Nuclear Safety Council Report to the Parliament

2020

Summary Report

CSN

CSN CONSEJO DE SEGURIDAD NUCLEAR

Published and distributed by
Consejo de Seguridad Nuclear
Pedro Justo Dorado Dellmans, 11. 28040 - Madrid - Spain
http://www.csn.es
peticiones@csn.es

Design and layout
base 12 diseño y comunicación

Printed by
CEMA, S.L.

ISSN: 1576-5237
Legal Deposit: M-29310-2010

Printed on 100% recycled paper,
with a certificate of responsible
forestry management

TABLE OF CONTENTS

TABLE OF CONTENTS (continuation)

PRESENTATION

Josep Maria Serena i Sender

President

In compliance with our institutional obligation, I am pleased to submit the Annual Report of the Nuclear Safety Council (CSN) for 2020 to the Spanish Congress and Senate. Given the consequences of the COVID-19 pandemic, this has been an exceptionally difficult year in both the professional sphere and in our private lives.

On March 14th 2020, the date of the declaration of the state of alert in Spain, we initiated a rapid digital transformation of the organisation that allowed us to continue to carry out our mission. Thus, in March 2020, 85% of our workforce changed to working remotely. This required a great effort by all the CSN workers, whom I should expressly like to recognise and thank. The teamwork and collaboration between all the CSN's different departments and professionals were undoubtedly a determining factor as regards compliance with our functions and areas of competence.

I should also like to point out that the Board of the CSN agreed to revise the structure and format of this report in order to make it easier to read, bring the stakeholders into closer contact with the functions and areas of competence of the CSN and facilitate its becoming a user-friendly and useful vehicle for consultation. We trust that we have fulfilled our objectives.

The following may be singled out as the most significant activities performed in 2020, grouped by areas:

In the **strategic-organisational** area, special mention might be made of the fact that the Board of the CSN approved the council's new Strategic Plan for the period 2020-2025 and initiated the operational start-up of the following three particularly relevant strategic projects: assessment of the CSN's safety culture, the development and implementation of a systematic approach to training methodology and the development of a digital transformation plan for the organisation. In addition, the situation brought about by the COVID-19 pandemic drove the development of a programme, or model, for the establishment of remote working at the Council, with a view to its being put into practice in 2021.

In the field of **nuclear safety**, the CSN reported favourably on renewal of the operating permits for the Almaraz and Vandellós II nuclear power plants and on incorporation of the NFPA-805 standard in the Almaraz NPP fire-fighting licensing basis. The nuclear power plants continued to operate and in this respect prevention and contingency plans were implemented in relation to the response to healthcare crisis situations and reported to the CSN.

As regards **radiological protection**, the start-up of the proton therapy facility at the Clinic of the University of Navarre in Madrid was reported. Also, work began on assessing the request for authorisation of the first phase of dismantling of Santa María de Garoña nuclear power plant. I should also like to underline the collaboration established with the Ministry for Ecological Transition and the Demographic Challenge in the drawing up of Royal Decree 451/2020, of March 10th, on the control and recovery of stray radioactive sources. Finally, it should be pointed out that in 2020 we reported favourably on the request for extension of the site permit for the uranium concentrates manufacturing facility belonging to Berkeley Minera España and located at Retortillo (Salamanca).

Institutional relations were impacted by the pandemic; nevertheless, the CSN maintained its relations with the Parliament and submitted the reports emanating from its periodic resolutions. Relations were maintained with the regional autonomous communities through mixed commissions for the tracking of functions entrusted to them, these being held remotely. Agreements were signed between several autonomous communities and the CSN, and the arrangement with the Association of Municipal Areas Housing Nuclear Power Plants and radioactive waste storage facilities (AMAC) was given the go ahead with the signing of the framework agreement.

In the field of **international relations**, activities continued, adapted to the realities of telematics. Within the European Union, the European Nuclear Safety Regulators Group (ENSREG) approved the performance of the second Topical Peer Review (TPR), in compliance with the provisions of Directive 2014/87/Euratom,

which will focus on protection against fires at nuclear facilities. Progress was made also in the technical assistance projects performed pursuant to the European Commission Instrument for Cooperation in Nuclear Safety, with the project with Morocco, led technically by the CSN, warranting special mention. As regards the Latin American Forum of Radiological and Nuclear Regulatory Bodies (FORO), the launching of a new activity relating to the resilience of nuclear and radioactive facilities under pandemic conditions was approved. Finally, in the area of bilateral relations, a Memorandum of Understanding was signed with the Canadian regulatory body.

From the standpoint of **communication and information**, and despite the healthcare situation, news was published every two days and activity increased on the social media on which the Council is present. More than 1,700 mailbox queries were responded to (9.86% more than the previous year). An internal bulletin was launched in order to facilitate internal communications with employees working from home. In addition, the CSN continued to keep open the information and communications channels with their stakeholders, holding the two habitual meetings with the Advisory Committee for public information and participation in remote mode.

Despite all the above, 2020 was also a year of celebrations. The regulatory body reached 40 years of public service and we celebrated by publishing a book commemorating this 40th anniversary and dedicated to Maria Goeppert Mayer, Nobel Physics Prize winner in 1963. With a view to adapting to the new normality arising from the COVID-19 pandemic, a virtual CSN stand was designed in order to allow for the remote presence of the Council at events of interest.

I would not like to extend this presentation any further, as it aspires simply to be an invitation for the reader to peruse at leisure the contents of these pages, in which we report to the Parliament. The year 2020 has shown that societies and institutions face many different threats. The capacity to adapt, a speedy response, the ability to generate know-how and teamwork are necessary characteristics for a regulatory body such as the CSN, whose mission continues to be that of overseeing the nuclear safety and radiological protection of the workers, the general public and the environment in an increasingly complex, fast-moving and interdependent world.

MAJOR ACTIVITIES IN 2020

Figure AC.1, shown below, identifies the most significant events that occurred in 2020. These events represent the milestones that the CSN considers to be priorities or of strategic importance. The events are ordered in keeping with the process map that makes up the management system of the organisation, i.e., strategic processes, operational processes and support processes.

In addition, two of the most outstanding events are described monographically. The first corresponds to the renewal of the operating permits of the Almaraz I and II and Vandellós II nuclear power plants.

The second of these monographic descriptions refers to the operation of the CSN during the crisis caused by the COVID-19 pandemic.

Figure AC.1. Major events during 2020

Strategic processes

CSN STRATEGY

- Approval of CSN strategic plan for the period 2020-2025.
- Initiation of CSN Safety Culture assessment project.
- Initiation of digital transformation project within the framework of the CSN electronic administration. INFORENOVE Plan.
- Initiation of SAT methodology application project for the analysis and design of personnel training programmes.
- ACTIONS IN RESPONSE TO COVID-19 PANDEMIC:
  - Development of a CSN activity Continuity Plan in the context of the pandemic. Increased digital capacities
  - Approval of document containing minimum general. criteria for the performance of remote inspections as part of the CSN's inspection function.

STANDARDS DEVELOPMENT

- Progress in the transposition of Directive 2013/59/EURATOM:
  - Approval of RD. 451/2020, of March 10th, on the control and recovery of stray radioactive sources.
  - Approval of RD. 586/2020, of June 23rd, on mandatory information in the event of nuclear or radiological emergency.
  - Continuation of revision of RINR and RPSRI.
- Issuing of CSN Instruction IS-44 on emergency response planning, preparedness and response requirements at nuclear facilities (BOE nº 63 of March 12th 2020).
- Availability of a digital system institutional website for public consultation prior to standards project initiation.

EXTERNAL AND INTERNAL INFORMATION AND COMMUNICATION

- Change in the structure and content of the annual report to Parliament.
- Updating of website and improved accessibility.
- Initiation of YouTube channel operation.

Operating processes

AUTHORISATION

- Extension of preliminary permit for Retortillo: favourable report in July 2020.
- Initiation of assessment of the request issued by Enresa in June 2020 for authorisation of phase I dismantling and transfer of ownership of Santa Mª de Garoña NPP.
- Notification of start-up of proton therapy at the Navarre University Clinic in Madrid.
- Renewal of operating permit for Almaraz I and II NPP.
- Renewal of operating permit for Vandellós II NPP.
- Favourable report on the incorporation of the NFPA-805 standard as the fire-fighting licensing basis for Almaraz NPP.
- Reports and progress on the assessment of spent fuel storage systems (ITS, casks).

SUPERVISION

- Supervision at sites with natural radiation: 5 reactive inspections at La Unión (Murcia) and request for detailed radiological information from the regional Environmental authority.
- Establishment of requirements applicable to the dismantling of installations and restoration of the Flix reservoir following the progress in conclusion of NORM waste decontamination works.

RADIOLOGICAL SURVEILLANCE AND CONTROL OF THE GENERAL PUBLIC AND THE ENVIRONMENT

- Progress of the ASN extension and modernisation project. The objective of having 115 stations in different phases of operation was achieved in 2020.

EMERGENCY MANAGEMENT

- Strengthened collaboration with the National Security Department in relation to emergencies and public security in the nuclear field (2020 exercise postponed due to COVID-19).

Support processes

MANAGEMENT SYSTEM

- Progress in compliance and implementation of the IRRS-ARTEMIS 2018 mission action plan. Execution at 16% with 37 actions open (of the 44 resulting from the mission), of which only 18 are the full responsibility of the CSN.

INTERNATIONAL RELATIONS

- Issuing of the 8th national report in compliance with Directive 2014/87 Euratom, coordinated by the CSN and submitted to the European Commission on 22-7-20.

RESEARCH AND DEVELOPMENT

- Signing of multilateral instrument for cooperation in R&D&i in the field of nuclear energy between the CSN and Ciemat, Enusa, Enresa and ENSA (February 2020).

MAJOR ACTIVITY 1
RENEWAL OF THE OPERATING PERMITS (ROP) OF THE ALMARAZ I AND II AND VANDELLÓS II NUCLEAR POWER PLANTS

One of the most significant events occurring in 2020 has been the renewal of the operating permits of the Almaraz I and II and Vandellós II nuclear power plants. The general characteristics and the milestones of these processes, illustrated in figure AC.2 and identified in table AC.1, are described below.

