	Trillo	Garoña	Cofrentes
Type	PWR	PWR	PWR	PWR	BWR	BWR
Thermal power (MW)	U-I: 2,947 U-II: 2,947	U-I: 2,940.6 U-II: 2,940.6	2,940.6	3,010	1,381	3,237
Electrical output (MW)	U-I: 1,049.43 U-II: 1,044.45	U-I: 1,032.5 U-II: 1,027.2	1,087.1	1,066	465.6	1,092.02
Cooling	Open Arrocampo Reservoir	Mixed, Ebro River Towers	Open Mediterranean	Closed Towers, make-up from Tajo River	Open Ebro River	Closed Towers make-up Júcar River
Number of units	2	2	1	1	1	1
Preliminary authorisation units I/II	29-10-71 23-05-72	21-04-72 21-04-72	27-02-76	04-09-75	08-08-63	13-11-72
Construction license units I/II	02-07-73 02-07-73	16-05-74 07-03-75	29-12-80	17-08-79	02-05-66	09-09-75
Start-up authorisation units I/II	13-10-80 15-06-83	22-07-82 22-04-85	17-08-87	04-12-87	30-10-70	23-07-84
Year of fuel pool saturation units I/II	2020 2022	N/A(*) N/A(*)	2021	N/A(*)	N/A(*)	2021

(*) Equipped with a store for the dry storage of irradiated fuel.

Table 4.2.1.2. Summary of nuclear power plant data for 2015

	Almaraz I/II	Ascó I/II	Vandellós II	Trillo	Garoña	Cofrentes
Permit in force	07-06-10 07-06-10	02-10-11 02-10-11	21-07-10	16-11-04	Until 06-07-13 operating permit From 06-07-13 definitive shutdown	20-03-11
Period of validity (years)	10/10	10/10	10	10	N/A	10
Number of inspections in 2015	32	33	27	23	26	28
Production (GWh) I/II	8,777.462 7,927.667	7,393.995 8,442.114	7,787.836	792.000	–	7,429.869
Load factor (%) I/II	95.48 86.65	85.34 97.58	81.78	99.86	–	80.84
Operating factor (%) I/II	98.32 88.00	88.19 98.82	83.95	100	–	83.63
Hours coupled to the grid I/II	8,612.50 7,708.00	7,725.33 8,565.31	7,354.14	8,018	–	7,325.55
Refuelling outages I/II	NO (U-I) 31-05-15 11-07-15 (U-II)	31-10-15 13-12-15 (U-I) – – NO (U-II)	25-09-15 29-06-15	29-04-15 28-05-15	N/A	27-09-15 14-11-15

4.2.2. Nuclear power plants inspection, supervision and control: SISC

The CSN's Integrated Nuclear Power Plant Supervision System (SISC) is a fundamental tool for monitoring the operation of the Spanish nuclear power plants and establishing the necessary corrective actions based on the results. As part of the on-going review and improvement of the SISC, the system has been provided with new elements contributing to more detailed monitoring of the plants' operation, especially regarding transversal issues.

On July 1st 2014, the pilot phase of the transverse components within the SISC monitoring process began. The objective of this new approach would be to make some type of indicator or alert available, which would allow the CSN to identify possible degradations affecting organisational and cultural aspects or impacting on nuclear safety, thereby making it possible to take appropriate actions. Although the planned duration was one year, ending June 30th 2015, after analysing the results of the pilot phase, the Council extended the pilot phase until March 31st 2016, in order to introduce amendments and adjustments needed in the monitoring programme.

These indicators or warnings will be obtained through the findings of all inspections carried out by the CSN, which involves all inspection activities of the CSN. By December 2015, all performance indicators and inspection findings affecting the action matrix were green, with the exception of a white flag on the pillar of Almaraz (unit II)'s mitigation systems, based on the reliability of the emergency diesel generators.

On 2015, the plants have been in the situation of normality, with the application of standard inspection programs and correcting deficiencies, a situation called 'licensee response' in the action matrix of SISC. The only exception has been Almaraz, which remained in the column called the 'regulatory response' by the target mentioned indicator, in the third and fourth quarters of 2015.

The total number of inspections at operating power plants during 2015, including Santa María de Garoña, was 168. There have been 61 inspections in addition to those referred to in the Basic Inspection Programme (PBI) considered standard; a total of 107 inspections, including 24 quarterly inspections by resident inspectors of the power plants.

These 107 inspections do not include: inspections in reaction with operating incidents; special inspections of generic issues due to new regulations and domestic, in-house, and industry operating experience; inspections related to the issuance of various license issues; and other inspections planned as generic or previously planned due to the action plans of the power plants. This year there have been 28 unplanned inspections.

Sanction proceedings and warnings

In 2015, the CSN proposed that the Ministry of Industry, Energy and Tourism initiate sanctions to the following:

Almaraz nuclear power plant, for non-compliance with the Operation Technical Specifications (ETF) and the Council's Instruction IS-10, due to the neglect of fire prevention surveillance rounds and records falsification.

In the year 2015, the CSN issued the following warnings to the following nuclear power plants:

Almaraz I and II NPP, as a result of the noncompliance with the radiation Protection manual, in relation to the in-house staff being contaminated at the facilities.

Vandellós II NPP, due to the neglect of the technical specification 3/4.3.2 'Instrumentation of the technological safeguards performance system'.

4.2.3. Monitoring of actions deriving from the Fukushima nuclear power plant accident

The CSN post-Fukushima requirements applied to the Spanish nuclear power plants were incorporated in four Complementary Technical Instructions (known as CTI-1/2/3/4), issued by the CSN during 2011 and 2012. In April 2014, the CSN issued a new CTI for adaptation of the post-Fukushima CTIs, in order to consistently reflect the requirements of the previous instructions with completion dates after January 1st 2014.

In February 2013, the CSN required the licensees of the plants to provide a six-monthly tracking report on activities relating to these post-Fukushima CTIs, to be submitted within the month following the end of each six-month calendar period, with previously established contents identifying of the progress made at each plant and explaining possible problems encountered in complying with the terms set out for the completion of these activities.

In the specific case of the Sta. María de Garoña NPP, the post-Fukushima requirements of CTIs 1/2/3/4 were adopted to cease exploration activities on July 2013 by the CTI-5, being still inactive. All requirements of this CTI-5 adapted to the cease of activities have been implanted.

In 2015, the licensees of power plants submitted two reports on the status of the requirements derived from the post-Fukushima CTI: a report in January for the second half of 2014, and another report in July for the first half of 2015. In January 2016, the report on the activities carried out in the second half of 2015 shall be submitted. Based on the compliance reports from 2015, the CSN has written evaluation reports on the degree of advancement of the actions required, monitoring actions of the activities carried out by the CSN itself.

During the year 2015 the CSN has made 18 nuclear power plant inspections to check the compliance with the post-Fukushima CTIs. In these inspections, resistance tests carried out simulating the loss of large areas and scenarios of extensive damage have been checked. The following aspects specifically monitored in these inspections are:

- Electrical and instrumentation systems.
- Major fires protection.
- Responsiveness to internal floods, in case of earthquake.
- Responsiveness to external flooding and other extreme natural events.
- Human resources and additional radiation protection equipment for those already existing to deal with severe accidents (means for estimating radioactive emission scenarios analysed in the resistance tests).
- Monitoring of actions post-Fukushima in relation to radioactive effluents.
- Emergency management.
- Seismic margins.

The results of the aforementioned inspections are subject to the same treatment as the rest of the CSN inspections, and are associated with the corresponding action in the programme for identifying and resolving the of problems of each plant (PAC).

Among the activities carried out in 2015, those that stand out are advances in the design, implementation, and major design modifications to new alternative centres of emergency management, Hydrogen Passive Autocatalytic Recombiners, and the vent filter containment systems.

On February 24th 2015, the licensee of the Ascó II nuclear power plant requested an extension of the term of compliance with the requirement 2.2. b2 of the CTI post-Fukushima, concerning protection against circumferential pipeline breaks not seismic category I, since the changes derived from analyses on protection against spray water had not been included in the design modifications. These were planned to be implemented within the time limits in this requirement, since they were not within the framework required by the CTI post-Fukushima. The deadline extension was requested to March 16th 2015 until the No.23 fuel reload for April-June 2016, a request that was highly appreciated by the Plenary of the Council.

In 2015, the licensee of the Ascó NPP presented the following requests:

- An application for authorisation to commission the insulation of retaining part of Ascó I NPP's containment filter venting system (SVCF), to be implemented in the fuel reload of October 24th 2015. In the CSN Plenary Meeting of November 11th 2015, the request was reported favorably and the Minetur authorised it in the resolution of November 11th 2015.

- A request for favorable assessment of the Hydrogen Passive Autocatalytic Recombiners (PAR) in the containment, received on April 27th 2015 for Ascó I NP and on October 7th 2015 for Ascó II NPP. The Plenary of the Council appreciated both applications favorably at its meeting on February 12th, 2015.

The licensee of the Ascó and Vandellós II nuclear power plants requested on October 8th, 2015, an extension of the deadline for the commissioning of the Alternative Emergency Control Centre (CAGE) in both plants, required according to the CTI post-Fukushima. The extension of the deadline was from December 31st 2015 to November 31st 2016. In the Plenary Meeting on December 9th, 2015, the request was judged favorably by the CSN.

On October 23th 2015, the licensee of the Cofrentes nuclear power plant requested an extension of the period of compliance with the requirement 2.4.a of the CTI post-Fukushima of Cofrentes NPP, relating to the commissioning of the CAGE. In particular, the extension of the deadline was from December 31st 2015 to June 30th 2016. In the Plenary Meeting on December 15th 2009, the application was judged favourably by the CSN.

In 2015, the licensee of the Cofrentes NPP submitted the favourable assessment of the Hydrogen Passive Autocatalytic Recombiners (PAR) Cofrentes NPP Hydrogen Passive Autocatalytic Recombiners (PAR) in the containment received on April 21st 2015. In the Plenary Meeting on October 28th 2015, the request was judged favorably by the CSN.

In 2015, the licensee of Trillo NPP submitted a request for approval of the commissioning of the CAGE. In the Plenary Meeting on October 9th 2015, the request was judged favorably by the CSN.

In relation to the implementation of required improvements in the CTI post-Fukushima, through letters of the technical Directorate for Nuclear Safety (DSN), the need to submit three amendments was communicated to the licensees of power plants, in order to design following a specific process of authorisation before its

commissioning: the construction and commissioning of the CAGE, the installation and commissioning of a containment filter venting system (SVCF), and the installation and commissioning of Hydrogen Passive Autocatalytic Recombiners (PAR) in the containment building.

4.2.4. Safety improvement programmes

4.2.4.1. Periodic security review programmes

During 2015, the CSN has advanced in the evaluation of the periodic safety review of the Santa María de Garoña NPP as discussed in the 2014 Annual Report. The result of this assessment will be incorporated into the mandatory report of the CSN to Minetur concerning the renewal of the authorisation of exploitation.

A second cycle of ten-year periodic security reviews (RPS) of all operating Spanish nuclear plants was completed with the renewal of the authorisation of exploitation of the Trillo NPP in November 2014. During 2015, the CSN initiated work to establish guidelines for the implementation of the third cycle of RPS of the Spanish plants, which will start in 2017 with Almaraz and Vandellós II as the first power plants to carry it out.