Figure AC.2. Renewals of operating permits

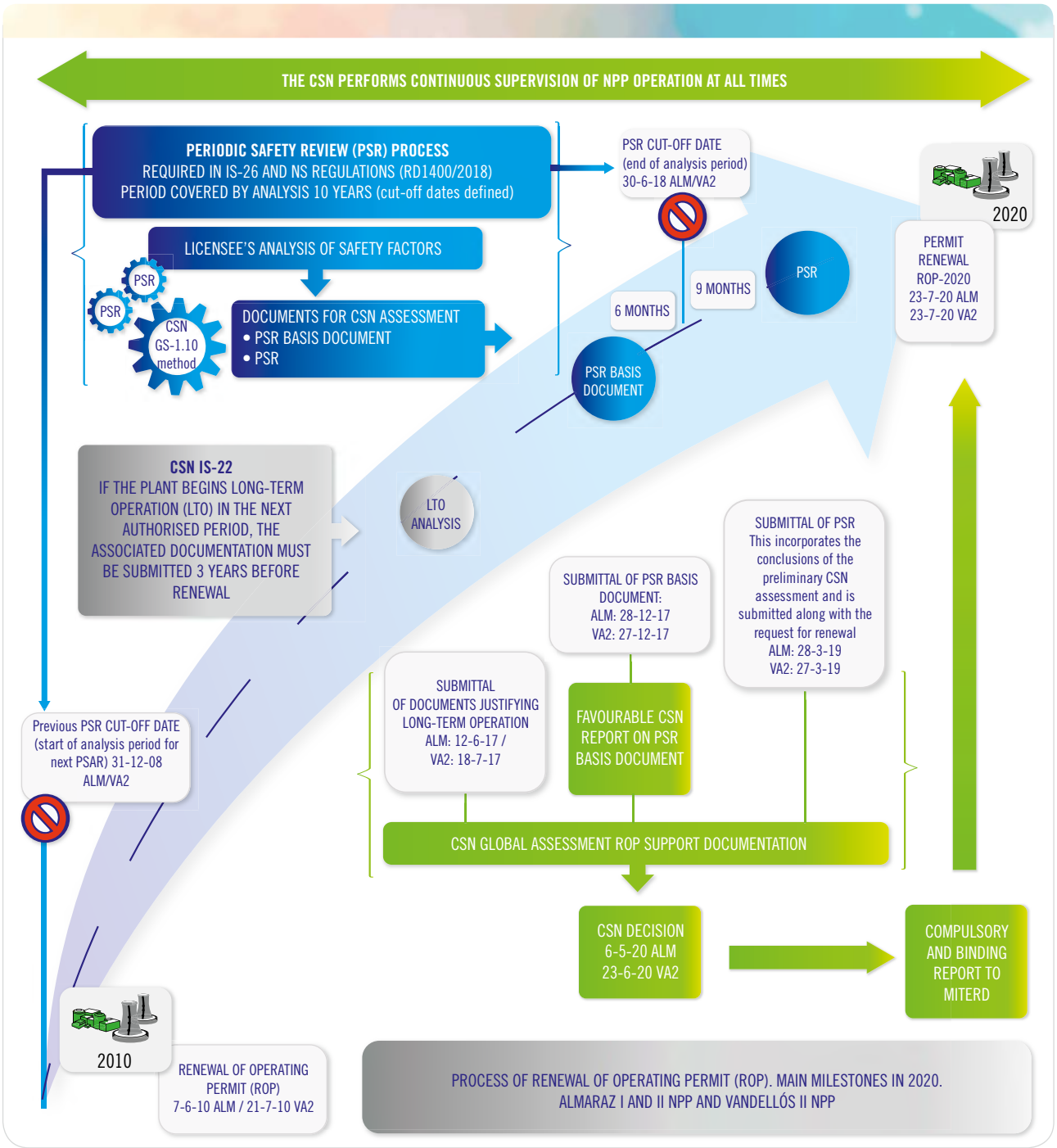


Table AC.1. Operating permit renewal process milestones

OPERATING PERMIT RENEWAL (ROP) PROCESS MILESTONES		
MILESTONE	**ALMARAZ NPP (GROUPS I/II)**	**VANDELLÓS II NPP**
Modification of previous OP OM	ALM NPP/OM/17-01 (7-6-17)	VA2 NPP/OM/17-02 (7-6-17)
OP expiry date	7-6-20	21-7-20
PSR submittal date	31-3-19	31-3-2019
Submittal of request and associated documentation	March 2019	April 2019
CNS requests for additional information (RAI)	June 2019	July-August 2019
Licensee responses to RAIs	August 2019	September 2019
Closure of preliminary assessment	October 2019	November 2019
Meeting with licensee on preliminary conclusions of the assessment	November 2019	December 2019
Meeting with specialist areas and licensee on questions outstanding from preliminary assessment	November 27th 2019	January 2020
Documentation of assessment by specialist areas	December 2019	February-April 2020
Drawing up of technical decision proposal (TDP)	March 2020	May 2020
Review of assessment documentation by CSN Board	5 sessions: April 15th, 22nd and 29th and May 4th and 6th 2020	7 sessions: June 3rd, 5th, 8th, 10th, 17th, 19th and 23rd 2020
CSN Board decision	May 6th 2020	June 23rd 2020
Permit issued by MITERD	ALM NPP/OM/20-02 July 23rd 2020	VA2 NPP/OM/20-01 July 23rd 2020
OP expiry date	Nov 1-27/31-10-28	July 23rd 2030
LTO start date	May 2021/October 2023	December 2027

Almaraz NPP Operating Permit milestones

On July 23rd 2020, the Ministry for Ecological Transition and the Demographic Challenge (MITERD) awarded a renewed operating permit for groups I and II of Almaraz NPP, to remain in force until November 1st 2027 and October 31st 2028, respectively, by means of Ministerial Order CN-AL0/OM/20-02.

Previously, during its meeting of May 6th 2020, the Board of the CSN had agreed to report favourably on the request, with the limits and conditions established in the corresponding report to the MITERD and included in the Appendix of the renewal MO. These consist of 13 conditions, the first 6 being generic and applicable to all nuclear power plant authorisations and the rest specific to Almaraz. Certain of these conditions are dealt with in the seven complementary technical instructions (CTIs) sent to the licensee on July 31st 2020.

Vandellós II NPP Operating Permit milestones

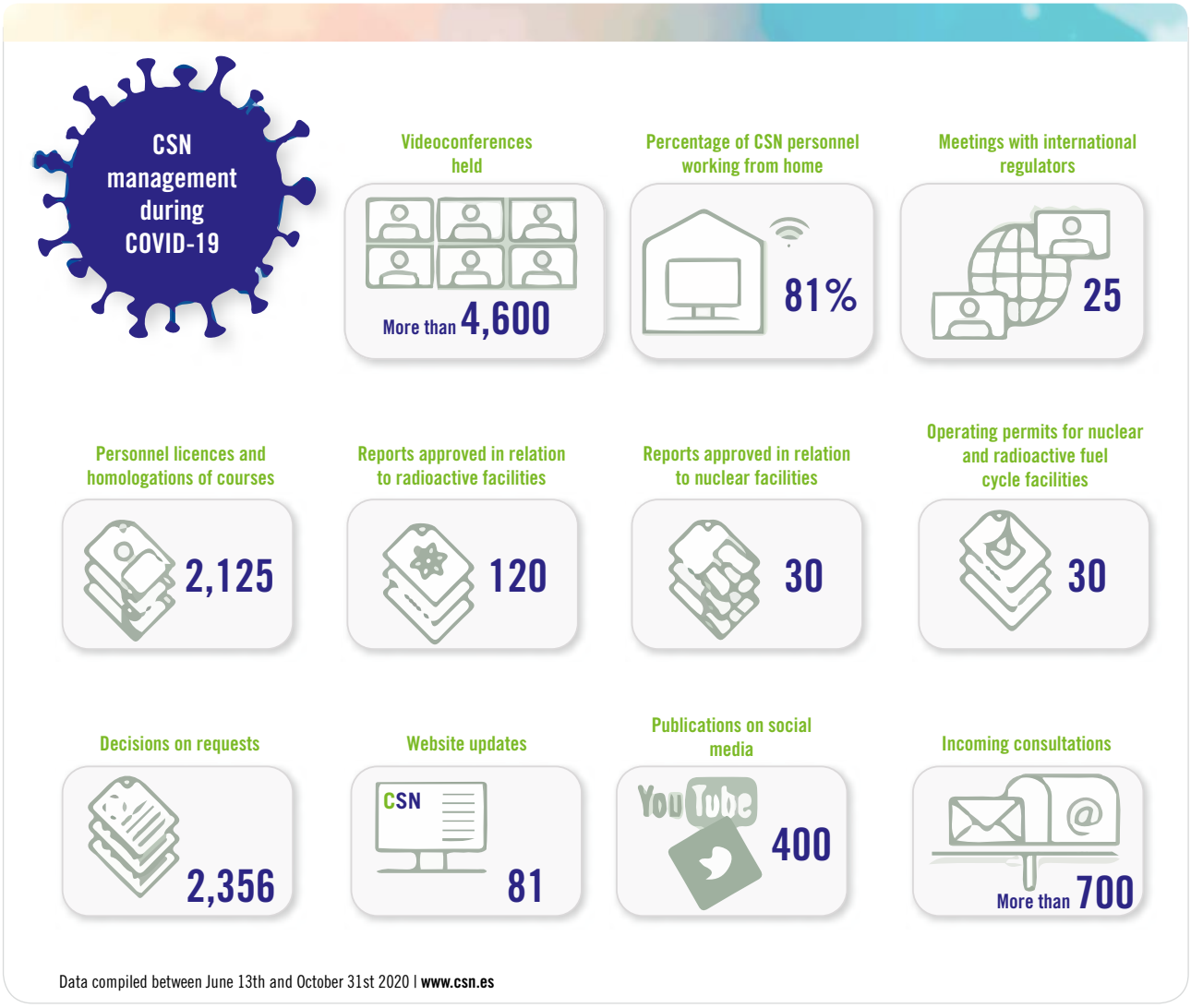
On July 23rd 2020 the MITERD renewed the operating permit for Vandellós II NPP for a period of ten years by means of Ministerial Order CN-VA2/OM/20-01.

Previously, during its meeting of June 23rd 2020, the Board of the CSN had agreed to report favourably on the request, with the limits and conditions established in the corresponding report to the MITERD and included in the Appendix of the renewal MO. These consist of 9 conditions, the first 6 being generic and applicable to all nuclear power plant authorisations and the rest specific to Vandellós II. Certain of these conditions are dealt with in the five complementary technical instructions (CTIs) sent to the licensee on July 28th 2020.

MAJOR ACTIVITY 2
INFORMATION ON THE PLAN TO ENSURE THE CONTINUITY OF CSN ACTIVITY DURING THE COVID-19 CRISIS

From the very beginning of the COVID-19 healthcare emergency the CSN adapted its activities in order to be able to continue performing its functions, bringing the framework established by Royal Decree *463/2020*, of March 14th, *declaring a state of alert for the management of the healthcare crisis caused by COVID-19*, into line with the need to guarantee nuclear safety and radiological protection in the operation of the facilities within its realm of competence.

Figure AC.3. Summary of CSN activities in 2020



The data included in the diagram show that despite the exceptional conditions caused by the coronavirus pandemic, the CSN has continued to operate in the exercising of its functions and areas of competence.

These figures are the result of the efforts made by the organisation overall.