4.2.4.2. Human and organisational factors

Since 1999, all the Spanish nuclear power plants have had safety assessment and improvement programmes relating to organisational and human factors. The fuel assembly manufacturing facility of Juzbado also joined this initiative a few years later. Now these programmes have been proven to be sufficiently mature, however continue to show potential for improvement, higher or lower depending on each specific installation.

In the year 2015, such programmes were inspected in the Cofrentes nuclear power plant and the Juzbado manufacturing facility.

4.2.4.3. Cofrentes Nuclear Power Plant Dose Reduction Master Plan (DRMP)

An assessment of the overall evolution of operational doses during the period 1999-2009

was performed within the scope of the Cofrentes nuclear power plant Periodic Safety review. As a result of the different analyses and checks, and of the evaluation process performed by the CSN in the context of the plant's operating license renewal, it was concluded that there was a need for the Safety Improvement Programme to be strengthened in relation to radiological impact, in terms of the occupational doses associated with the long-term operation of the facility. Thus, among the limits and conditions associated with the operating license, the requirement for the revision of the Dose Reduction Master Plan (DRMP) was introduced.

The main objective of this plan is to describe the most important courses of action and the action plan developed as part of the plant's ALARA policy, with a view to reducing the individual and collective doses of the workers during both normal operation and outages.

During 2015, the CSN continued the process of tracking and control of this Improvement Programme.

4.2.5. Generic issues

A generic issue is understood as being any safety-related problem identified at any national or overseas nuclear power plant that might affect other plants. The CSN monitors these issues and promotes the analysis of their applicability to the Spanish nuclear power plants and the adoption of corrective actions identified as a result of such analysis.

Throughout 2015, the most relevant generic issues have been as follows:

Noncompliance within surveillance rounds related to fire protection

This topic started after the Reportable Events Reports (ISN) issued by Almaraz NPP for breach of the technical specification of the Operation Technical Specification (ETF) 3.7.12, when the CSN Resident Inspection detected anomalies in time monitoring record sheets, which must be established, according to the ETF, when there are barriers against out-of-control fires. In particular, the Resident Inspection found several sheets of fire barrier monitoring records in variance with those already completed the last time around.

The CSN sent a Technical Instruction to the rest of Spanish nuclear power plants and to the Juzbado fuel assembly manufacturing facility requesting that, within the period of six months, they should perform an extension analysis of the status in order to verify their situation in relation to the periodic activities related to compliance with the ETF or the Operation Requirements Manual (MRO), whose only required verification is through documents, they shall propose necessary corrective measures so that a similar breach could not pass unnoticed to the organisation and provide the results of this analysis to the CSN. The specialised area of the CSN is evaluating the responses of licensees through their inspection of the Base Inspection Plan (PBI).

Laboratory testing of pressure safety valves callibrated at the end of the cycle (as-found) out of the range of admissible tolerance (+ - 3%)

This generic theme derived from the Reportable Events Reports notified by the Almaraz NPP on relief safety valves, which due to the drift during the operation cycle were outside the acceptance limits established by the ETF 4.0.5 (± 3% nominal value).

Within the activities of power increase in 2009 and 2010 for units I and II respectively, the seal of steam was removed and the safety valves were remachined. Since then, several cases of leaks had occurred by the valve seat. In order to solve this problem, one of the actions considered was to improve calibration of set points in an external laboratory (in external laboratories tests are conducted with a bank of pressure, so the accuracy of the calibration point setting is much greater than the setting in situ). After the first results of the external laboratory, three of the units I and II pressuriser safety valves were outside the range of allowable values for the as-found calibration, therefore concluding that the procedure of calibration on-site of the pressuriser safety valves was vague and could not ensure the operability of the same over the cycle.

Subsequently the same problem has arisen in other Spanish nuclear power plants.

The CSN is carrying out a follow-up through inspections.

4.3. Nuclear fuel cycle and radioactive waste eisposal, and storage facilities and research centres

This heading includes the Juzbado fuel assembly manufacturing facility, the El Cabril radioactive waste disposal centre and the Centre for Energy-Related, Environmental and Technological Research (Ciemat).

All of these installations operated within the established safety margins throughout 2015, without any situations of undue risk.

Also included are requests relating to the Centralised Temporary Storage (CTS) facility.

4.3.1. General and licensing issues

Throughout 2015, the CSN passed judgment on 18 applications for authorisation and stated

favourable remarks on five requests. Said dossiers referred to the following installations:

- Juzbado fuel assembly manufacturing facility: seven favorable reports were issued in relation to design modifications or changes to official operation documents and three favorable remarks.

- El Cabril disposal centre: three favorable reports were issued in relation to design modifications or changes in the official operation documents.

- Ciemat: two authorisations for modifications, one favorable report.

- Centralised Temporary Storage (CTS) facility: the CSN has issued the mandatory report in relation to the application for prior authorisation or location.

Reported events

In the fuel assembly manufacturing facility in Juzbado, there were four reportable events that did not pose a risk to workers, the public or the environment.

- On January 3rd 2015, the critical alarm system (SAC) was activated, however it was a false alarm. After the alarm, all units of the ventilation and air conditioning system (HVAC) were automatically locked and the special fluids in sintering furnaces automatically switched from hydrogen to nitrogen. Personnel were successfully evacuated.

  At the time of the installation the manufacturing facility was in Operation Mode 2, therefore not having nuclear material movement. The cause was a malfunction of an electronic component of the RAM card from one of the Data Acquisition Module (DAM), which apparently was able to restart.

  The HVAC interlock and the switching of gases in the furnaces are specified in the Operating Technical Specifications (EF) as a reportable event in 24h.

- On January 14th 2015, the critical alarm system (SAC) was activated, however it was a false alarm. The cause was a human error made during the maintenance operations and checks being made on one of the DAMs, which presented anomalies following the actions taken as a result of previous reportable event. The same interlocking happened as in the previous case and therefore the event was considered reportable within 24 hours.

- On August 4th 2015, there was a false alarm (SAC) as a result of power failure in one of the DAMs. The manufacturing facility was in Operation Mode 4, not having nuclear material movement at the facility. The automatic interlocking of the SCVA units occurred as anticipated. The cause of the event was a failure in the capacitor which was located in the input power supply short, causing a shortcut, as a result of ageing.

  In addition to the repair actions, the licensee has decided to replace all the capacitors of the power supplies of the SAC's DAMs with new ones and set August 31st 2016 as the deadline to complete the replacement.

- On October 19, 2015, there was a reportable event in 24h due to not carrying out the surveillance requirement of the P-RV-11.3.4.2. 'Quarterly checking of the electric batteries' applied to the CSLA-1, 2 and 3 switchboards' batteries.

  The analysis of this event determined that the causes were fundamentally inadequate management of the implementation of the Surveillance Requirement (RV). The up-to-30

days Report details the corrective actions: studying the definition of the execution period computer alerts of the Surveillance Requirements (RV), implementing a programme to digitalise the reports of the RV, conducting a training session on roles and responsibilities according to the official documents, on the objective and importance of the successful completion of the Surveillance Requirements (RV), etc., and including in the procedures of the Control Room (SC) instructions for issuing various warnings when implementing the Surveillance Requirements (RV).

4.3.2. Monitoring and control of the Juzbado fuel assembly manufacturing facility

Within the framework of its control programmes, the CSN performed a total of 12 inspections at the Juzbado fuel assembly manufacturing facility.

The Juzbado manufacturing facility Supervision and Monitoring system (SSJ) undertakes evaluation of the operation of the installation. The supervision system is two-yearly, the same as the extension of the facility's Basic Inspection Plan. It begins with an analysis of the deviations or findings documented during the review period.

According to the assessment of the Juzbado manufacturing facility Supervision and Monitoring system (SSJ), for the period 2013-2014, the Juzbado manufacturing facility has overall worked adequately from the point of view of safety.

From the point of view of safety, the operation of the facility during 2015 has been acceptable, and has not involved any risk for the workers, the public, the environment, or given rise to situations that would have required activation of the Emergency Plan.

Sanctions and warnings

The CSN has not had to propose any sanction proceedings or to issue any warnings to this facility.

4.3.3. Temporary storage facility

- Enresa introduced requests for prior authorisation, for site, or construction permits, for the nuclear installation of centralised spent nuclear fuel and high-level waste temporary storage facility (ATC) to the Ministry of Industry, Energy and Tourism in January 2014.

- In 2015, the evaluation process associated with the issuance of the mandatory report in accordance with the provisions of article 2.b) of Law 15/1980 has continued in the CSN, in relation to applications submitted. Progress has been made in the two applications.

- According to a new model of project management, since April 2014 it was established that a Document Management Support (DAG) would be systematically developed. This document includes a calendar of the CSN's activities; the technical evaluation guidelines; the memos of all meetings with the Ministry of Industry, Energy and Tourism (Minetur); the memos of meetings with Enresa (high-level meetings and technical meetings); the memos of meetings with the Ministry of Agriculture, Food and Environment; the requests for additional information; the CSN inspection reports; the employment positions for the CSN technical support team; and the model for the institutional presentation of the project.

a) Evaluation activities associated with authorisations:

a.1) Request for prior or site authorisation

The Plenary meeting of the Council on July 27th 2015, considered thoroughly the request for prior or site authorisation, and the proposal of technical advice, agreeing to report favorably with the same limits and conditions. The favorable assessment is based on the set of terrain features and the design of engineered barriers implemented to guarantee safety. The technical evaluation finds that the proposed site has no selective phenomena. The major aspects of these limits and conditions include the proposal to issue three complementary technical instructions in order to request the details of the process of implementing infrastructure projects, the monitoring of conditions and phenomena on site through a set of activities, plans and studies, and the updating of the site design basis.

a.2) Application for construction permit

In January 2015, the CSN issued a request for additional information associated with the documentation supporting the application for authorisation of construction, in addition to the three requests submitted in 2014.

In response to all requests for additional information, in August 2015 Enresa introduced Revision 1 of the Preliminary Safety Analysis Report (EPS), which was supplemented with the presentation of the set of technical support documents in October.

Currently the new documentation provided is under evaluation by the technical areas.

Throughout 2015, an IT has been developed on the centralised temporary storage of the Directive 2014/87/Euratom of the Council, on July 8th 2014, amending the Directive 2009/71/Euratom. This directive provides, inter alia, safety objectives that are applicable to the design, siting, construction, operation and decommissioning of nuclear facilities that obtain construction authorisation subsequent to August 14th 2014. This IT was issued in the Plenary Meeting in the beginning of 2016.

a.3) Environmental impact study

On September 26th 2014, the Ministry of Industry, Energy and Tourism requested the CSN to anticipate the radiological impact assessment of the Centralised Temporary Storage (ATC) project. The Plenary Meeting of the Council on July 15th 2015 provided a report in the framework of its powers, in the sense that the radiation impact due to the normal operation of the installation of ATC on the population and the environment it is not significant.

b) Inspections

Two inspections were carried out. One on the site recognition of ATC and checks on the site characterisation-related work and available results, and the other one on the design process control and application of the quality guarantee proceeding.