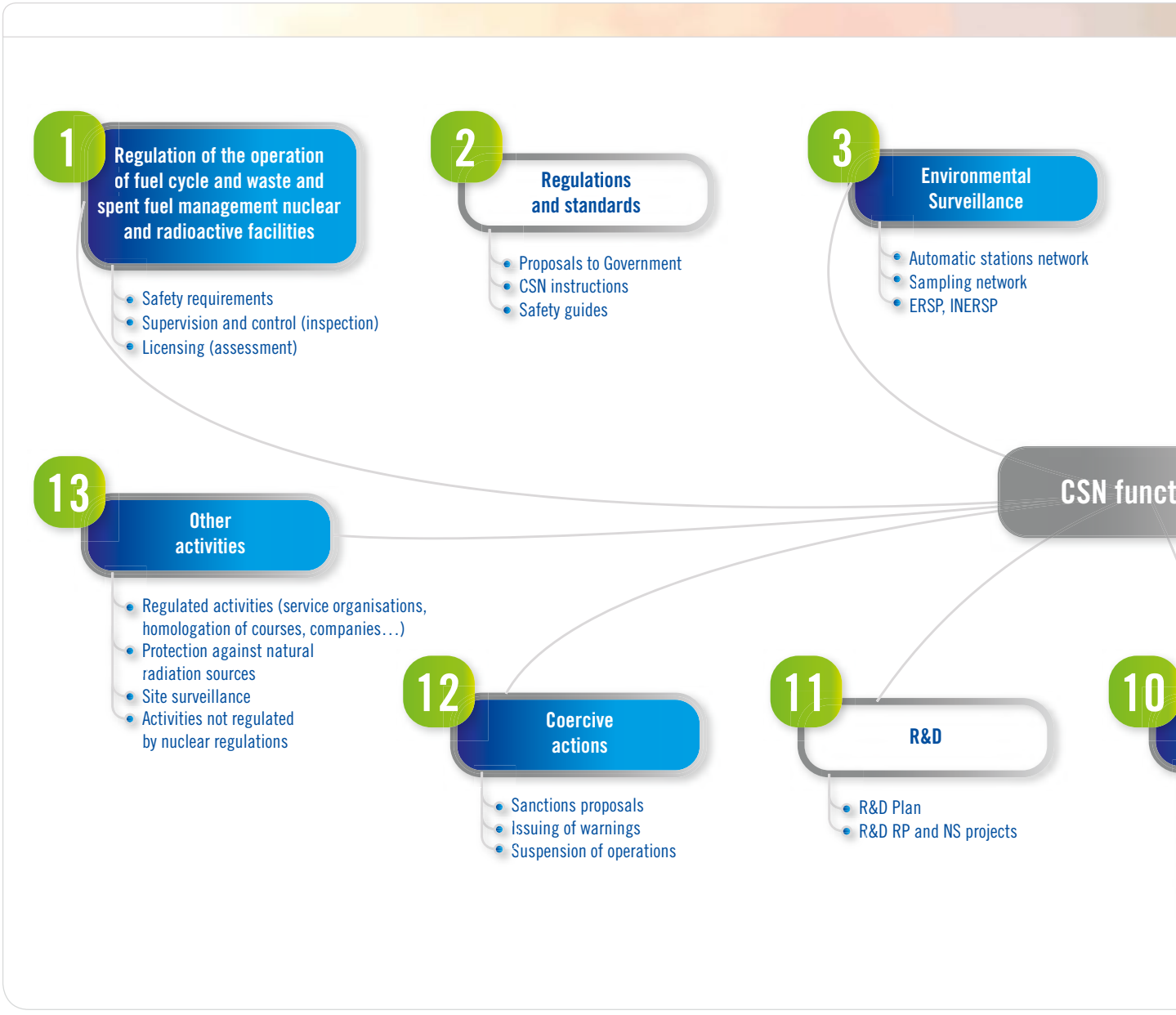
During the months of April to June 2020, the need to draw up a **PLAN TO ENSURE THE CONTINUITY OF THE CSN's ACTIVITIES** was established, with weekly updates aimed at maintaining internal communications among the organisation's personnel, preventing situations of isolation or disconnection.

1. THE NUCLEAR SAFETY COUNCIL. LEGAL FRAMEWORK AND FUNCTIONS

The Nuclear Safety Council (CSN) is an entity existing under public law, independent from the General State Administration (AGE) and with its own legal standing and assets independent from those of the State. The Council was created by Law 15/1980, of April 22nd, as the body solely responsible for nuclear safety and radiological protection. In keeping with what was foreseen in that Law, the Charter of the CSN was approved by the Government by way of Royal Decree 1440/2010, of November 5th.

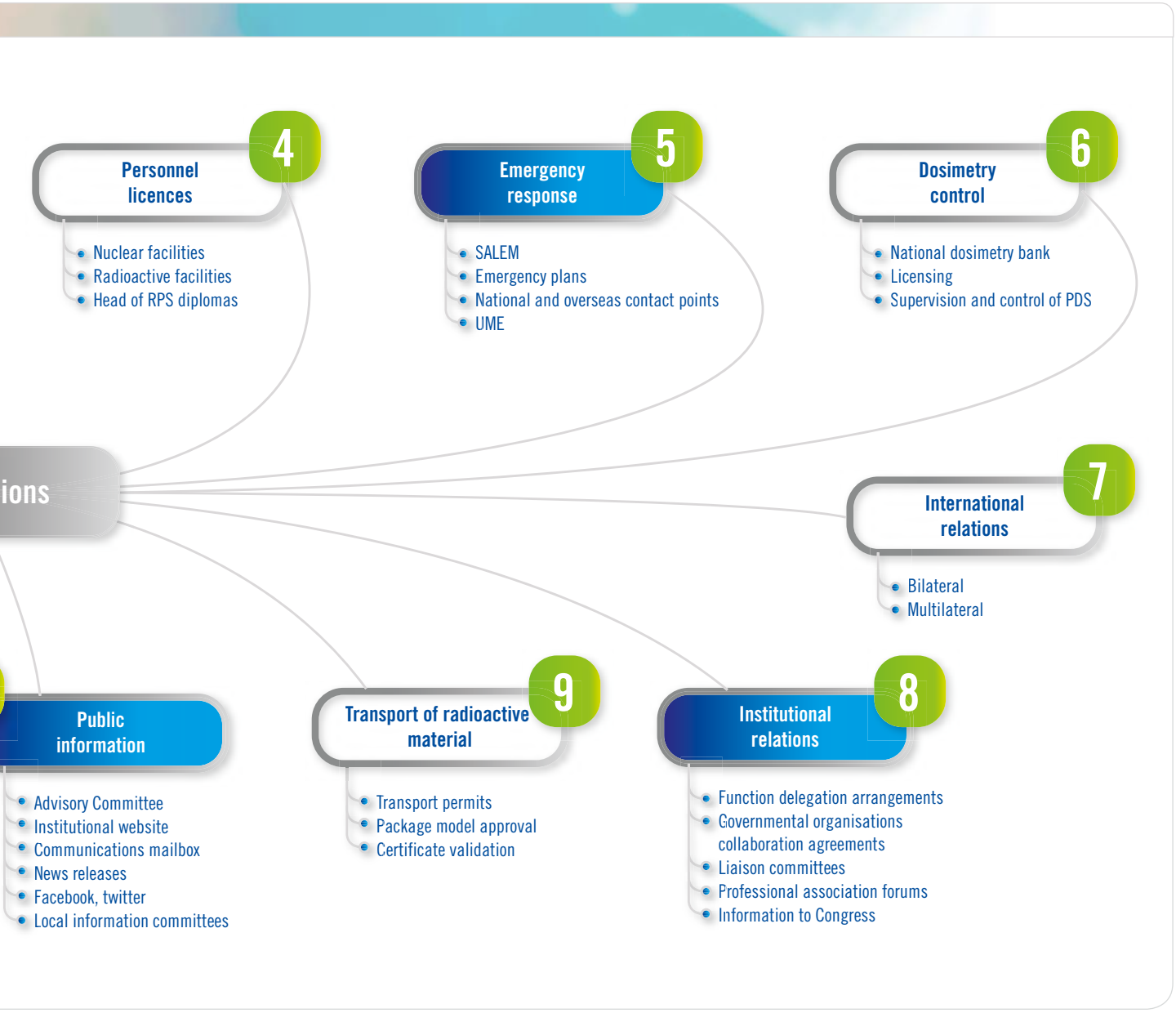
The CSN is responsible for the performance of all the functions established in article 2 of Law 15/1980 and in Title I of the Charter, as well as of whatever others relating to nuclear

Figure 1.1. Summary of CSN functions



safety, radiological protection and physical protection might be attributed to it by law or regulation or pursuant to international treaties.

In addition, article 11 of Law 15/1980 establishes that every year the CSN shall submit a report on the performance of its activities to the two houses of the Spanish Parliament and to the regional parliaments of Autonomous Communities housing nuclear facilities in their territories. The present report is issued in compliance with this rule.



1.1. The Board of the Council

The Board is made up of the following persons:

Figure 1.1.1. Members of the Board

Josep Maria Serena i Sender
(President)
29 march 2019

Javier Dies Llovera
(Counsellor)
16 october 2015

Francisco Miguel Castejón Magaña
(Counsellor)
29 march 2019

Elvira Romera Gutiérrez
(Counsellor)
29 march 2019

María del Pilar Lucio Carrasco
(Counsellor)
29 march 2019

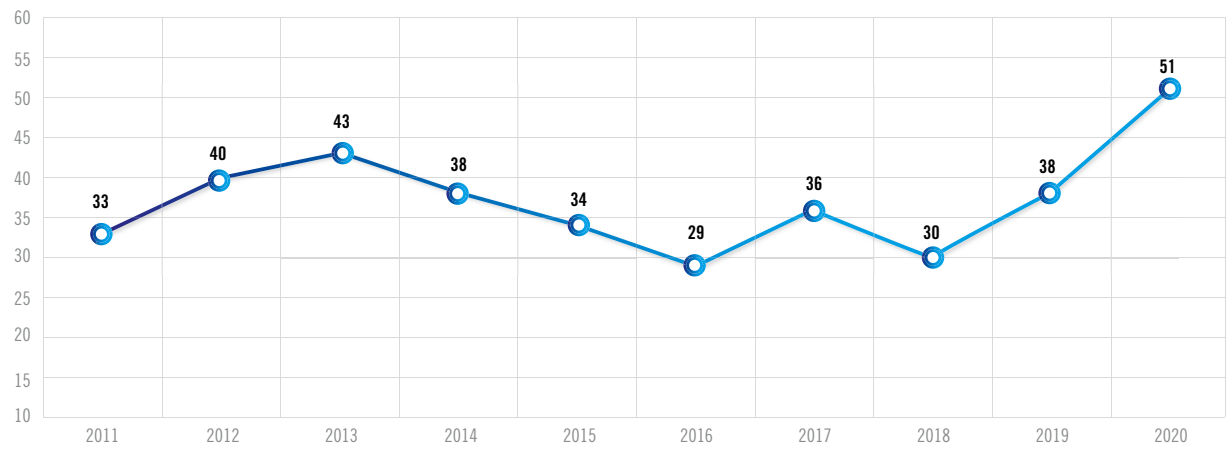
During 2020 the Board held 51 sessions, with 467 agreements being reached.

As from March 25th, and as a result of Royal Decree 463/2020, of March 14th, declaring a status of alert for the management of the healthcare crisis brought about by COVID-19, the normal operations of the Board sessions were carried out using videoconferencing systems.

The minutes of the Board sessions and the findings on which their agreements are based are available for general consultation on the CSN's institutional website (www.csn.es).

Diagram 1.1.1 shows the evolution of the number of sessions held by the Board since 2011. It may be appreciated that in 2020 the number of sessions increased, with a significant number of them being dedicated by the Board to analysis and study prior to decision-making in relation to renewal of the operating permits for the Almaraz and Vandellós II nuclear power plants.

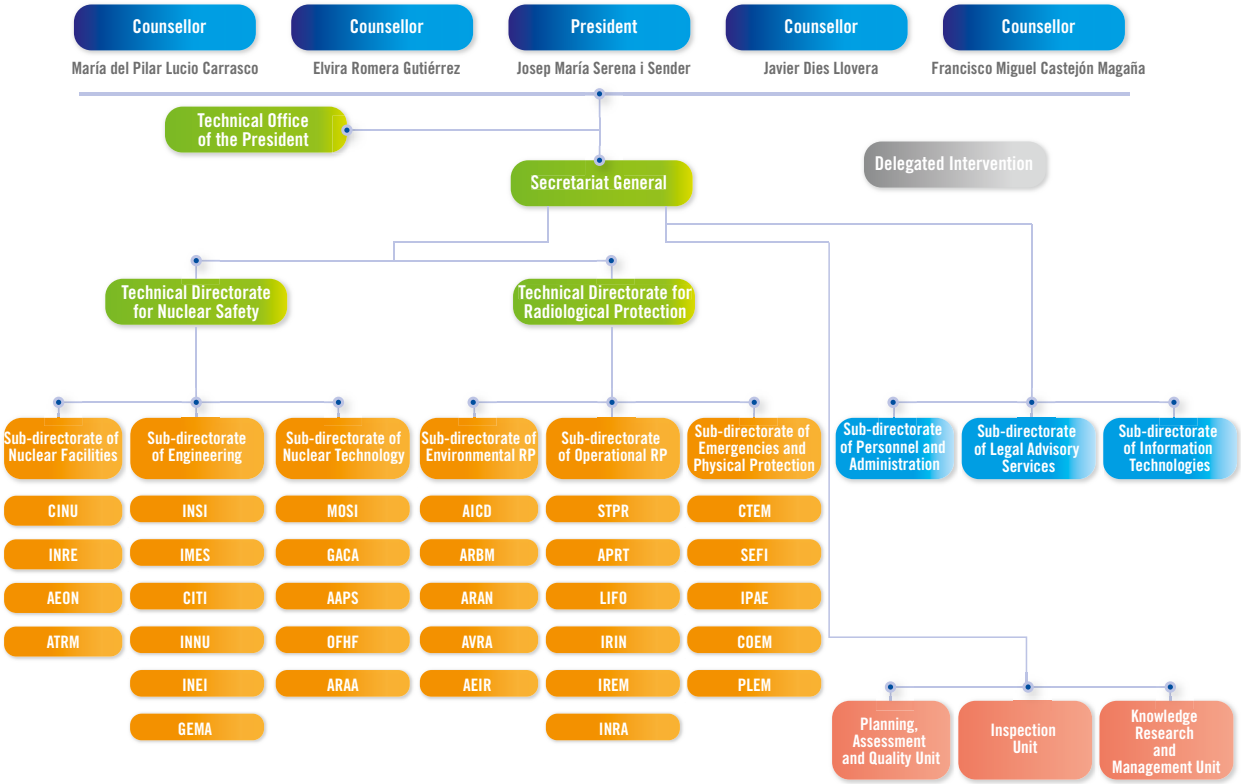
Diagram 1.1.1. Evolution of the number of meetings held by the Board since 2011



1.2. Organisational structure of the CSN

The following figure shows the organisational structure of the CSN as it stood on December 31st 2020.

Figure 1.2.1. CSN organisational flowchart



Sub-directorate of Nuclear Facilities
CINU: Nuclear Facilities Coordinator
INRE: Coordination and Support for Resident Inspectorate
AEON: Operating Experience and Standards Area
ATMR: Radioactive Material Transport Area

Sub-directorate of Engineering
NSI: Systems Engineering Area
IMES: Mechanical and Structural Engineering Area
CITI: Earth Sciences Area
INNU: Core Engineering Area
INEI: Electrical Systems, Instrumentation and Control Area (Sub-directorate of Engineering)
GEMA: Lifetime Management and Maintenance Area

Sub-directorate of Nuclear Technology
MOSI: Modelling and Simulation Area
GACA: Quality Assurance Area
AAPS: Probabilistic Safety Analysis Area
OFHF: Organisation, Human Factors and Training Area
ARAA: High Level Waste Area

Sub-directorate of Environmental RP
AICD: Fuel Cycle Facilities and Decommissioning Area
ARBM: Low and Intermediate Level Waste Area
ARAN: Natural Radiation Area
AVRA: Environmental Radiological Surveillance Area
AEIR: Radiological Impact Assessment Area

Sub-directorate of Operational RP
STPR: Radiological Protection Technical Services Area
APRT: Occupational Radiological Protection Area
LIFO: Licensing and Training Area
IRIN: Industrial Radioactive Facilities Area
IREM: Radioactive Facilities and Medical Exposure Area
INRA: Radioactive Facilities Inspection Area

Sub-directorate of Emergencies and Physical Protection
CTEM: Emergencies Technical Coordinator (Sub-directorate of Emergencies)
SEFI: Security Area
IPAE: Emergency Intervention and Responder Preparedness Area
COEM: Emergency Operations Coordination Area
PLEM: Emergency Planning Area

1.3. Resources and means

1.3.1. Human resources

Human means

As of December 31st 2020, the total number of persons working at the Council amounted to 424, as summarised in figure 1.3.1.1.

Diagram 1.3.1.1 shows the distribution of the workforce by job posts in 2020 and compares its composition over the period 2013- 2020.

Figure 1.3.1.1. CSN workforce as of December 31st 2020

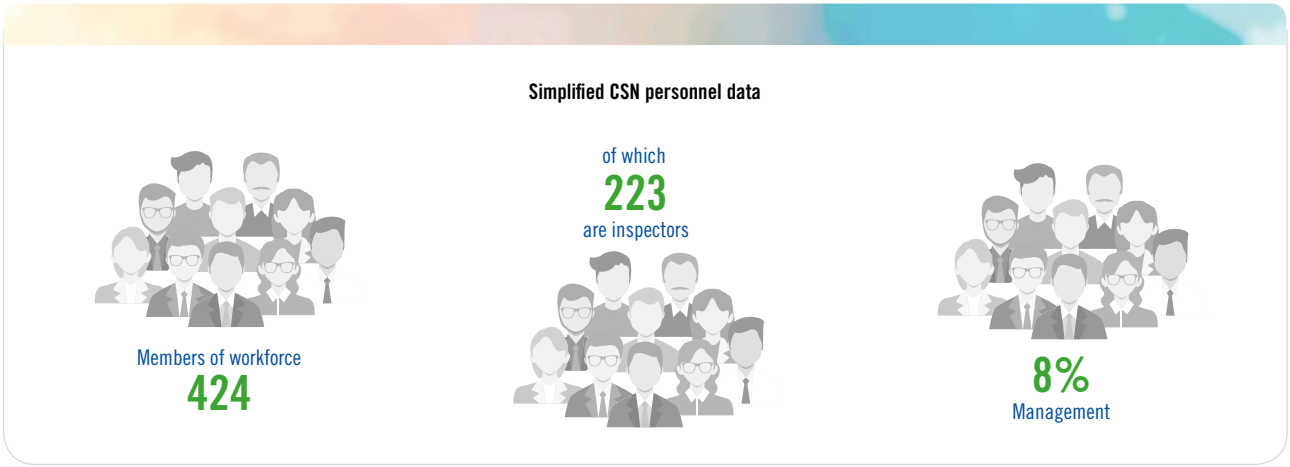
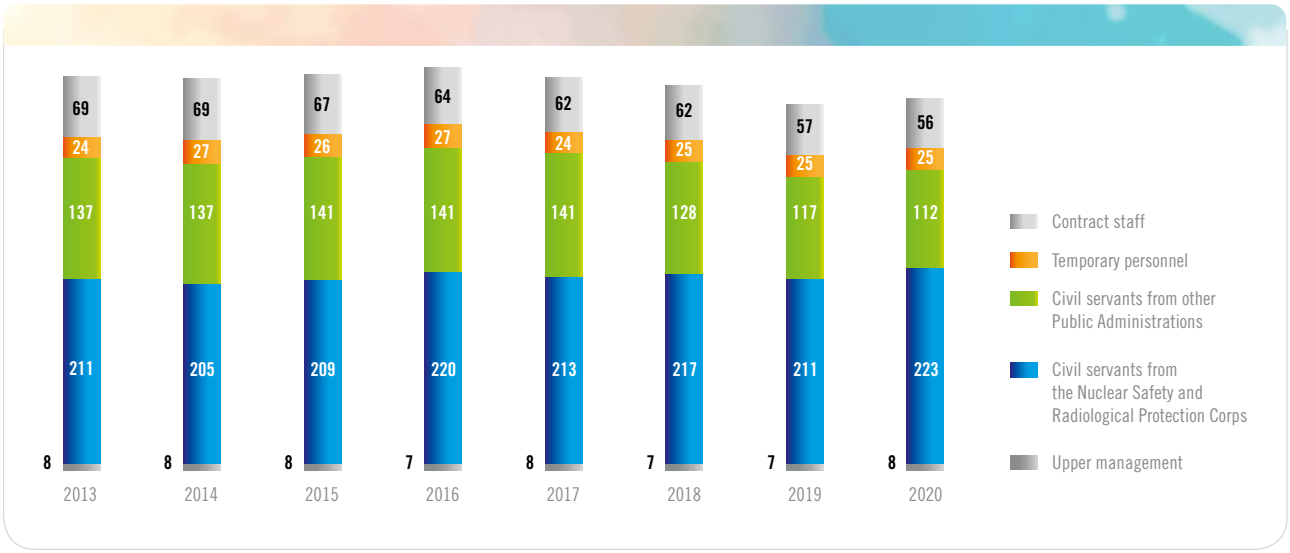
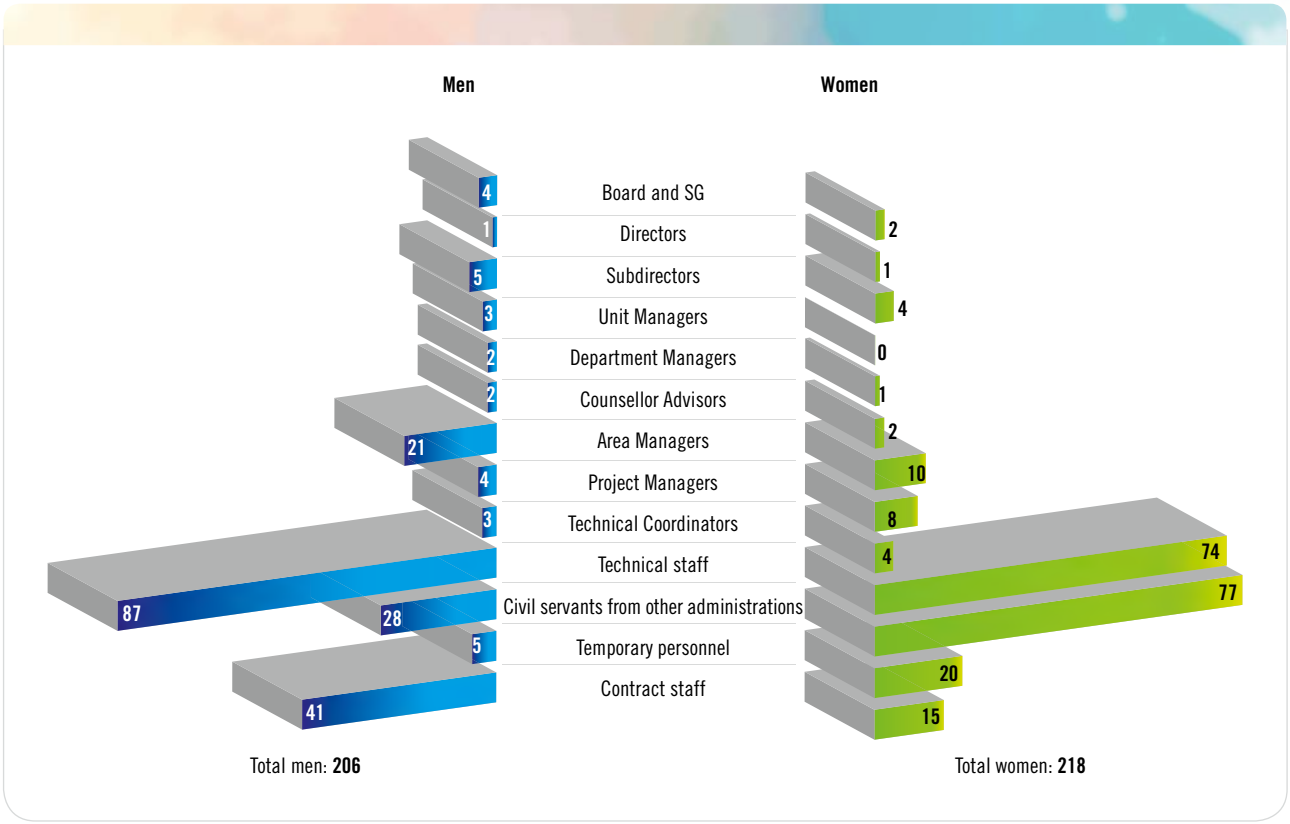