4.3.4. Monitoring and Control Centre Storage of Radioactive Waste at El Cabril

In the development of their respective control programs, the CSN carried out a total of 12 inspections in the storage centre El Cabril.

Solid radioactive waste of low and medium activity generated in nuclear and radioactive facilities are managed in the El Cabril storage centre, which features storage cells for this purpose (north and south platforms). It also has very low activity waste storage cells (east platform).

In 2015, there was a total of 187 expeditions at the facility. 164 were related to low and medium activity waste (148 of nuclear facilities, and 16 of radioactive ones), 17 were related to very low level waste (14 nuclear facilities and 3 of radioactive ones), and six were of low and medium and very low waste (two out of four nuclear facilities and four radioactive ones) with:

- 3,212 packages, containing 346 units, 31 storage units (CE-2b) and 28 samples from nuclear facilities.
- 647 packages or radioactive facilities containment units.

This year, in the facilities residue quality check laboratory, characterisation studies of actual waste packages from nuclear power plants and waste samples from radioactive installations were carried out. Tests to determine the quality of the final product depending on the type of cement, dosage, presence of compounds, etc., were also carried out on samples of simulated waste and there were also studies of historical packages located in the storage modules of installation.

In 2015, cell 19 had remained operational and was completed, and cell 24 was no longer operational. The very low level waste was stored on line 2 of section I of cell 29.

In 2013, a pilot programme of the monitoring and specific control system for the installation was conducted and it began to be applied definitely throughout 2014. According to the PG.IV.15 'El Cabril Centre Storage Monitoring and Tracking System (SSSC) procedure, the frequency of supervision and monitoring process is biennial.

The indicators of operation of the installation are part of the areas designated for emergencies, for operational radiation protection and radiation protection for the public. From the calculation of performance indicators during 2015, it follows that all are located in the category of Normal Operation, except for the one corresponding to the response when faced with drills and emergency situations that require intensified surveillance in the area.

The monitoring process is based on the information collected from the following sources: performance indicators, which are connected by the installation of the CSN, and inspections and evaluations conducted by the CSN. The system is based on the verification of the operation of the facility in accordance with the regulations, authorisations and other applicable requirements.

Warnings

The CSN has not had to propose any sanction proceedings or to issue any warnings to this facility.

4.3.5. Monitoring and control of the centre for energy-related, environmental and technological research (Ciemat)

In the performance of their respective control programmes, the CSN performed a total of eight inspections at Ciemat.

The decommissioning project (PIMIC-Decommissioning) affects the area that housed the most representative nuclear facilities in the former Nuclear Energy Board (JEN) ??and is being carried out by Enresa.

The rest of the site is covered by the so-called PIMIC-Rehabilitation project, which includes some of the installations whose dismantling was initiated previously and the restoration activities of radiologically affected areas of the centre.

In 2015, almost all of the decommissioning phases were completed and the disposal of solid radioactive waste to the temporary storage of El Cabril continued. Nevertheless, there are some activities to conclude such as:

- The transfer of waste collected in storage facilities to El Cabril.
- Decontamination of a part of the area known as la Covacha.
- Decision on the performance of part of building 18's foundations.
- Final characterisation of the buildings containing house radioactive waste, once these have been transferred.

Warnings

The CSN has not had to propose any sanction proceedings or to issue any warnings to this facility.

4.3.6. Monitoring and control of the Quercus uranium concentrates plant

The CSN performed two inspections in undertaking the programme for the supervision and control of the Quercus plant.

This facility has been in a definitive shutdown condition since 2003. After several delays caused by Enusa, the licensee submitted a new request for the dismantling of the facility on November 5th 2013.

On September 14th 2015, after a change of strategy and regulation, Enusa, the licensee of the facility, made a request for phase I decommissioning authorisation from the Ministry of Industry, Energy and Tourism.

The activities performed during 2015 focused on treatment of the liquid effluents collected from the different drains of the mining site existing in the area (cutting waters) and from the liquids washing over the tailings dyke for conditioning and release. No transports of radioactive material were performed due to the absence of uranium concentrate stocks.

Warnings

The CSN has not had to propose any sanction proceedings or to issue any warnings to this facility.

4.3.7. Retortillo plant

The Ministry of Industry, Energy and Tourism granted prior authorisation to Berkeley Minera España SL as a first category radioactive installation of the nuclear fuel cycle at the Retortillo plant, to manufacture concentrates of uranium through the Order EIT/1944/2015 on September 17th, as published in the Official State Gazette No. 230 of September 25th, which had been informed favourably by the CSN on July 8th 2015 with limits and conditions.

4.3.8. Uranium mining

This heading includes activities relating to the arrangements for authorisations of exploitation of uranium resources, and to the research permits of such resources currently undertaken by the company Berkeley Minera España, SA (BME).

On April 8th 2014, the Directorate General for Energy and Mines of the Regional Government of

Castille and Leon awarded a license to Berkeley Minera España SL for the exploitation of 'Retortillo-Santidad'. Prior to the start of the exploitation, BME must comply with a series of requirements and considerations of radiological protection established by the CSN. During 2015, BME has submitted technical documentation for that matter.

Throughout the year, the activities linked to the permits granted previously to research mineral resources continued. The Regional Government of Castille and Leon requested the CSN assessment report on a new request for the research permit.

On February 23rd 2015, the CSN issued the mandatory report to grant permission for the Regional Government of Castille and Leon to research 'The Vaqueril'.

In 2015, the CSN received a total of nine reports on the compliance of radiation requirements, based on the work carried out in the previous year, imposed during the mining research work carried out in the Autonomous Community of Castille and Leon.

4.4. Facilities in the definitive shutdown, dismantling or decommissioning phase

The following nuclear or radioactive fuel cycle facilities have ceased to operate or are in the dismantling and decommissioning phase:

The Vandellós I NPP (in the latency phase following completion of the first phase of dismantling), the José Cabrera NPP (in the dismantling phase), the Elefante uranium concentrates plant (dismantled and in the period of compliance), and the Andújar uranium mill (FUA) (dismantled and in the period of compliance).

The environmental radiological surveillance, workers' radiological protection, security and, where applicable, effluent release control and waste management programmes remain in operation at all these facilities. There were no deviations in the performance of any of these programmes.

In 2015, the activities carried out at each of these facilities, in-keeping with their respective status, were performed within the safety limits established and without any undue impact on persons or the environment.

4.4.1. Licensing, inspection and control

The CSN issued five favorable reports and five favorable approvals:

Vandellós I NPP:

- Favorable report of the CSN (July 29th 2015) on revision 4 of the Operating Regulations and revision 2 of the Site Emergency Plan.

José Cabrera NPP:

- Favorable approval from the CSN (July 29th 2015) on revision 3 of the fire protection programme applicable to the dismantling.

- Resolution of the DGPEM, of 2nd December, amending the annex to limits and conditions on nuclear safety and radiation protection in the order ITC/204/2010, on 1 February, which authorised the transfer of the license of the nuclear José Cabrera from the company Gas Natural SA to the national company for radioactive waste, SA, and was given this final authorisation for the execution of the dismantling of the plant.

- Agreement of the Plenary of the Council, on November 18th, on the amendment of the complementary technical instructions associated with the dismantling authorisation of the José Cabrera NPP that were affected by the modified limits and conditions.

- Resolution of the DGPEM, on December 2nd, which modifies the authorisation of physical protection associated with the authorisation of dismantling.

- Favorable approval of the CSN, on December 2nd, of the proposal of design modification for the installation of a decontamination workshop in the auxiliary building of the dismantling.

- Favorable approval of the CSN, on December 2nd, of the results report of the workshop's operation test in the auxiliary building of the dismantling.

- Favorable report of the Minetur, on December 2nd, on the request of Enresa's approval for the proposal of design modification to the connection of the auxiliary building's decontamination workshop, of the dismantling the system of treatment of liquid waste and the proposed revision 7 of the study of security applicable to the dismantling.

- Favorable report for the Minetur, on December 2nd, on the approval of the proposed revision 3 on the Operating Specifications applicable to the dismantling process requested by Enresa.

- Favorable approvals of the CSN, on December 2nd, of the proposal of revision 5 on the Manual for Off-Site Dose Calculation applicable to the dismantling process.

Within the framework of its control programmes, the CSN performed a total of twelve inspections: four at Vandellós I nuclear power plant and eight at José Cabrera nuclear power plant.

In 2015, there was a reportable event in the José Cabrera nuclear power plant. On February 23rd, it was reported to the Salem of the CSN that at 5:16 PM, the staff present at the facility felt a tremor that was not detected by the seismic instrumentation of the site. Subsequently, the earthquake was confirmed with the National Geographical Institute. There were inspection activities implemented on the structures in the ATI and the rest of the facilities, with no damage detected.

4.5. Radioactive facilities

4.5.1. General aspects

In 2015, the operation of scientific, medical, agricultural, commercial and industrial radioactive facilities took place within the established safety standards and the measures required for the radiological protection of persons and the environment were fulfilled.

Table 4.5.1.1 shows the evolution of the number of radioactive facilities.

Radiation Facilities with Viability Problems

At the end of 2013, the CSN sent a Technical Instruction to all radioactive installations on the 'Problems of viability of the Radioactive Installations', in order to ask facilities whose viability problems may affect radiation safety for actions. In the year 2014, the CSN developed an internal protocol to inventory and increase the control of the facilities which may incur in that situation.

As a result of the implementation of this Protocol, by 2015 the safety of 16 facilities had been totally guaranteed by removing radioactive sources and placing them in a licensed and solvent facility, in the supplier or in Enresa. By the end of the year, 26 facilities in the inventory remained actively monitored by the CSN, according to the degree of risk.

More Control of High-Activity Sealed Sources

The Royal Decree 229/2006, of February 24th, on the control of high-activity sealed radioactive sources and orphan sources, defines this type of source. As the sources that pose the greatest radiological risk, they are subject to regulation and tighter control.

Table 4.5.1.1. Evolution of the number of radioactive facilities

Category	Field of application	2011	2012	2013	2014	2015
1st	Irradiation	1	1	1	1	1
	Research		1	1	1	1
	Subtotal	**1**	**2**	**2**	**2**	**2**
2nd	Commercialisation	57	58	67	68	67
	Research and teaching	102	97	98	101	94
	Industry	563	558	538	517	493
	Medicine	326	322	323	329	322
	Subtotal	**1,048**	**1,035**	**1,026**	**1,015**	**976**
3rd	Commercialisation	14	14	17	17	18
	Research and teaching	90	89	89	83	78
	Industry	195	207	217	220	226
	Medicine	42	38	37	35	29
	Subtotal	**341**	**348**	**360**	**355**	**351**
	Medical X-rays	32,595	33,625	34,592	35,302	36,293
	Total	**33,985**	**35,010**	**35,980**	**36,674**	**37,622**

For this reason, during 2015 the CSN improved the computer application in which the users of these sources load the inventory of each source required by the aforementioned Royal Decree, to make it more user-friendly.