Diagram 1.3.1.1. Distribution of the workforce by job post over the period 2013-2020



The average age of the workforce is 53 years. It is interesting to note that the number of women working at the CSN represents 51.42 % of the total workforce, and the men 48.58 %, the distribution by job post being indicated in figure 1.3.1.2

Figure 1.3.1.2. Distribution of the CSN workforce by job post and sex



1.3.2. Economic resources

The financial year gave a positive result amounting to 4,360 thousand euros, as summarised below in table 1.3.2.1:

Table 1.3.2.1. Summary of balance for the financial year 2020

SUMMARY OF BALANCE FOR THE FINANCIAL YEAR 2020 INITIAL BUDGET 46,937 THOUSAND EUROS (*)			
EXPENSES		**INCOME**	
ITEM	**PERCENTAGE**	**ITEM**	**PERCENTAGE**
PERSONNEL salaries, social security, welfare expenses	63.5 %	Fees for services rendered	99.5%
External supplies and services. Company activities, consumables and communications	27.5 %	Current transfers and subsidies, financial income and other management income	0.5%
Others (amortisations, subsidies, scholarships, transfers, etc.)	8 %		
POSITIVE RESULT 4,360 thousand euros			

(*) This consists of a definitive budget of 101,287 thousand euros due to the credit extension of 54,350 k€ performed in anticipation of the provision of funds within the context of COVID-19.

1.3.3. Data-processing media

Table 1.3.3.1. lists the most relevant activities carried out in this area in 2020.

Table 1.3.3.1. Relevant activities in information technologies

Adaptation to remote working (VPNs, diverse secure communications platforms, pre-setup laptop computers, training in cybersecurity…).
Design and start-up of the Digital Transformation Plan, incorporating the InfoRenove Plan for the updating of a significant number of CSN computer applications.
Design and start-up of the Action Plan of the Sub-Directorate of Information Technologies (STI) for the period 2020 to 2025.
Renewal of personnel allocation applications (ALLOCATIONS) related to operational research and the analysis of resources.
Incorporation of new modules in the INUC application for the management of information relating to nuclear and fuel cycle facility activities.
Start-up of the Electronic Headquarters 2.0 for communications with the CSN.
Modification of 24 corporate applications as part of the on-going process of adapting Information and Communication Technologies (ICT) to the provisions of Law 39/2015, of October 1st, on the Common Administrative Procedure of the Public Administrations.
Implementation of a more solid AntiSpam system and a new access control server centralising the authentication, authorisation and accounting of users accessing certain corporate resources (wifi, VPN, etc.).
Completion of the secure network infrastructure for confidential information for the Sub-Directorate of Emergencies and Physical Protection (SEP).
Integration of the CLAUDIA and micro Claudia tools for the detection of complex threats in the user station (cybersecurity).

1.4. Council Commissions

Figure 1.4.1. shows the commissions that were active during 2020 and the activities performed.

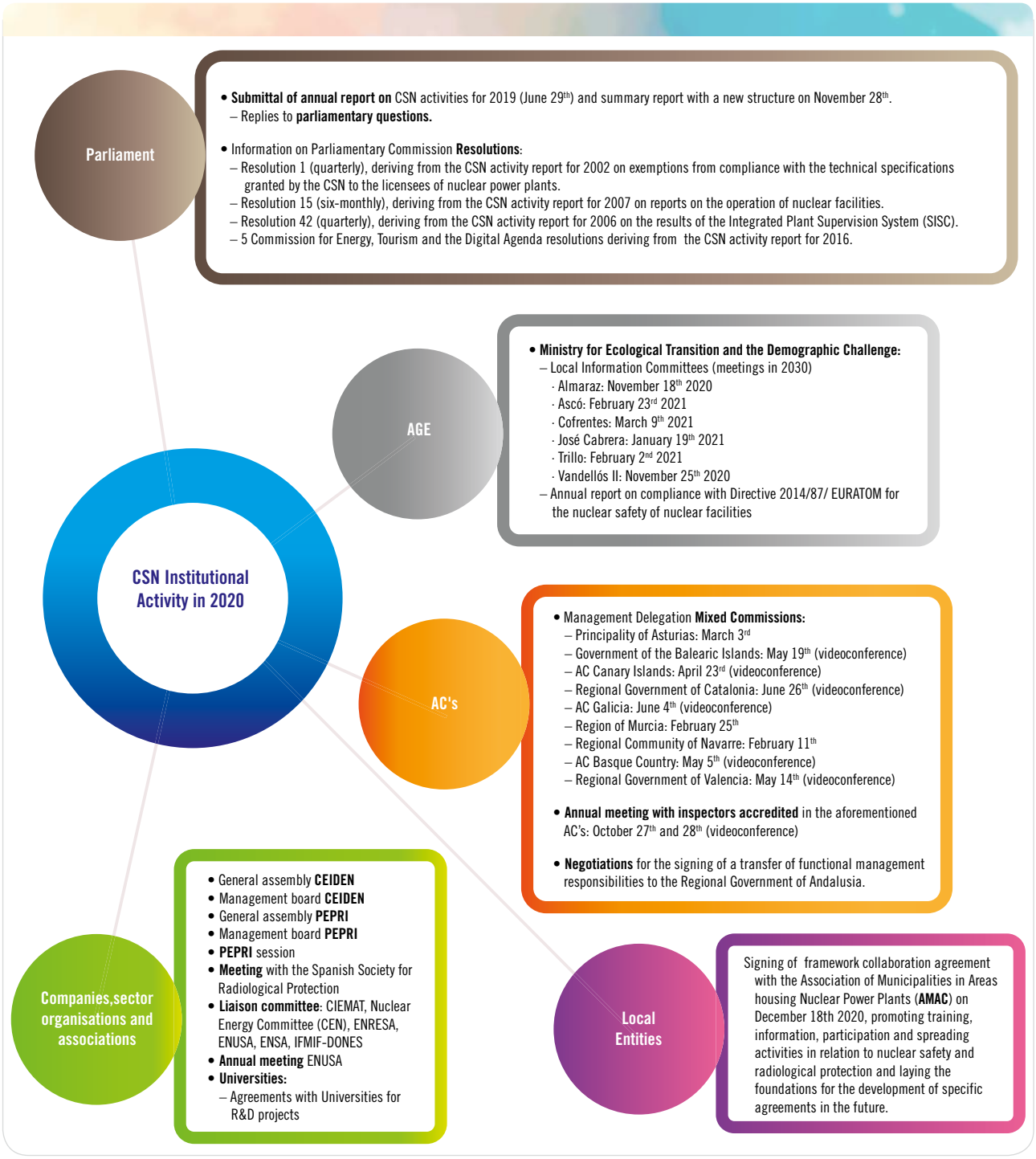
Figure 1.4.1. Commissions active during 2020

1.5. CSN relations and institutional activity

1.5.1. Institutional relations

One of the functions of the Nuclear Safety Council is to maintain official relations with the institutions of the State at central, regional and local level, as well as with professional organisations and non-governmental associations. Especially noteworthy for its relevance and unique nature is the CSN's institutional relationship with the Congress and the Senate. Figure 1.5.1.1 summarises the CSN's institutional activities in this area during 2020.

Figura 1.5.1.1. Relaciones institucionales. Actividades en el 2020



The Ministry for Ecological Transition requested the CSN to provide information in response to the three initiatives identified in summary in Table 1.5.1.1. The Government's replies are published in the Parliament's Official Bulletin.

In addition, the parliamentary group VOX submitted a request for information on September 11th 2020, requesting copies of the minutes of the CSN Board meetings held in 2018, 2019 and 2020.

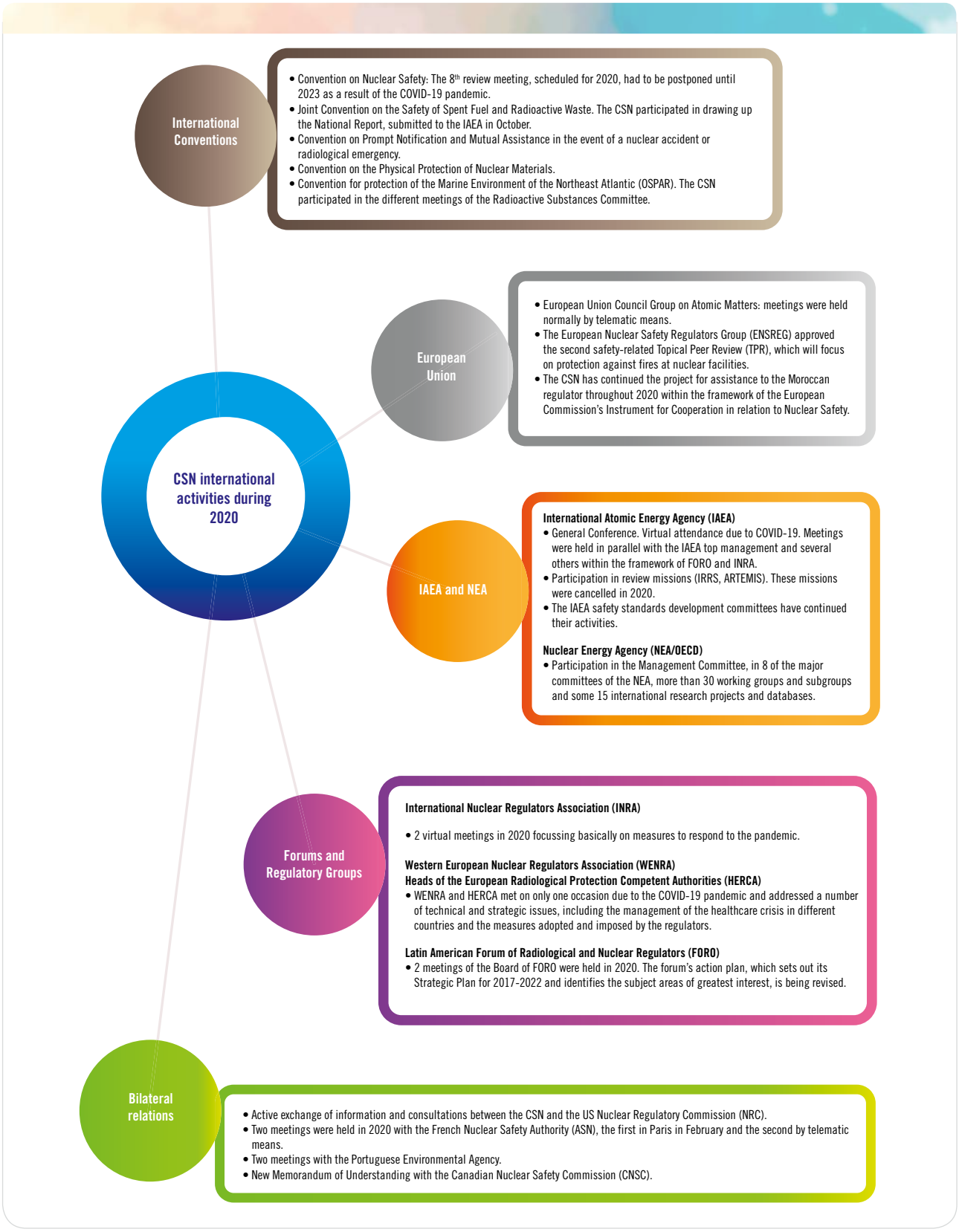
Table 1.5.1.1. Parliamentary questions put to the CSN by the Government for information