In October, the CSN issued a circular to all holders of high-activity sealed sources (FEAA), as a user manual for the application. As a result, the application grew from 109 users earlier this year to 139 on December 31st 2015, over 80% of the holders of FEAA. The goal is to get 100% of users on the application in 2016.

4.5.2. Licensing

On December 31st 2015, the following communities had already transferred the executive powers over radioactive facilities of the second and third category: Aragon, Asturias, Baleares, Canarias, Cantabria, Cataluña, Castille and Leon, Ceuta, Extremadura, Galicia, La Rioja, Madrid, Melilla, Murcia, Navarra, Basque country and Valencia.

The CSN performed the licensing of facilities in collaboration with the autonomous communities (Catalonia, Balearic Islands and Basque country) that have signed delegation agreements including the evaluation of authorisation requests.

The diagnostic X-ray installations are governed by a specific regulation that establishes a declaration and registration system, in charge of the autonomous communities.

During 2015, 412 reports related to radioactive facilities were issued. The Nuclear Safety Council's personnel assessed 297 of said requests:

- 25 for operating authorisations.
- 47 for decommissioning statements.
- 225 for approvals of various modifications.

In the industrial field and in relation to the approval process, most of the requests reported this year have been of modification and

decommissioning, and to a lesser extent, requests of operation.

During 2015, the modification of the radioactive installation of the ALBA synchrotron, introducing a new line of non-ionising radiation infrared light BL01 MIRAS, has been carried out.

The new line of light (MIRAS) is dedicated to experiments using micro infrared spectrometry with synchrotron radiation and it will allow the use of micro analytical spectroscopy, in the midrange and far infrared, in fields such as medicine, food science, chemistry, environmental sciences, geology, physics, forensic science, and archaeology.

A high percentage of operating requests and some of the modification requests this year refer to portable equipment with pistol grip for the analysis of materials. The increase in the use of this type of equipment was already detected in previous years and it has followed in 2015.

Moreover, there has been a high percentage of decommissioning and closure of facilities with radioactive equipment for measuring the density and moisture of soils and industrial scintigraphy, due to the fall of civil works projects.

Within the range of control activities of the radioactive facilities, the optimisation of the dose in the different types of installations has been specially monitored, with a special focus on the sector of the portable scintigraphy, which is the one with the biggest problems in relation to radiation protection. However, as is demonstrated by the recent experience, it has experienced a marked improvement in recent years.

In 2015, the control has been focused on radioactive facilities in crisis or in bankruptcy, in order to ensure conditions of safety and the proper management of radiation protection in the equipment with radioactive sources. In order to structure the performance of the Nuclear Safety Council in situations of companies in crisis and how they cooperate with the other relevant organisations, more efforts have been made to create a protocol.

In the medical field, as already indicated in the previous report, the dismantling of three of 19 cyclotrons existing in Spain for the production of fluorine-18 and other short-lived isotopes that emit positrons, used for carrying out Positron Emission Tomography (PET Scans) exploration techniques in Nuclear Medicine facilities, started in 2014. In 2015, the dismantling of the aforementioned has concluded, the radioactive installation containing one of cyclotrons having been closed, while the installation that contains the other two cyclotrons continues the dismantling process for its subsequent closure.

By the end of 2015 in Spain, there were 97 facilities for PET diagnosis, two of them mobile units. The majority of the PET facilities have mixed cameras with computed tomography (CT) built-in. The PET cameras have been replaced by PET/CT for years.

In terms of external beam radiotherapy, a number of linear accelerators have continued to be replaced during 2015 due to the renewal of old accelerators, with no significant changes to the total number of 265 existing units, which still operate correctly in regards to safety and radiation protection.

4.5.3. Inspection, monitoring and vontrol of facilities

The CSN performs the inspection of these facilities in collaboration with the autonomous communities which it has function assignment agreements.

After several decades of experience and after analysing the international standards and practices, the Technical Directorate for Radiation

Protection decided to modify its inspection programme of radioactive facilities to become more suited to the risk of the facility or activity, hence their frequency and the introduction of unannounced inspections.

During 2015, the CSN implemented a new programme which has proven to fit its purpose. Consequently, in October an information sheet was sent to all radioactive facilities in which they were informed of the programme changes:

- Frequency of the inspection: the new programme will have annual, biennial or triennial control inspections. It may vary depending on the category of radioactive sources and generators.

- Regardless of the frequency of inspection, the CSN will continue to assess each year with the Annual Report issued to each installation.

- Unannounced inspections: under the provisions of Article 43.1 of Royal Decree 1836/1999, of December 3rd, which approves the Regulation on nuclear and radioactive facilities, in the new programme at least 15% of the control inspections will be not be announced.

Throughout 2015, 1,660 inspections were carried out in radioactive facilities. Of all inspections carried out, 20 were made as a result of incidents or complaints received by the CSN. In addition, 67 inspections in 2015 were unannounced, meaning that the licensee received them without notice.

Moreover, there were 38 complaints, concerning radioactive and radio-diagnosis facilities. Whenever it was convenient, an inspection was carried out, after which the complainants were informed about the status of the installation and, when appropriate, a control letter was issued to the licensee.

The analysis of the minutes for the inspections, memorandums of the facilities, information on radioactive materials and equipment supplied by the commercialisation facilities and the waste management data provided by Enresa, led to the direct issuing of 295 control letters by the CSN, 42 by the service responsible for the functions assignment in Catalonia, and 12 by the assignment body in the Basque Country, relating to different technical aspects of the licensing and control of the facilities.

Reported Events

There were seven events reported in radioactive facilities, five in industrial facilities and the remaining two in medical facilities.

Disciplinary Proceedings and Warnings

The CSN proposed the three disciplinary proceedings conducted to the Ministry of Industry, Energy and Tourism. The causes that led to the propositions was the non-compliance with imposed technical requirements.

Due to the actions of evaluation and control inspection at facilities, the CSN gave 17 warnings, the Catalonia Government gave 10, and the Basque Government gave 12, identifying the deviations encountered and demanding licensee correction within two months. In one case a penalty was imposed, since the licensee did not implement the corrective actions required in its warning for a radioactive installation.

4.6. Service entities, personnel licences and other activities

This section encompasses those companies or organisations that are subject to nuclear regulation and provide services to third parties in the field of radiological protection. It includes radiological protection services (RPS), radiological protection technical units (RPTU), companies selling medical X-ray equipment and providing technical assistance in relation to it, personal dosimetry services (PDS), and registered external companies.

Furthermore, the personnel licences currently existing in Spain for all nuclear and radioactive facilities are indicated.

Concerning radiological protection services and units:

In 2015, the CSN authorised a new RPS and the approved authorisations previously granted to five others were modified (four being operational modifications); as a result, at the end of the year the number of authorised RPS amounted to 85.

A total of 22 RPS control inspections were performed: one was carried out by personnel appointed by the CSN and attached to the autonomous community of Asturias, three were carried out by the personnel appointed by the CSN attached to the autonomous community of Catalonia, two carried out by the personnel attached to the autonomous community of Valencia, and two by the personnel attached to the autonomous community of Navarra, the remaining 14 carried out by the CSN itself.

In 2015, the CSN approved a new RPTU and modified authorisation previously granted to two others. It also revoked two RPTUs permits, bringing the total number of authorised RPTUs by the CSN to 40 at the end of the year.

There were 13 RPTUs control inspections, two of them being carried out by the personnel CSN, attached to the autonomous community of Catalonia.

During 2015, the necessary tests that led to awarding a diploma to eight heads of radiation protection services were performed; three applied to Radiation Protection Services and five to the radiation protection techniques units.

Concerning personal dosimetry services:

A new external dosimetry service was authorised in 2015 and there have been modifications to the authorisations that were previously granted to two services, which brings a total of 22 external dosimetry services at the end of the year.

Ten control inspections were performed: seven were for external dosimetry services and three for internal dosimetry services.

Concerning registered external companies:

External companies, or hiring companies, whose workers perform activities in controlled areas are required to register in a specific Nuclear Safety Council register.

Throughout 2015, a total 90 companies entered the Register of External Companies, the vast majority of these carrying out their activities in relation to nuclear power plants.

Concerning companies selling medical radio-diagnostic equipment and providing related technical assistance:

In 2015, the CSN reported on the authorisation of 13 new sales and technical assistance companies and the modification of the authorisation previously granted to three others. As a result of which, by the end of the year there were 347 authorised sales and technical assistance companies.

The control of these companies is accomplished by examining their memorandums and contrasting them with other information and records, inspections not being necessary other than in exceptional cases.

In 2015, 300 memorandums were reviewed in relation to the activities performed by selling companies and companies providing technical assistance.

Personnel licences:

This section provides information on the licences of the personnel of nuclear and radioactive facilities, grouped by type.

a) Nuclear power plant personnel licences

As of December 31st 2015, the number of licensed workers at nuclear power plants amounted to 303: 127 holders of a supervisor licence, 157 operators and 19 with a head of radiological protection service diploma.

In 2015, the CSN granted five nuclear power plant supervisor licences, one for an operator and two for radiological protection service heads, and renewed 38 supervisor and 43 operator licences.

b) Licences for the personnel of fuel cycle facilities and facilities in the dismantling phase.

As of December 31st 2015, the number of licensed workers at the nuclear power plants amounted to 193: 108 holders of a supervisor licence, 76 operators, and nine with a head of radiological protection service diploma.

Also, seven supervisor licenses were awarded for these facilities: six department head of radiation protection licences and seven supervisor licenses. 21 supervisor licenses and 13 operator licenses were extended.

c) Radioactive facility personnel licences

As of December 31st 2015, the number of licensed workers at the radioactive facilities amounted to 13,965: 3,985 supervisors, 9,791 operators and 189 holders of a head of radiological protection service diploma.

As of the end of 2015, the total number of persons accredited to direct or operate radio-diagnosis installations amounted to 133,433: 54,002 for the management of such facilities and 79,431 for their operation.

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

- At radioactive facilities: 258 new supervisor licences, 1,069 operator licences and eight for heads of radiological protection services, as well as extending 507 supervisor licences and 1,060 for operators.

- At radio-diagnostic facilities: 66 accreditations for the management and 1,590 for the operation of such installations.

Furthermore, 907 accreditations were registered for the management of X-ray facilities for medical diagnosis purposes and 1,709 for their operation, according to reports submitted by organisations approved for the delivery of training courses homologated by the CSN.

Regarding courses for the training of the personnel of radioactive facilities, four new organisations were homologated in 2014 and in four cases previously granted homologations were modified. In the case of courses for accreditation to direct or operate radio-diagnostic facilities, four new organisations were homologated and the homologation granted to another 15 was modified.

In addition, the CSN conducted eight inspections of accreditation courses to staff medical radio-diagnosis facilities. That same year the CSN performed eight inspections on courses corresponding the training of personnel for radioactive facilities.

Other regulated activities, including radioactive materials, equipment, devices and accessories:

In 2015, the CSN issued seven reports on the manufacturing of radioactive equipment: three in relation to equipment for the inspection of packaged and unpackaged products of the company Multiscan Technologies; two for research

teams in small animals of the company Sedecal; one for aircraft components containing sealed radioactive sources with activities performing under the exemption limit of the company Airbus Military; and one for process control equipment with radioactive source of the company TI-Systems.