AUTHOR	PARLIAMENTARY GROUP	SUBJECT
Joan Baldoví	Compromís (Congress)	Question on the Individual Temporary Storage (ITS) facility at Cofrentes nuclear power plant (Valencia).
Mireia Borrás Pabón Pedro Requejo Novoa Luís Gestoso de Miguel Ángel López Maraver	Vox (Congress)	Question on Nuclear Safety Council cash surplus.
Mireia Borrás Pabón Pedro Requejo Novoa Luís Gestoso de Miguel Ángel López Maraver	Vox (Congress)	Question on protection of the workers, the general public and the environment.

1.5.2. International relations

Figure 1.5.2.1 shows the activities carried out by the CSN during 2020 at international level.

Figure 1.5.2.1. CSN international activities during 2020

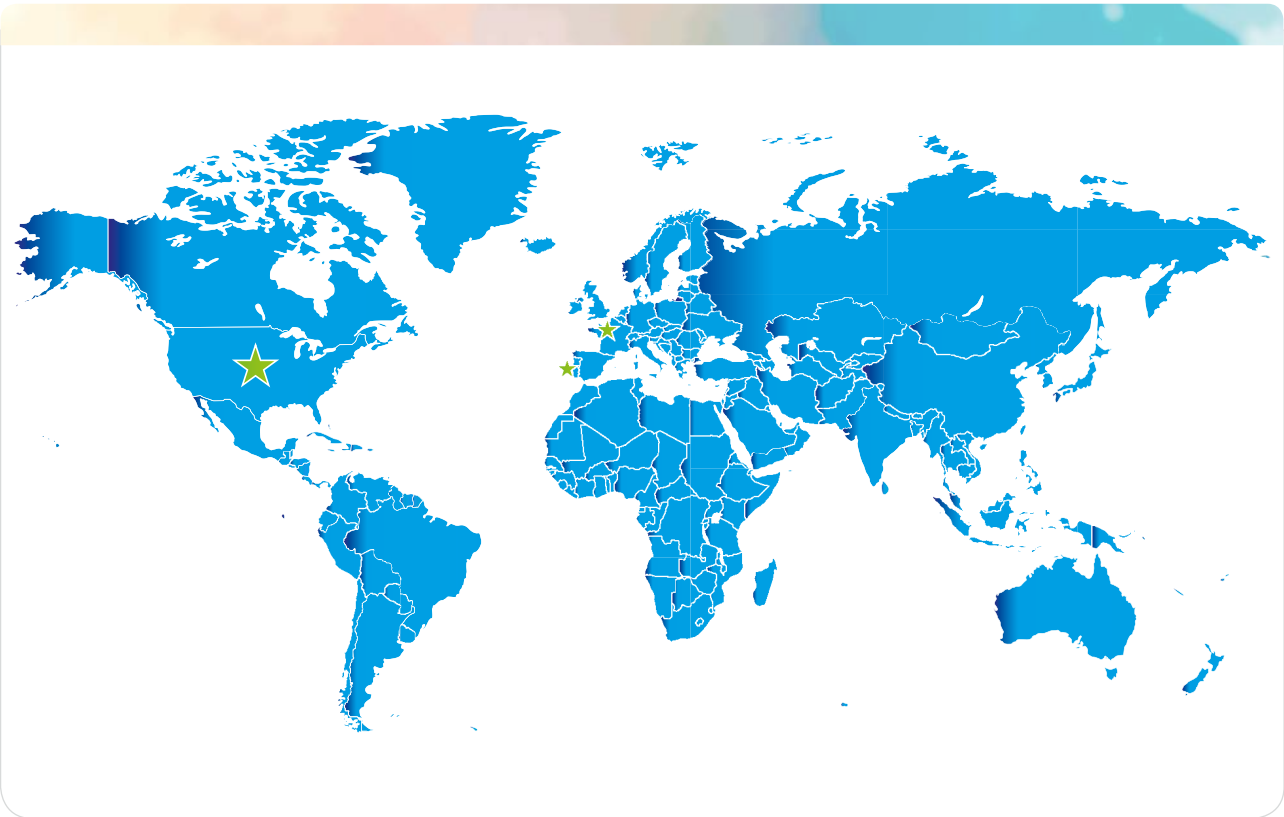


Despite the global health crisis, the close cooperation that exists with the US and French regulatory bodies continued throughout 2020 by way of numerous joint institutional and technical activities, carried out using remote working means. Furthermore, a Memorandum of Understanding (MoU) was signed with the Canadian nuclear regulator in 2020, and another, foreseen for signing in 2021, was promoted with Portugal.

Figure 1.5.2.2 sets out the bilateral agreements reached by the CSN with its counterpart bodies in 2020.

Bilateral relations with counterpart organisations: *Despite the healthcare situation, which implied the cancellation of a large part of international activity, in 2020 the CSN promoted and continued work with the USA, France and Portugal, holding bilateral meetings in telematic format.*

Figure 1.5.2.2. Map of bilateral agreements with counterpart bodies in 2020



1.5.3. Public information and communication

In 2020, as a result of the healthcare crisis caused by COVID-19, the CSN made efforts to improve and reinforce communications, both in-house and externally, especially during the period between the start of the state of alert and June 21st. Figure 1.5.3.1 identifies the most significant actions in this respect.

All the publications are available to the public for downloading free of charge from the documentation centre on the CSN's institutional website:

https://www.csn.es/documents/10182/1931674/Cat%C3%A1logo+de+publicaciones/d494e458-5d33-d829-c98f-5e0e14ccbe10

Figure 1.5.3.1. Significant communication activities in 2020

1.6. Advisory Committee for Public Information and Participation

The Advisory Committee for Public Information and Participation in relation to nuclear safety and radiological protection was set up pursuant to article 15 of Law 15/1980, creating the CSN, with the mission of issuing recommendations favouring and enhancing transparency, access to information and the participation of the public in areas included within the realm of competence of the CSN.

Full information on the activities of the Advisory Committee may be found on the CSN's institutional website (www.csn.es). https://www.csn.es/comite-asesor

Two meetings were held in 2020, the nineteenth and the twentieth, on June 18th and November 26th respectively, both by means of the Teams platform.

Table 1.6.1. shows the number of participants and the presentations on specific subjects made during the two aforementioned meetings.

Table 1.6.1. Summary of the two meetings held in 2020

NUMBER	ATTENDEES	PRESENTATIONS ON SPECIFIC SUBJECTS		
		DSN	DPR	GTP
Meeting 19	31	Overall evaluation of the ageing status of safety-related structures, systems and components at nuclear power plants.	CSN activities within the framework of the National Plan for Action against Radon.	
Meeting 20	31	CSN supervision of human and organisational factors at nuclear power plants.	CSN participation in the implementation of the Basic Guideline on radiological risk.	Supervision and control of nuclear safety and radiological protection during the pandemic.

The Advisory Committee has issued 12 recommendations to the Council since its beginnings in 2011. As of December 31st 2020, 5 of these recommendations remain open, one has been partially resolved and the rest have been completed.

2. STRATEGY AND MANAGEMENT OF RESOURCES

2.1. Strategic Plan

The current strategic plan was approved by the Board during its meeting on June 17th 2020 and covers the period 2020-2025. The Plan describes how the CSN intends to achieve its strategic goals relating to nuclear and radiological safety and to the fulfilment of its sustainable development objectives.

The Plan sets out the mission and the vision of the organisation. It establishes two strategic goals, one relating to nuclear and radiological safety and the other to the achievement of sustainable development objectives. The strategic sustainability goal is transversal and will be incorporated in all the processes making up the CSN's management system.

Figure 2.1.1. Logo of the CSN Strategic Plan

The Strategic Plan contemplates five strategic objectives. The CSN will demonstrate their status by means of the following indicators:

Figure 2.1.2. Strategic Objective 1

Objective 1

Maintain effective supervision of the actions of the licensees of facilities or activities, focussing on the most safety-significant aspects.

REGULATION

INSPECTION/CONTROL

Performance indicators

The CSN will demonstrate its performance by way of the following indicators:

Table 2.1.1. Strategic objective 1 status indicators

OBJECTIVE	ACTIVITY	FORECAST AND COMPLIANCE
OE.1.1.	Renewal of nuclear facility permits (NPP's and Juzbado)	Objective: Issuing of a report on the request for renewal of the operating permits for Almaraz and Vandellós II NPP's Action: The Council Board fulfilled this objective 100% in 2020 through the issuing of the reports corresponding to the Almaraz (06/05/2020) and Vandellós II (23/06/2020) nuclear power plants, in response to a request by the Ministry for Ecological Transition and the Demographic Challenge
OE.1.2.	Licensing of the Retortillo uranium concentrates plant	The status indicator for this objective consists of reporting on the request for the construction permit during the period 2020-21. Suitable progress has been made with respect to this objective in 2020 and it is expected to be completed in 2021
OE.1.3.	Follow-up of SSC ageing management programmes	Objective: Follow-up inspection of the integrated ageing assessment and management plan for Cofrentes NPP Action: performed in September. 100% of the objectives for 2020 have been fulfilled
OE.1.5.	Implementation of new ASN stations	Objective: Installation of 71 stations Action: the installation of these stations has been completed. 100% of the objectives for 2020 have been fulfilled
OE.1.8.	Development of standards	Objective: Approval of Council Instruction IS-44 and Safety Guide GS-10.10 (Rev. 1) Action completed. 100% of the objectives for 2020 have been fulfilled

Figure 2.1.3. Strategic Objective 2

Objective 2

Increase efficiency and effectiveness in the performance of the CSN's functions and areas of competence

COMPETENCE

RESEARCH AND DEVELOPMENT

Performance indicators

The CSN will demonstrate its performance by way of the following indicators:

Table 2.1.2. Strategic objective 2 status indicators

OBJECTIVE	ACTIVITY	FORECAST AND COMPLIANCE
OE.2.1.	Implementation of IRRS 2018 mission Action Plan	Objective: Performance of up to 75% of the action plan during the period 2020-21 Action: 16% was performed. Closure of the outstanding actions for which the CSN is responsible is foreseen during 2021
OE.2.2.	Updating of management system	Objective: Performance of up to 50% of the updating plan during the period 2020-21 Action: Implementation of the energy management, environmental, occupational safety and health improvement and information security management systems was analysed. Implementation is foreseen during 2021
OE.2.3.	Implementation of results of CSN safety culture self-assessment	Objective: Performance of up to 25% of the action plan during the period 2020-21 Action: 25% of the action plan of the programme associated with assessment of the CSN safety culture has been carried out. Completed
OE.2.4.	Improvement of process of penalties	Reflection on this process of improvement began in 2020
OE.2.5.	Improvement of the R&D project selection methodology	In 2020 a methodology was set up for calls for subsidies for R&D projects by means of a system of competitive participation
OE.2.6.	Annual R&D budget implementation (chapter 6+7)	Objective: implementation during the period 2020-21 >60% Action: 48.5% was implemented in 2020, and full implementation is expected to be completed in 2021, by means of a system of competitive participation
OE.2.7.	Completion of safety culture action plan	Objective : initiation of the safety culture self-assessment process Action: In 2020 an external company was contracted to undertake assessment of the organisation's safety culture 25% of the safety culture programme action plan was implemented. The goals set out for 2020 were reached

Figure 2.1.4. Strategic Objective 3

Objective 3

Assurance that the CSN maintains and improves its capacity to respond to emergency situations and strengthens its capabilities in relation to security

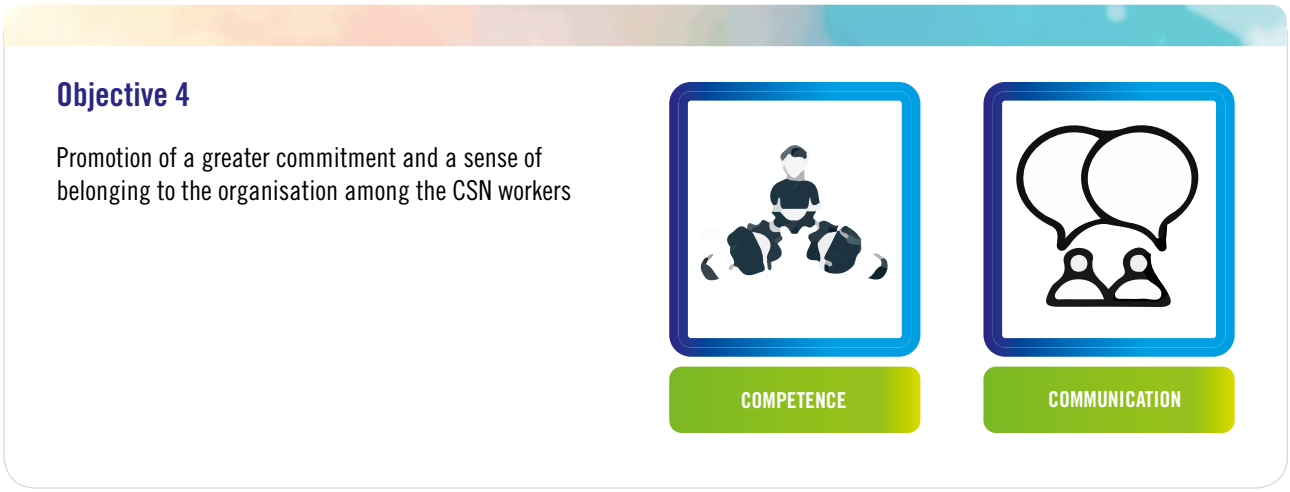
Performance indicators

The CSN will demonstrate its performance by way of the following indicators:

Table 2.1.3. Strategic objective 3 status indicators

OBJECTIVE	ACTIVITY	FORECAST AND COMPLIANCE
OE.3.1.	Organisational and methodological development in relation to the CSN emergency response structure	Action: During its meeting of January 9th 2020, the Board analysed a new model for the permanent manning of the emergency response room (Salem). On February 12th 2020, a subject-specific meeting was held on this issue, during which the DRP informed the Board of the plan to improve the nuclear and radiological emergency response and its state of implementation
OE.3.2.	Strengthening of the security regime	All the objectives prioritised as category 1 and depending on the CSN have been fulfilled Action completed in 2020

Figure 2.1.5. Strategic Objective 4



Performance indicators

The CSN will demonstrate its performance by way of the following indicators:

Table 2.1.4. Strategic objective 4 status indicators

OBJECTIVE	ACTIVITY	FORECAST AND COMPLIANCE
OE.4.1.	Implementation of remote working	Action: Draft 0 of the programme regulating remote working at the CSN was drawn up This draft was subjected to comments by the CSN personnel. 144 comments were received, were analysed individually and were referred to the Board. Revision 1 was drawn up following analysis of the comments received The goals mapped out in this area for 2020 have been fulfilled and completion of the programme is foreseen for 2021
OE.4.2.	Approval by the CSN Board of the new professional career model	Action: Draft 0 of a new CSN personnel professional career model was drawn up in accordance with the provisions of the Basic Charter of Public Employees. This model was drawn up by a task force including the social partners represented in the organisation The results of this task force were subjected to comments by all the social partners. The comments received were analysed by the management of the organisation and the results of this analysis were transmitted to the members of the Board, along with the result of the mixed participant task force The objective mapped out for 2020 was fulfilled
OE.4.3.	Updating of training programme	Activity not yet initiated and predicate on the establishment of the SAT methodology at the CSN. The process of implementation was carried out in 2020 and the objective mapped out was fulfilled
OE.4.4.	Drawing up of CSN Equality Plan	Action: The roadmap associated with the drawing up and implementation of an Equality Plan for the CSN was established. Completion of the Plan is expected in 2021. Progress adequate

Figura 2.1.6. Strategic Objective 5

Objective 5

Improve perceptions of the activity of the regulator among the public and stakeholder groups through rigour, truthfulness and reliability

Performance indicators

The CSN will demonstrate its performance by way of the following indicators:

Table 2.1.5. Strategic objective 5 status indicators

OBJECTIVE	ACTIVITY	FORECAST AND COMPLIANCE
OE.5.1.	Promote/reinforce the establishment of collaboration agreements with national bodies	Action: During its meeting on 11-11-20320, the Board approved the signing of a collaboration agreement between the CSN and the Association of Municipalities in areas housing NPP's and waste storage facilities. Compliance with this objective was adequate throughout 2020
OE.5.2.	Implementation of public consultation and information arrangements in the drawing up of CSN standards	Action: 100% of the standards programme projects subjected to public consultation and information arrangements were published in the area set aside for this purpose on the CSN's institutional website. Objective fulfilled in 2020
OE.5.3.	Compliance with Advisory Committee recommendations	Action: Advisory Committee (AC) outstanding recommendation nº 6 was closed through the distribution during the Committee's meeting held on November 26th 2020 of the document drawn up by the CSN and entitled "Impact of the long-term operation (LTO) of nuclear power plants on nuclear safety and radiological protection", and the members of the AC were invited to submit comments within 15 days The feedback received was analysed and led to modifications of the said document 17% performance in 2020. The objective is considered to have been suitably fulfilled as a large number of the outstanding recommendations are associated with the holding of informative or educational sessions impacted by the healthcare crisis

2.2. Management System

The management system is directed by the Management System and Information Security Committee.

During the five meetings held in 2020, the Committee analysed the reviews of the management and administrative procedures included in the management system manual and submitted to it, the performance status of the action plan emanating from the IRRS-ARTEMIS mission carried out in Spain by the IAEA in October 2018, the internal audit plan and the status of the non-conformities and opportunities for improvement arising from it. It also analysed the modifications to be made to the annual schedule of activities to be performed and their tracking.

Likewise, the Committee analysed proposals for activities singled out for inclusion in the annual work plan for 2021 (PAT 2021), and also this plan itself, approved by the Board of the Council during its meeting on December 9th 2020.

As regards the control panel indicators, the following tables show the values obtained compared to the objectives set out. In 2020 a review of the planning was carried out, taking into account the impact of the state of alert due to the COVID-19 pandemic.

Table 2.2.1. Control panel indicators for nuclear installations and the Saelices and Retortillo facilities

INDICATOR	DENOMINATION	OVERALL VALUES	OBJECTIVE
NI 1	Number and percentage of inspections performed, relative to the annual total foreseen	106 - 99%	Performance of the 107 contemplated in the PAT (*)
NI 2	Number and percentage of the total inspections scheduled for the year and performed	100 - 93%	Performance of the 107 contemplated in the PAT (*)
NI 3	Number and percentage of basic programme inspections performed	76 - 95%	Performance of the 81 basic programme inspections included in the PAT. (**)
NI 4	Degree of dedication to the inspection of nuclear facilities	41,175 - 82 %	Attain a value of ≥ 50,000 hours a year
NE 2	Number and percentage of total requests ruled on that have fulfilled the established terms	47-71% (47/66)	100% (in accordance with the terms set out in PG.II.05 ***)
NE 3	Number and percentage of total requests pending ruling that exceed the established terms	23-26% (23/89)	0% (in accordance with the terms set out in PG.II.05***)

(*) In the review of the PAT, the objective for indicators NI1 and NI2 switches from 168 to 107 as a result of the rescheduling of the inspections to be performed due to the state of alert.

(**) In the review of the PAT, the objective for indicator NI3 switches from 128 to 81 due to the state of alert.

(***) PG.II.05. Management procedure on terms for the resolution of proceedings.

Table 2.2.2. Control panel for radioactive facilities

INDICATOR	DENOMINATION	OVERALL VALUES	OBJECTIVE
RI 1	Number and percentage of control inspections performed, relative to the annual total foreseen	735- 105%	Performance of the 702 contemplated in the PAT
RI 2	Number and percentage of licensing inspections performed, relative to the annual total foreseen	84 - 88%	Performance of the 95 contemplated in the PAT
RI 3	Total number of warnings (a) and quarterly ratio (a)/control inspections	25-0,05%	N/A
RI 4	Degree of dedication to the inspection of radioactive facilities, homologated courses and radioactive transport operations overall, defined as the weighted number of inspections of each type	3,399- 38%	Achieve an annual value of ≥ 8,850
RE 1	Number and percentage of total requests ruled on or filed that have fulfilled the established terms	311 - 90%	Issuing of the 344 contemplated in the PAT
RE 2	Number and percentage of total requests ruled on or filed that have fulfilled the established terms	291 - 94% (291/311)	100% (in accordance with the terms set out in PG.II.05) *
RE 3	Number and percentage of total requests pending ruling that exceed the established terms	7 - 5% (7/150)	0% (in accordance with the terms set out in PG.II.05) *

* PG.II.05. Management procedure on terms for resolution of proceedings.