In 2015, the CSN has issued 24 favorable reports, 20 amendments and four new authorisations for the approval of 44 models of radioactive devices. The highest number of approved models, which are 20, correspond to X-ray equipment for instrumental analysis (G / AI), 13 models for the inspection packaged or unpackaged products, on the process line (G/CP IE/INE), one model was for other radiographic techniques (G/TC), seven systems for the inspection of packages (G/IB) to identify of explosives, weapons, drugs, etc., three for the inspection of cabin products (electronic circuits and others) (G/IP), and one for irradiation equipment of samples or small pieces.

Two reports to file the proposal were also conducted, due to not being able to end the authorisation procedure.

With regards to the commercialisation and technical assistance regulated by article 74 of the Regulation on Nuclear and Radioactive Facilities, in 2015 the CSN reported on the authorisation of 13 new sales and technical assistance companies and the modification of the authorisations granted previously to another three. At the end of the year, the number of authorised sales and technical assistance companies amounted to 347.

4.7. Transport of nuclear and radioactive materials

The transportation of radioactive material is regulated in Spain by a series of regulations on the transportation of dangerous goods by road, rail, air and sea, via which refer to international regulatory agreements based on the Regulations for the Safe Transport of Radioactive Materials of the International Atomic Energy Agency. Safety in transport depends mainly on the safety of the packaging.

The activities of licensing in this field include: approval of package design for transport, transport authorisations required by the regulation of the transport of dangerous goods, authorisations for physical protection and registration of organisations which carry out transport activities requiring measures of physical protection, and authorisations for shipments of radioactive waste.

Throughout 2015, CSN reported 11 files regarding the licensing of transport:

- Four reports on approval certificates of transport packages from abroad.
- Three reports on authorisations under special arrangements of the transport of disused cobalt therapy units to the Enresa's radioactive waste storage facility in El Cabril (Cordoba).
- A report on a specific authorisation for physical protection of solid waste with natural uranium or enriched uranium with less than 5% enrichment from Enusa (Juzbado) bound to Kazakhstan.
- A report on shipment authorisation of the radioactive waste generated from the cleanup and review operations of the two motors of the reactor pump of the Almaraz I NPP from Areva Soamanu (France) to Almaraz NPP.
- Two reports on registration of organisations which carry out transport activities requiring physical protection measures.

Throughout 2015, 62 specific inspections on transport were performed: 16 by the CSN itself and 46 on the services that carry out functions

assignments in the autonomous communities. In addition to these specific inspections on transport, the applicable transport requirements of radioactive material had been controlled within the inspections at radioactive facilities which include transport between their activities.

The inspections ensure that the control process is completed after the reception and analysis of the notifications required by the CSN for the transport of fissile materials, high-activity radioactive sources and waste, as well as the subsequent performance reports.

During 2015, a total of 64 shipments of fissile material were sent. It should be emphasised that radioactive waste transport operations were carried out by Enresa and its facility at El Cabril, with a total of 187 shipments of waste from nuclear facilities (164), and radioactive facilities (23).

In 2015, there have been five events in the transport of radioactive material, however none of them had any radiological consequences for people or the environment. Two of them were caused by a break in the road in the process of preparation of the package, one in a road accident where one of the packages were not marked and labelled in accordance with the levels of radiation and real content, and the latter by forgetting two empty packages designated as excepted bulks in a gas station.

All of them were classified under the IAEA's International Nuclear Event Scale (INES) as level 0 event, i.e. off-scale, meaning it did not pose a threat. Finally, in 2015 there were 159 workers exposed to radiation who developed it in the field of transport, of which 57 received significant doses (greater than zero). If we consider only significant non-administrative doses, the dosimetry results shown that the collective dose was 186.46 mSv/person, and the individual average dose was 2.14 mSv/year, which represents a rate of 4.28% over the maximum annual dose allowed in the regulations.

4.8. Activities and facilities not regulated by the nuclear legislation

Withdrawal of unauthorised tadioactive material

Throughout the year, the CSN reported on 39 proceedings authorising the transfer to Enresa of unauthorised radioactive sources and various other materials. In 27 of these cases the applicant was not authorised as a radioactive facility, and the other applicants were the licensees of facilities. Five of these reports were drawn up within the framework of the functions assignment agreement with Catalonia, two within the framework of the functions assignment agreement with Basque Country, and one with the agreement with the Balearic Islands.

Withdrawals of detected radioactive material in metallic materials

As of December 31st 2015, the number of metallic materials treatment and management companies adhering to the *Protocol for collaboration in the radiological surveillance of metallic materials* amounted to 167.

As a result of the application of the protocol in 2015, in 80 cases radiation was detected in metallic materials and was communicated to the CSN. The detected radioactive materials were: sources, indicators with radio-luminescent paint, ion smoke detectors, radioactive lightning rods, pieces of uranium, products containing radio and thorium, and contaminated parts. These materials were transferred to Enresa for management as radioactive wastes, or they are still being analysed before they are transferred.

Facilities affected by the smelting of radioactive sources

During 2015 there were no incidents relating to the smelting of radioactive sources.

5. Radiological protection of professionally exposed workers, the public and the environment

5.1. Radiological protection of workers

The control of the radiation doses received by professionally exposed workers is mainly accomplished through individual monitoring by means of passive physical dosimeters. If the radiological risk is sufficiently low, there are cases in which, the doses are determined on the basis of the results of the radiological surveillance of the areas in which these workers perform their professional activities.

In Spain the dosimetry of workers exposed to ionising radiations is regulated by the Regulation on the Protection of Health against Ionising Radiations, which establishes that individual dosimetry is to be undertaken by personal dosimetry services expressly authorised by the CSN.

The number of workers whose dosimetry is controlled and that properly changed their dosimeters was 108,184. Their collective dose was 18,297 mSv/person.

Considering only the significant doses and excluding potential cases of the annual dose limit being exceeded, the individual average dose of these workers amounted to 0.76 mSv/year.

It should be noted that although the top value of effective dose allowed by the regulation any year is 50 mSv:

- 77.77 % of the workers whose dosimetry was controlled (84,138) had no dose of radiation.
- 96.08% of the workers whose dosimetry was controlled (103,946) had a dose of radiation less than 1 mSv/year.
- 99.65% of the workers whose dosimetry was controlled (107,800) had a dose of radiation less than 6 mSv/year.
- 99.99% of the workers whose dosimetry was controlled (108,173) had a dose of radiation less than 20 mSv/year.

This distribution shows the good trend of the nuclear and radioactive facilities of our country in relation to the fulfilment of the dose limit (100 mSv for five years) established in the regulation on health protection against ionising radiation.

During the year 2015 there were two cases of potential improvement of the annual dose limit set out in the legislation, both in radioactive facilities, which started a research process.

At the end of the year 2015, the National Dosimetry Bank contained 22,168,290 dosimetric records, corresponding to 346,659 workers and 70,238 facilities. Each of these registers contains the information required to identify the worker, the installation and the labor sector in which the worker carries out their activity, and the type of work performed by the worker.

Table 5.1.1 summarises the dosimetry information (number of workers, collective dose and average individual dose) for each of the occupational sectors considered in this report, while figures 5.1.1 and 5.1.2 show the collective dose and average individual dose values in these sectors.

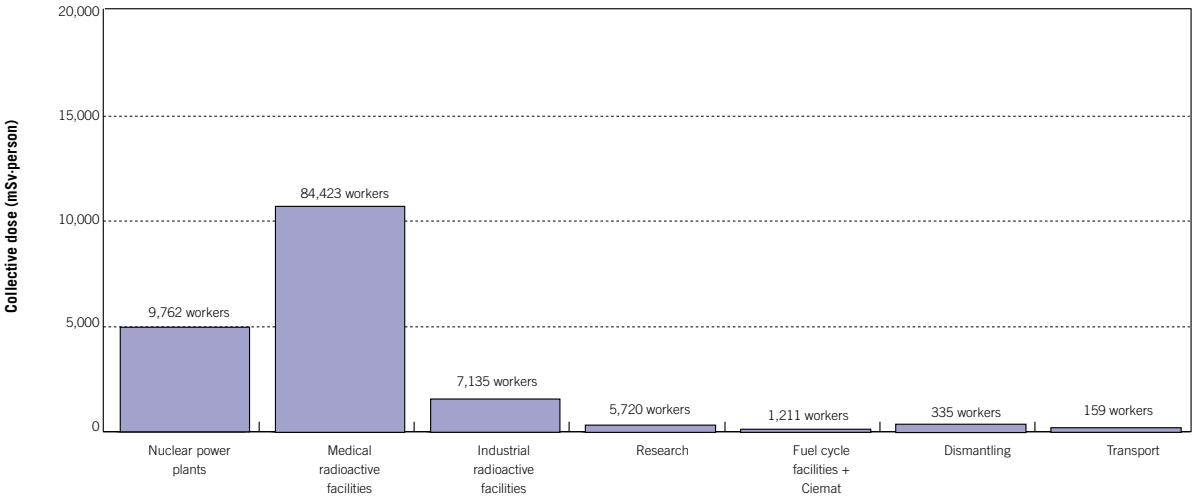
The analysis of the above-mentioned data shows:

- The records show that the medical radioactive facilities have the most elevated collective dose (10,786 mSv/person). It is logical if we consider

Table 5.1.1. Doses received by the workers in each of the sectors considered in the Annual Report

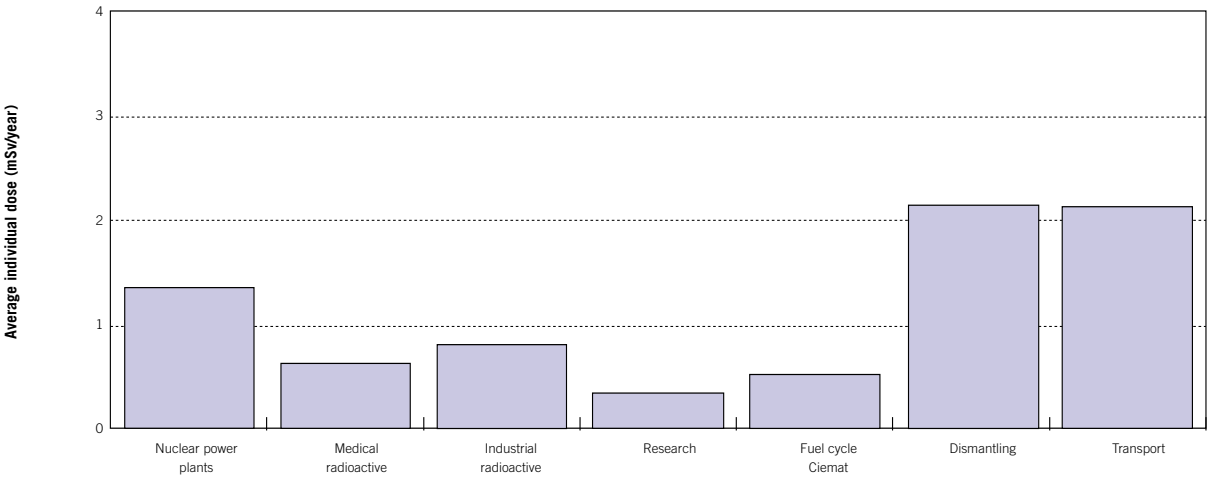
Facilities	Number of workers	Collective doses (mSv·person)	Average individual dose (mSv/year)
Nuclear power plants	9,762	4,863	1.34
Fuel cycle and waste storage and disposal facilities and research centres (Ciemat)	1,211	88	0.53
Radioactive facilities			
Medical	84,423	10,786	0.63
Industrial	7,135	1,577	0.81
Research	5,720	359	0.32
Facilities in dismantling and decommissioning phase	335	438	2.15
Transport	159	186	2.14

Figure 5.1.1. Collective dose and number of professionally exposed workers by sectors. 2015



that these facilities have the largest number of workers exposed to radiation (84,423). The greatest contribution to the collective dose of all exposed workers of the country corresponds to medical radioactive facilities, with 67% of the global collective dose, since the number of exposed workers in the sector accounts for 77% of the total.

Figure 5.1.2. Average individual dose by sectors. 2015



- The facilities undergoing decommissioning and closure have a higher average individual dose (2.15 mSv/year), but similar to the corresponding dose in transport activities.

- Compared to the doses in the operating nuclear power plants, it should be noted that the number of dosimetry records of workers exposed was 9,762 with a collective dose of 4,863 mSv/person and an average individual dose of 1.34 mSv/year. For the personnel (2,119 workers), the collective dose was 584 mSv/person and the average individual dose was 1.05 mSv/year, and for contracted personnel (7,727 workers) the collective dose was 4,279 mSv/person and the average individual dose was 1.39 mSv/year[2].

- With regards to internal dosimetry, controls were performed through the direct measurement of body radioactivity in all workers running a significant risk of incorporating radionuclides, and there wasn´t acase where values were detected in excess of the recordinglevels established (1mSv/year).

- Table 5.1.2 lists the operational collective doses of nuclear power plants where refuelling outages were performed in 2015.

Figures 5.1.3 and 5.1.4 show the temporal evolution of the three-year average collective dose by type of reactor for the Spanish nuclear power plants, and is compared with the values recorded in the international arena.

To assess the obtained results, the following must be taken into account:

- Pressurised water reactors (PWR):

  During the three-year period 2013-2015, there was a decrease in the three-year average collective dose per reactor in the Spanish nuclear power plants. In the year 2015, four stops for refuelling took place in Almaraz II, Vandellós II, Ascó I and Trillo nuclear power plants.

[2] Data from the National Dosimetry Bank that shows the fact that there are contracted workers who perform activities in more than one nuclear power plant. Subsequently, the total number of workers in this sector does not match with the total number of workers in each NPP.

Table 5.1.2. Operational collective dose per refuelling outage. 2015

Nuclear power plants	Collective dose (mSv.p)[1]	Collective dose (mSv.p)[2]	Average individual dose %[3]
Almaraz II	553.22	436.86	79
Ascó I	658.69	498.73	76
Cofrentes	3,394.47	2,203.00	65
Vandellós II	809.76	784.32	97
Trillo	361.74	247.47	69

(1) Average figure for collective dose in the refuelling outages during the period 2005-2014.
(2) Operational collective dose during the 2015 refuelling outage.
(3) The value represents the percentage of the operational collective dose during the 2015 refuelling compared to the average for the period 2005-2014.

Figure 5.1.3. Three-year average collective dose for PWR reactors. International comparison

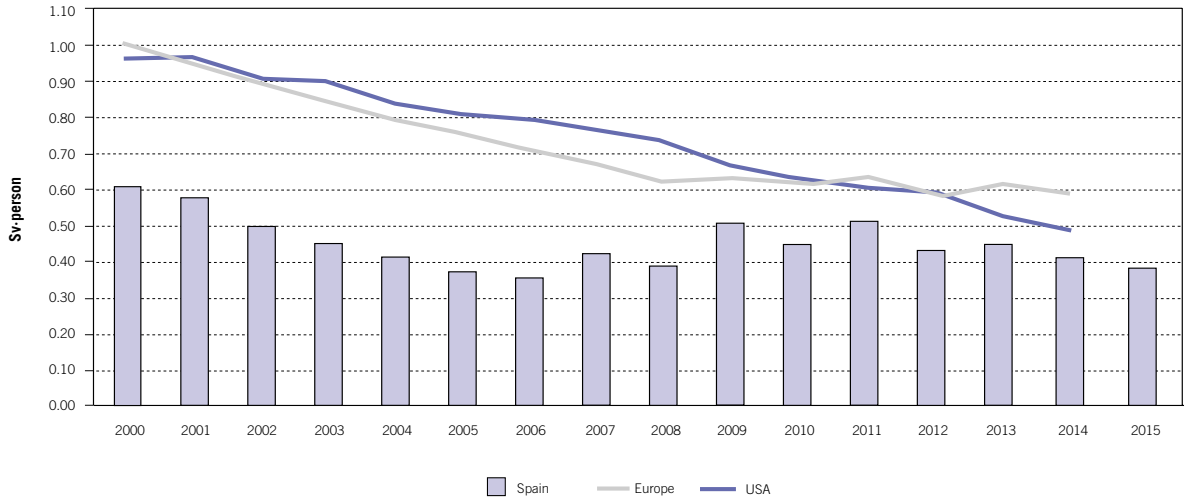
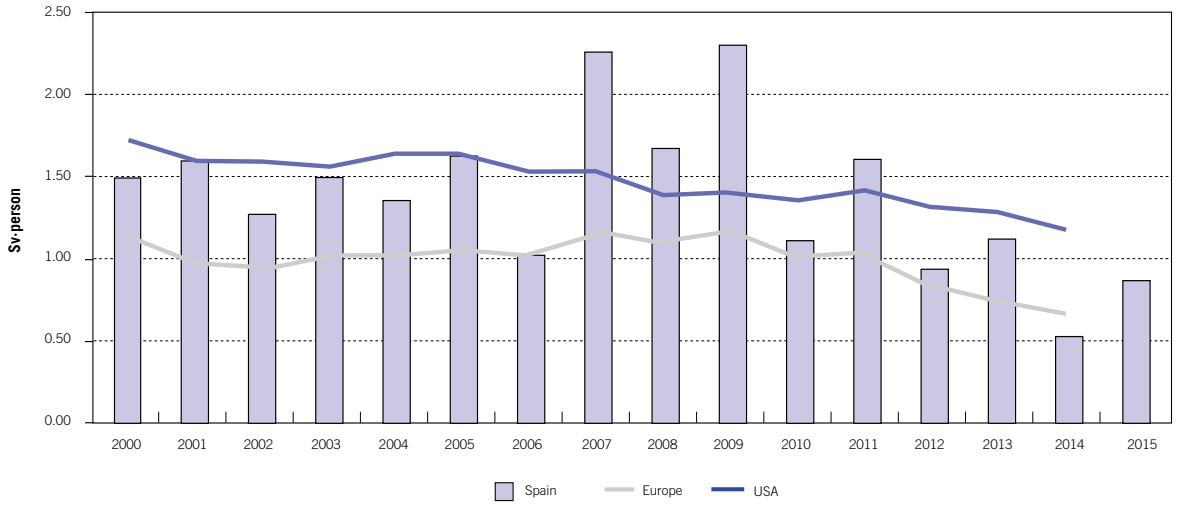


Figure 5.1.4. Three-year average collective dose for BWR reactors. International comparison



The situation of occupational doses in the Spanish nuclear power plants with this technology still shows lower values than those presented by the European nuclear plants of the same technology in the three-year period of 2012-2014 (latest available data), and slightly lower than those presented by the American power plants.

- Boiling Water Reactors (BWR):

  The three-year average collective dose for BWR reactors in the three-year period of 2013-2015 turns out to be higher than in the previous period, since in this three-year period Cofrentes was refuelled two times, while in the three-year period that ended in 2014, it was refuelled only once. The other existing BWR power plant is Santa María de Garoña, which shutdown in December 2012.

  The average collective dose of the Spanish BWR plants in the 2013-2015 three-year period is lower than the latest available data of the average dose of the US nuclear power plants, and higher than data available of the European ones (2012-2014 three-year period).

5.2. Control of releases and environmental radiological surveillance

Control of effluents

In 2015, the liquid and gaseous radioactive releases from the facilities remained within the usual values and are comparable to those experienced at the European and US facilities, as shown by the monitoring performed and the records kept. As in previous years, the calculated doses attributable to these releases were far below the regulatory dose limits for the public and represent only a minor fraction of the release limits. In the specific case of nuclear power plants, this fraction does not exceed 4% of the authorised limit (0.1 mSv in 12 consecutive months).

Radiological surveillance around the f≠acilities[3]

In 2014, 6,258 samples were taken from the areas surrounding the operating nuclear power plants within the framework of the environmental radiological surveillance programmes of these facilities, 1,964 at the fuel cycle facilities and 1,943 at the facilities in the dismantling and decommissioning phase, including Ciemat, the José Cabrera and Vandellós I nuclear power plants, and the now decommissioned Lobo-G plant, as indicated in tables 5.2.1 and 5.2.2.

Table 5.2.1. Environmental radiological surveillance programmes: number of samples per operating plant in 2014

Sample type	Garoña	Almaraz	Ascó	Cofrentes	Vandellós II	Trillo
Atmosphere	466	781	849	779	829	780
Water	192	188	128	142	130	150
Food	109	288	121	103	106	117
Total	767	1,257	1,098	1,024	1,065	1,047

[3] This report show the results of the 2014 Environmental Radiological Surveillance Programme (ERSP). This is due to the processing and analysis of samples that do not allow to include the 2015 campaign results in the same year report.

Table 5.2.2. Environmental radiological surveillance programmes: number of samples at fuel cycle facilities and installations in the definitive shutdown, dismantling and decommissioning phase in 2014

Facility	Juzbado	Cabril	Ciemat	Quercus/Elefante	José Cabrera	Vandellós I	AUM	LoboG
No samples	611	750	730	652	805	332	51	45

All these results are similar to those of previous years and allow us to conclude that the environmental quality around the facilities is kept in acceptable conditions from the radiological point of view, without any risk to the persons exposed because of their work or involvement in the dismantling and/or closure.

Radiological surveillance of the national territory

The CSN also controlled the environmental radiological quality in the national territory through:

Sampling Stations Network (REM)

Its atmosphere and terrestrial environment monitoring programme consists of a total of 20 laboratories that analyse samples of river and coastal waters, the atmosphere, the terrestrial environment, and food. This network operates in two modes: the so-called dense network analysing large numbers of samples in many locations throughout the territory, and the network that analyses few samples but with great precision.

The overall assessment of the results obtained shows that the values ??are consistent with the levels of background radiation and generally remain relatively stable over the different periods, showing slight variations between points in relation to radiological characteristics typical of different areas.

Automatic Stations Network (REA)

Established by the CSN network, there are 25 stations distributed throughout the national territory and networks of autonomous communities of Catalonia, Valencia, Extremadura and the Basque Country. Its aim is the uninterrupted measurement of gamma dose rate, concentrations of radon, radio-iodines, and alpha and beta emitters in the air.

During 2015, specific connection agreements between the CSN network and automatic radiation monitoring networks of the aforementioned regions were successfully made. The results of the measures carried out were characteristic of the environmental radiological background and indicated the absence of radiological risk for the population and the environment.

In 2015, the Plenary of the Council approved the proposed functional design of the new network of automatic stations integrated into the Environmental Radiological Surveillance Network (Revira), whose implementation project will cover the period 2016-2018.

The future network that will replace the current criteria will be based clearly on emergency management, and should be operational to major disasters such as the Fukushima accident. The information provided by the network will assess the severity of the radiological consequences of the accident and help the decision-making on measures to protect the population. The new sensors that make up the network does not need consumables to operate, simplifying the work and keeping the maintenance costs low.

Inter-comparison campaigns and standardisation of procedures

The CSN carries out an annual programme of analytical inter-comparison exercises, with

technical support from Ciemat, in which 30 laboratories perform measurements of low activity in order to guarantee the quality of the results obtained in the environmental monitoring programs.

The campaign launched in 2014, with an ash plant with natural and artificial radionuclides distributed to participants as subject of study, prepared in the Laboratory of Materials Preparation for Quality Control (Mat Control) in collaboration with the Laboratory of Environmental Radiology, department of Analytical Chemistry at the University of Barcelona. It concluded in 2015 and there were 39 laboratories involved.

In November 2015, at the headquarters of CSN, the twenty-second day on environmental monitoring was held. The participants were presented in the campaign evaluation results by the CIEMAT, which came to a general conclusion that the laboratories involved have the capacity to make measurements of natural and artificial radionuclides in plant samples with a low levels of radioactivity at a satisfactory quality level.

Also in 2015, a new campaign was launched in which two types of water (consumption and marine water) with natural and artificial anthropogenic radionuclides were distributed to participants as the subject of study, prepared at Mat Control in collaboration with the Laboratory of Environmental Radiology, department of Analytical Chemistry at the University of Barcelona. There were 44 laboratories involved in the assessment of the results obtained by the participants.

Surveillance at the site of the former Lobo-G plant

The former Lobo-G uranium ore treatment plant was decommissioned by the Order of the Ministry of Industry, Trade and Tourism of August 2nd 2004. The mining and process tailings generated during operation of the plant have remained duly stabilised in a fenced off and signposted enclosure, under institutional surveillance, temporarily assigned to ENUSA as the organisation formerly responsible for the facility.

Within the environmental radiological surveillance programme carried out by the facility in 2014, approximately 45 samples were taken and some 69 analyses were performed, underlining the absence of any significant radiological impact to the population[4].

During 2015, two inspections were performed to verify compliance with the general conditions and the environmental radiological surveillance imposed upon the site of the former plant. No significant deviations from the established programme were found.

5.3. Protection against natural radiation sources

Title VII of the Regulation on the Protection of Health against Ionising Radiations imposes upon the licensees of occupational activities involving natural radiation sources the obligation to declare these to the competent authority in order for them to be included on a register, and for the performance of a study of their radiological impact.

This regulatory framework must be revised and expanded to suit the requirements of Directive 29/2013/Euratom, which is being transposed into our national legislation. In this context, it has continued the development of guidelines and procedures in order to make it easier to conduct

[4] This report show the results of the 2014 Environmental Radiological Surveillance Programme (ERSP). This is due to the processing and analysis of samples that do not allow to include the 2015 campaign results in the same year report.

the studies required by regulation for the workers responsible for different activities.

Moreover, a series of works that form the technical basis for the future National Action Plan against radon will be included. This plan, which will be coordinated by the Ministry of Health, Social Services and Equality, should be established in Spain in compliance with the Directive.

The Ministry of Public Works will further collaborate with the aim of establishing the Technical Building Code, a system of gradual protection against radon in rehabilitated and newly constructed buildings. In order to solve a number of technical difficulties in measuring radon in the ground, and analyse the robustness and applicability of this technique in Spain, in November 2015 the CSN signed a specific agreement of collaboration with the following universities: Autonomous University of Barcelona, Cantabria, Las Palmas, and Polytechnic University of Catalonia.

To progress in the regulation of radon, we have kept an intense international cooperation with other European countries with experience in this area. The CSN has collaborated in the writing of a European position paper on the modification of Directive 2013/59 with regards to radon.

6. Tracking and control of the management of irradiated fuel and radioactive aaste

6.1. Irradiated fuel and high level radioactive waste

The spent nuclear fuel generated in Spain (with the exception of that generated during the operation of Vandellós I nuclear power plant, and at Santa María de Garoña up to 1982), is currently held in the fuel storage pools associated with the reactors and in dry storage casks at the Individual Temporary Storage (ATI) facilities at the sites of the Trillo, Jose Cabrera, and Ascó plants.

In addition to the waste arising as a result of the reprocessing in France of the fuel from Vandellós I, the category of high level waste includes those produced during the operation and decommissioning of nuclear power plants and that, in view of their activity, do not meet the criteria for disposal at the El Cabril facility, these being grouped under the class of "special waste".

Inventory of irradiated fuel and high level waste stored at the nuclear power plants

As of December 31st 2015, the number of fuel assemblies stored at the nuclear power plants amounted to 14,790, of which 8,053 were from pressurised water reactor (PWR) plants and 6,737 were from boiling water reactor (BWR) plants. Of these:

- 13,1495 fuel elements are stored in the pools at the respective plants.
- 1,125 assemblies are in dry storage casks at the ATS facilities at: Trillo (630 assemblies in 30 ENSA-DPT type casks); José Cabrera (377 assemblies in 12 HI-STORM type casks), and Ascó (160 assemblies in 5 HI-STORM type casks).

Table 6.1.1 shows in detail the inventory of the spent fuel stored in the spent fuel pools at nuclear power plants and, in this case, in the existing ATI facility on December 31st, 2015. There is information on each nuclear power plant's total capacity and useful capacity (total capacity without the reserve capacity to house a core), the occupied capacity (number of stored fuel elements), the degree of saturation, regarding the free capacity, and the year of pool saturation provided for current operation cycles.

Throughout 2015, the CSN performed three inspections to control the management of spent fuel and high-level waste or special waste, without significant deviations in the Almaraz, Cofrentes, and Santa María de Garoña nuclear power plants.

6.2. Low and intermediate level radioactive waste

Nuclear power plants

In 2015, the operating nuclear power plants generated solid low and intermediate level radioactive waste with an estimated activity of 25,607.79 GBq, conditioned in 3,087 packages. Table 6.2.1 breaks down the generation of packages of each facility and relocations to El Cabril in the year 2015.

Figure 6.2.1 shows the percentage of each facility of the total number of radioactive waste packages generated by the operating nuclear power plants in 2015.

Figure 6.2.2. shows the percentage of waste generated from activities by each facility in 2014.

Table 6.1.1.1. Inventory of irradiated fuel and situation of the Spanish nuclear power plants storage facilities at the end of 2015

Nuclear power plant	Total capacity	Core reserve	Effective capacity	Occupied capacity	Free capacity	Degree of saturation	Year of pool saturationn
	Number of irradiated fuel elements					%	
José Cabrera (p)	NA	NA	NA	NA	NA	NA	NA[1]
ATI Jose Cabrera	377	NA	NA	377	0	100%	NA[1]
Santa María de Garoña (p)	2,609	NA[2]	NA[2]	2,505[2]	104	96.01[2]	NA[2]
Almaraz I (p)	1,804	157	1,647	1,392	255	84.52	2020
Almaraz II (p)	1,804	157	1,647	1,380	267	83.79	2022
Ascó I (p)	1,421	157	1,264	1,228	36	97.15	NA[4]
Ascó II (p)	1,421	157	1,264	1,104	160	87.34	NA[4]
ATI de Ascó (f)	1,024	NA	1,024	288	736	28.13	–[4]
Cofrentes (p)	5,404	624	4,780	4,232	548	88.54[3]	2021
Vandellós II (p)	1,594	157	1,437	1,148	289	79.83[3]	2021
Trillo (p)	805	177	628	506	122	80.58	NA[4]
ATI de Trillo (f)	1,680	NA	1,680	630	1,050	37.50	–[4]
Total (P)	16,862		12,667	13,495	1,781	87.23	
Total ATI(f)	3,081		3,081	1,295	1,786	32.81	

(p) Pool (f) Flask

Explanation of the table

– *Total capacity* or number of positions in the pool.

– The *core reserve* or positions in the pool, reserved for fuel elements of a complete reactor core load if necessary.

– *Effective capacity*, or useful storage capacity of pools (equal to the total capacity less the capacity for a full core reserve).

– *Occupied capacity*, which corresponds to the number of irradiated fuel assemblies stored in the pool as of December 31.

– *Free capacity and degree of occupation*, on said date, both referring to the effective capacity, keeping the reserved capacity for a core (condition for the operation of power plants).

– *Saturation date* (estimation based on the current operation cycles): referring to the year when the last possible refuelling in which the effective capacity of the pool would be completed, being the power plant still operating until the end of the cycle by keeping the core reserve.

(1) The total of the spent fuel stored in the pool of José Cabrera (377 items) is located in 12 HI-STORM storage casks located in the Individualised Temporary Storage (ATI), which has capacity for 16 storage casks, 12 of them for spent fuel and four for special waste, and has reached 100% of the capacity provided for this purpose.

(2) The pool of Santa María de Garoña nuclear power plant, with the complete unload of the core in December 2012, has an occupation rate of 96.01%, with 104 positions currently available.

(3) The calculation of the degree of occupation of the pools of the Almaraz, Cofrentes and Vandellós II plants refers only to positions occupied by fuel assemblies, not positions occupied by other materials and useable positions.

(4) At the Ascó and Trillo nuclear power plants, the saturation of the pool has not been considered since there is an ATI in both (one with capacity of 32 HI-STORM 100 type casket Ascó and one with 80 type PTD in Trillo).

Table 6.2.1. Packages of radioactive waste generated in operating nuclear power plants and transferred to El Cabril during 2015

Facility	Generated waste packages	Waste packages transfered to El Cabril
Santa María de Garoña	342	510
Almaraz I and II	441	114
Ascó I and II	552	345
Cofrentes	1,152	961
Vandellós II	389	240
Trillo	211	168
Totals	3,087	2,338

Figure 6.2.1. Distribution of the 3,087 packages of conditioned radioactive waste generated at the operating nuclear power plants in 2015

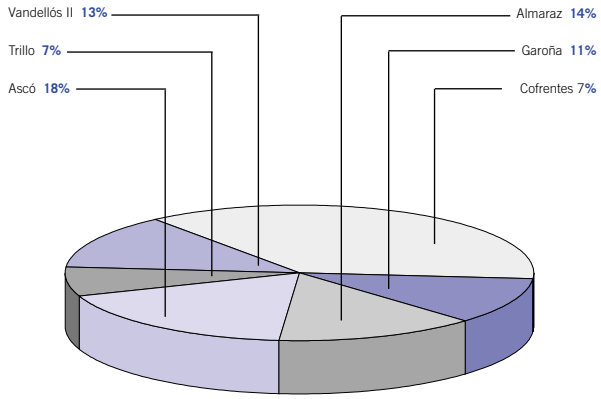
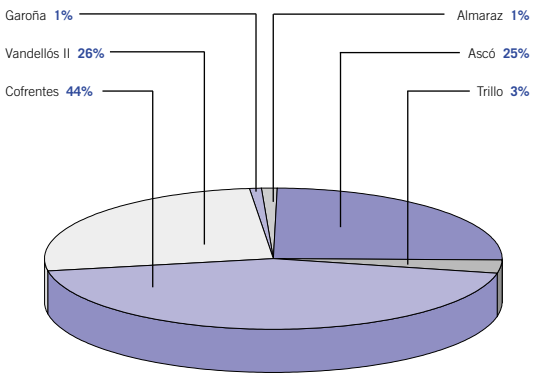


Figure 6.2.2. Distribution of the activity contained in the packages of radioactive waste generated at the operating nuclear power plants in 2015



6.3. Very low level waste

Nuclear power plants' waste

Very low level waste is generated in all nuclear power plants and in the end is all managed in a specific facility for its definitive storage in the El Cabril centre. The management of waste at nuclear facilities is done similarly as with the low and intermediate-level radioactive waste, however the packaging must comply with different acceptance criteria. In 2015 a total of 2,338 packages evacuated to El Cabril.

Waste generated in restoration activities at uranium mines

Quercus plant waste

Process waste

On the static leaching bed of the Quercus plant, around 1,107,896 tonnes of depleted uranium with sizes of less than 15mm have accumulated. Likewise, some 941,338 tons of neutralisation sludge has accumulated in the plant's tailings dyke.

Water treatment waste

Waste is currently generated as a result of the treatment of non-releasable acid waters generated on the site, a result of surface runoff from the rainfall and infiltrations water. The treatment and conditioning of liquid effluents continued in 2015. The operation of the treatment and discharge section has continued correctly with no incidents; the discharge of effluent stopped on November 19th 2015, as planned.

In 2015, 235,485 m^3 of water was discharged. In the process, a total of 4,439 tonnes of waste was generated in the form of precipitate cakes, deposited in the crown of the static leaching bed. The total waste of this type that had accumulated at the end of 2015 amounted to 48,680 tons.

Both water treatment residues and process residues are waiting for final disposal, as provided in the new Quercus plant dismantling project.

6.4. Clearance of waste

The Spanish nuclear facilities are authorised for the clearance of waste materials with low radioactivity contents, in order to be able to manage them along conventional routes. These are understood as those routes that are not subject to radiological regulatory control, without prejudice to the legal framework applicable to them in view of their specific characteristics and nature.

No new authorisation for clearance was issued by the competent authority in 2015.

6.5. Disused consumer goods

The management of radioactive lightning rod headers is considered one of the disused consumer goods. The Directorate-General for Energy Resolution of June 7th 1993 authorised Enresa for the management of said headers. The retired lightning rods are sent to the Ciemat, where the radioactive sources are disassembled and sent to the United Kingdom.

In 2015, 73 lightning rods were withdrawn, which makes a total number of 22,801 withdrawn. This year, Americium-241 sources have not been sent to the United Kingdom. The total number of sources sent to the UK is 59,796.

7. Nuclear and radiological emergencies: physical protection

7.1. Nuclear Safety Council emergency response capacities and actions

7.1.1. Emergency room

The CSN has an Emergency Response Organisation (ORE) that guarantees the manning of the emergency room (Salem) 24 hours a day, 365 days a year, with a stand-by emergency team made up of 14 technicians who would report to the Salem in less than one hour when activated.

In 2015, the CSN finished writing and updating the provisions for the *Emergency Action Plan*, at the same time as the provisions related to the National Emergency System.

Throughout 2015, an application to visualize the Salem Registry Book (LOS) on a mobile phone has been developed and launched.

7.1.2. National and international exercises and drills

In 2015, the CSN participated in five IAEA exercises: ConvEx-2a (March 18th), ConvEx-1c (April 14th), ConvEx-1a (July 28th), ConvEx-1b (November 16th) and ConvEx-2c (December 15th).

The European Commission has the ECURIE (European Community Urgent Radiological Information Exchange) system for the early exchange of notifications and information on radiological emergencies in the European Union countries. During 2015, the European Commission has conducted four communication tests with Salem to check its availability as the Spanish contact point for the ECURIE system.

Salem participated in the ECURIE exercise on October 13th and 14th, in the context of a Romanian national exercise, by developing a simulation of the Cernavoda nuclear power plant releasing radioactive material into the atmosphere. Following the exercise instructions, the sending of data from the radiological surveillance networks in emergency mode was activated and data started sending every hour from the Spanish automatic radiation measurement station to the Eurdep (European Radiological Data Exchange Platform). The proper operation of the Eurdep website was confirmed, where there is access to the radiological data of the European radiological surveillance stations.

Throughout 2015, in Spain there were different exercises of the Radiological Group on activities of the five nuclear external emergency plans, related mainly to radiological controls access (CA), and classification and decontamination stations (CDS).

Some of these exercises were performed in collaboration with other operating groups of external plans, such as the access control exercises of the Public Order and Safety Groups, and classification and decontamination exercises with the Health Group and Municipal Organisations. Additionally, on several occasions there were training sessions for the group participants prior to the exercises.

In addition, eleven emergency drills were carried out on the schedule and in the arranged localisation, as part of the nuclear facilities' Emergency Plans.

7.1.3. Tracking of Incidents

During 2015, the CSN Emergency Response Organisation was activated on one occasion as a result of a real incident. On March 13th, packages identified with possibly mistaken radioactive identification were detected at Barajas Airport and

taken to a CSN inspector for radiological measurement, to check the status of packages and the in-transit storage.

Throughout the year, several notifications have been received in Salem related to accidental overexposure of workers due to the wrong supply of radio-pharmaceuticals to patients, due in turn to a failure or deterioration of the equipment with radioactive sources, or accidents or incidents during the transport of radioactive packages. There were no significant radiological consequences in any of the cases.

In 2015, Salem received a warning message from the European Union's Ecurie stating that in the Lisbon port contamination of Cs-137 was detected in an empty flask from Casablanca.

In addition, there were 18 notifications or reports of international radiological incidents that happened in 2015 from the IAEA's USIE website. Most of these incidents were related to the overexposure or contamination of workers, robberies, disappearances, loss and findings of radioactive sources.

7.2. Nuclear Safety Council participation in the national emergencies system

The document 'Participation of the CSN in the National Civil Defence System' includes the Services Charter of the organisation in relation to its collaboration in the preparation for, planning of, and response to nuclear and radiological emergencies.

The most significant of the CSN's activities during 2015 were:

- The CSN kept the National Catalogue of Facilities and Activities entailing Radiological Risks updated.
- The CSN developed the State Radiological Risk Plan, as established by the Basic Directive, which was finally approved by the Ministry of Interior in November of that year.
- The CSN now has radiological emergency collaboration agreements signed with the following regional governments: Extremadura, Catalonia, Castille and Leon, Galicia, Madrid, Castilla-La Mancha, the Balearic Islands, Navarre, Valencia, the Basque Country and Murcia.

7.3. On-site emergency plans

The CSN participated in and supervised the drills included in the site emergency plans of the nuclear power plants.

Regarding nuclear power plants, in this period a proposal for the revision of the PEI was sent, in which the most significant change is the analysis and adequacy of the human resources and materials allocated to the Emergency Response Organisation (ORE), according to the methodology guide of UNESA CEN-33-25 Rev. 0. This analysis assesses the ability of the licensee to manage and mitigate events caused by extreme external events beyond the design basis, and potential events causing extensive damage to the entire site.

In addition, during 2015 the CSN has reviewed the On-site Emergency Plans (PEI) and the storage facility for solid radioactive waste in El Cabril and all nuclear power plants, content included in the corresponding report for Minetur.

7.4. International collaboration in emergencies and other collaborative activities

During 2015, collaboration continued with the competent international authorities in accordance

with Article 7 of the IAEA's Convention on prompt notification (Group of Competent Authorities of the Convention on Prompt Notification and Assistance).

The CSN participated in the two-yearly meeting of the competent authorities of ECURIE (European Community Urgent Radiological Information Exchange) and in the meeting of EURDEP (European Radiological Data Exchange Platform), a platform created to make easier the transmission and exchange of European radiological surveillance from automatic networks.

In 2015, a Technical Cooperation Protocol was collaborated on between the CSN, the Environment Agency, the National Authority for Civil Protection and Nuclear and Technological Institute of Portugal, for the exchange of information in cases of nuclear or radiological emergency with cross-border implications or signed transnational and environmental radiation protection.

In 2015, the CSN actively participated in the working groups associated with the management of nuclear emergencies of various international organisations (IAEA, OECD-NEA and international associations of regulators: ENSREG, WENRA, HERCA).

7.5. Physical protection of nuclear materials and facilities

On December 18th 2015, the Royal Decree 1086/2015, of December 4th, was published. It partially amends the Royal Decree 1308/2011, of September 26th, on physical protection of nuclear facilities, nuclear materials, and radioactive sources. This modification was made to coordinate the physical protection plans and specific protection plans of nuclear facilities. The latter are required as a complement to the first under the legislation and regulations currently in force on critical infrastructures protection: it plays an important role, composed by members of the Spanish military police inside nuclear sites and regulating the incorporation of the nuclear power plants, spent fuel and high level waste storage facilities. Prior to this, the Design Basis Threat must be approved by a resolution of the Secretary of State for Security.

The CSN has issued a Complementary Technical Instruction to the licensees of the physical protection authorisation of the nuclear power plants, regarding limits protection and its protected area.

In 2015, the Base Inspection Programme (PBI) was applied within the strategic area of physical security of the Control System and Integrated Plant Supervision System (SISC) of the CSN. The goals of the PBI has been met as planned, with a total of six inspections at the Almaraz (II), Ascó, Cofrentes, Trillo and Vandellós nuclear power plants. Three of these inspections have been carried out by the CSN and the Ministry of the Interior together. Likewise, within the specific integrated supervision programme established for the Garoña nuclear power plant, another inspection was carried out.

According to its own monitoring plan, an inspection to check the physical security of ENUSA's Juzbado fuel assembly manufacturing facility (Salamanca) was carried out.

In December 2015, the sixth meeting of the Technical Commission for Monitoring the Specific Agreement signed between the Ministry of Interior and the CSN on physical security of facilities, activities, and nuclear and radioactive materials took place.

During 2015, the CSN participated in the National Commission on Critical Infrastructure Protection and the Interdepartmental Working Group on Critical Infrastructure Protection,

management, analysis and approval of the Strategic Plan of the Nuclear Sector, in the designation of Critical Operators of this sector and the adoption of Security Plans made by the operators.

In the international arena, the CSN has continued as usual cooperating closely with international organisations, keeping bilateral and multilateral agreements with other regulatory bodies in this respect from other countries.

The CSN keeps a bilateral relationship with the NRC on nuclear security. The fifth bilateral meeting was held, in which CSN technical experts in physical security attended a USNRC meeting for safety inspectors from all regions in Arlington, Texas.

Nuclear Safety Council report to the Parliament

Summary of 2015

CSN CONSEJO DE SEGURIDAD NUCLEAR