Table 2.2.3. Control panel for emergencies

INDICATOR	DENOMINATION	OVERALL VALUES	OBJECTIVE
ETS	Average time, expressed in minutes, for the activation of all the members of stand-by teams in emergency drills	13	Achieve an average annual value of ≤ 30 minutes
ETR	Average time, expressed in minutes, for the activation of all the members of stand-by teams in actual emergencies	17	Achieve an average annual value of ≤ 30 minutes
ECS	Quality of response to emergency drills during the period considered[(1)]	126	Achieve an annual value of ≥ 36
ECR	Quality of response to actual emergencies during the period considered	99	Achieve an annual value of ≥ 105

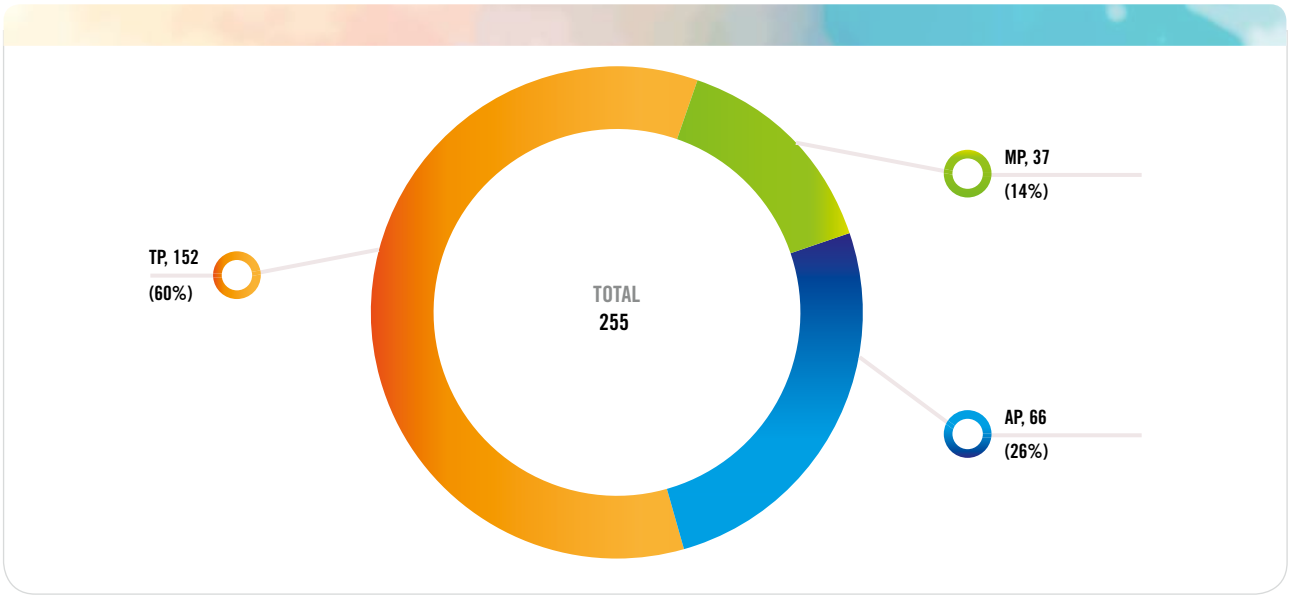
[(1)] In estimating this, consideration is given to average activation times and the associated statistical dispersion..

2.2.1. Internal procedures and audits

The documentation of the management system consists of a series of high-level documents and three different types of procedures: management (MP), administrative (AP) and technical (TP).

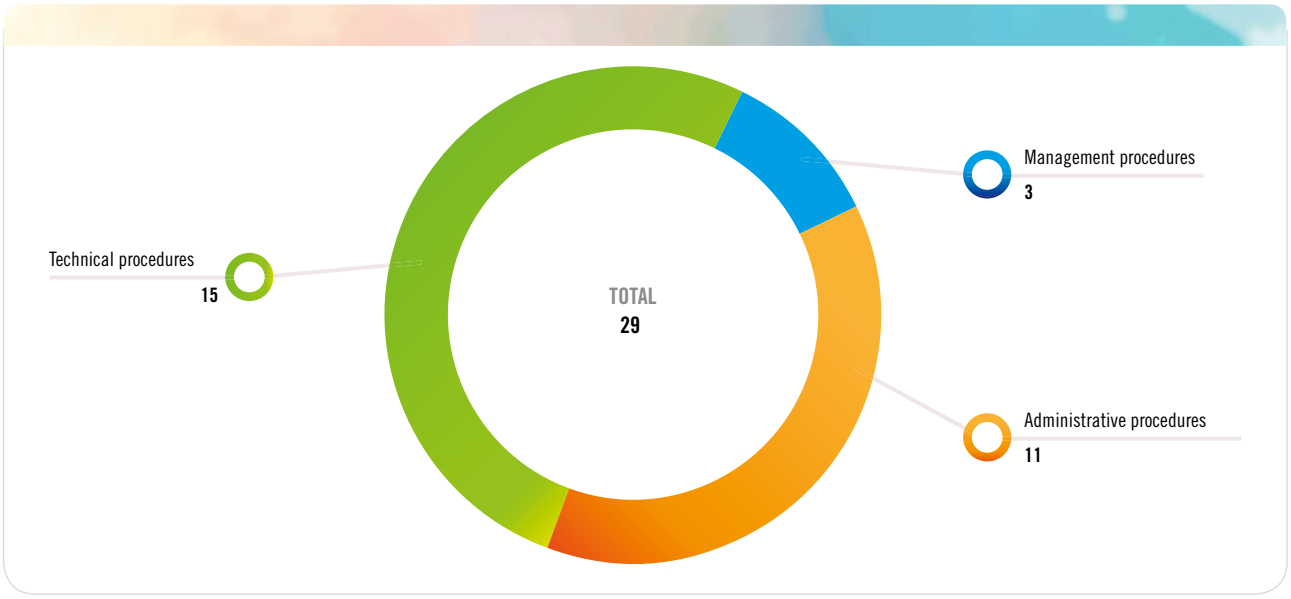
The CSN currently has 255 procedures, distributed as follows: 37 MP; 66 AP and 152 TP. (Refer to diagram 2.2.1.1. The percentages of each type are indicated in parenthesis).

Diagram 2.2.1.1. Breakdown of CSN procedures in 2020 (total 255)



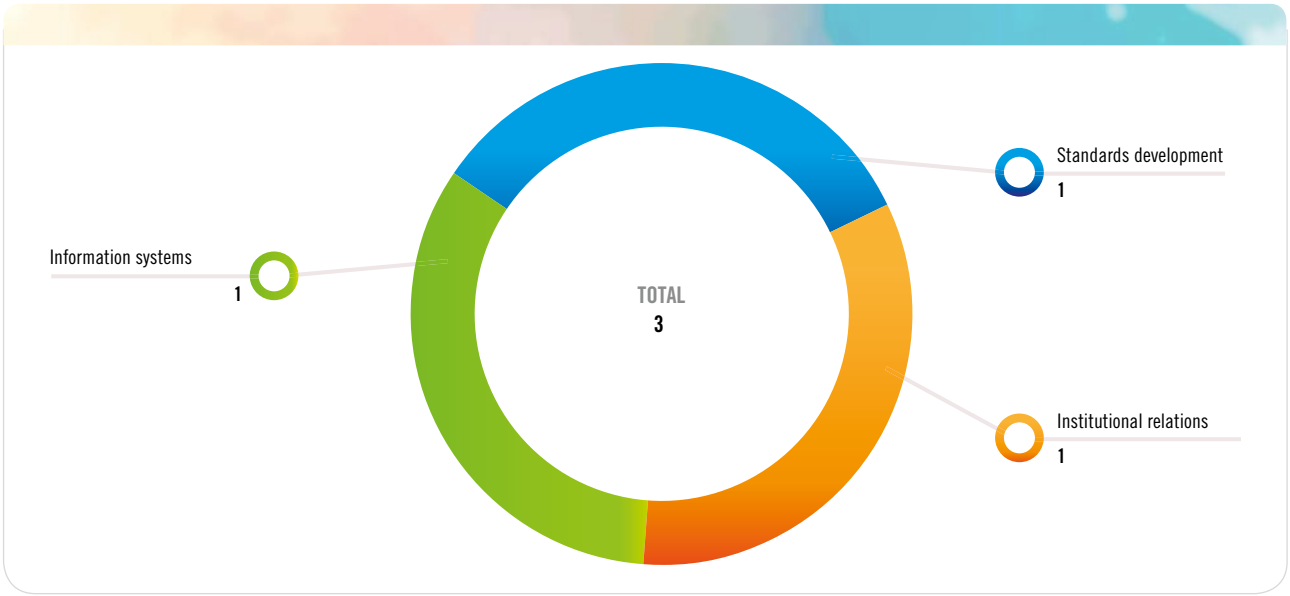
Twenty-nine procedures were published and reviewed in 2020.

Diagram 2.2.1.2. Breakdown of procedures published or reviewed in 2020 (total 29)



Three processes have been audited during 2020 (standards development, institutional relations and information systems).

Diagram 2.2.1.3. Internal audits performed at the CSN



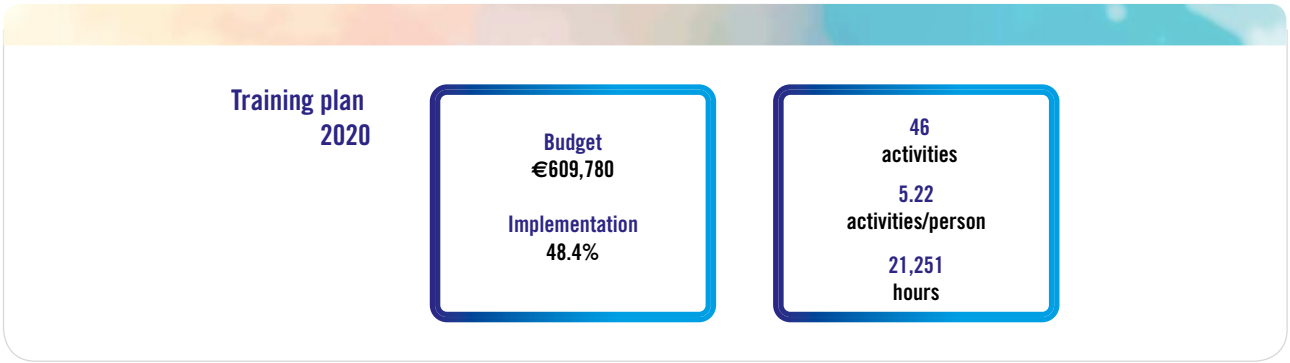
2.2.2. Training Plan

In 2020 the Training Plan (ATP) was structured around seven programmes: nuclear safety and radiological protection technician (divided into four sub-programmes: nuclear safety, radiological protection, transversal management areas and initial technical training), management development, administrative and legal management, prevention of occupational risk and health, computer systems, languages and skills.

Figure 2.2.1.1 summarises relevant information on the implementation of the training plan and its budget in 2020.

It should be pointed out that in 2020 the CSN initiated a project aimed at the development and implementation of a systematic approach to training (SAT) to be applied to all the personnel of the organisation and aimed at optimising the Council's training processes. This methodology provides a logical progression for the identification of the skills required for performance in a job post and for the subsequent drawing up and implementation of a training programme aimed at achieving and maintaining the said skills.

Figure 2.2.2.1. Implementation of annual training plan in 2020



2.2.3. Knowledge Management

Knowledge conservation sessions have been carried out on-line in 2020, with the participation of staff members of the sub-directorates of Nuclear Technology (STN), Nuclear Facilities (SCN) and Emergency Response (SEP) reaching retirement age during the year.

2.3. Research and development

In 2016 the Board of the CSN approved the R&D Plan for the period 2016-2020, which incorporates the improvements identified during the development of its predecessor and sets out the CSN's strategic courses of action and objectives in relation to R&D. As regards its implementation, a set of procedures is available for optimum management.

2.3.1. CSN R&D Plan in 2020

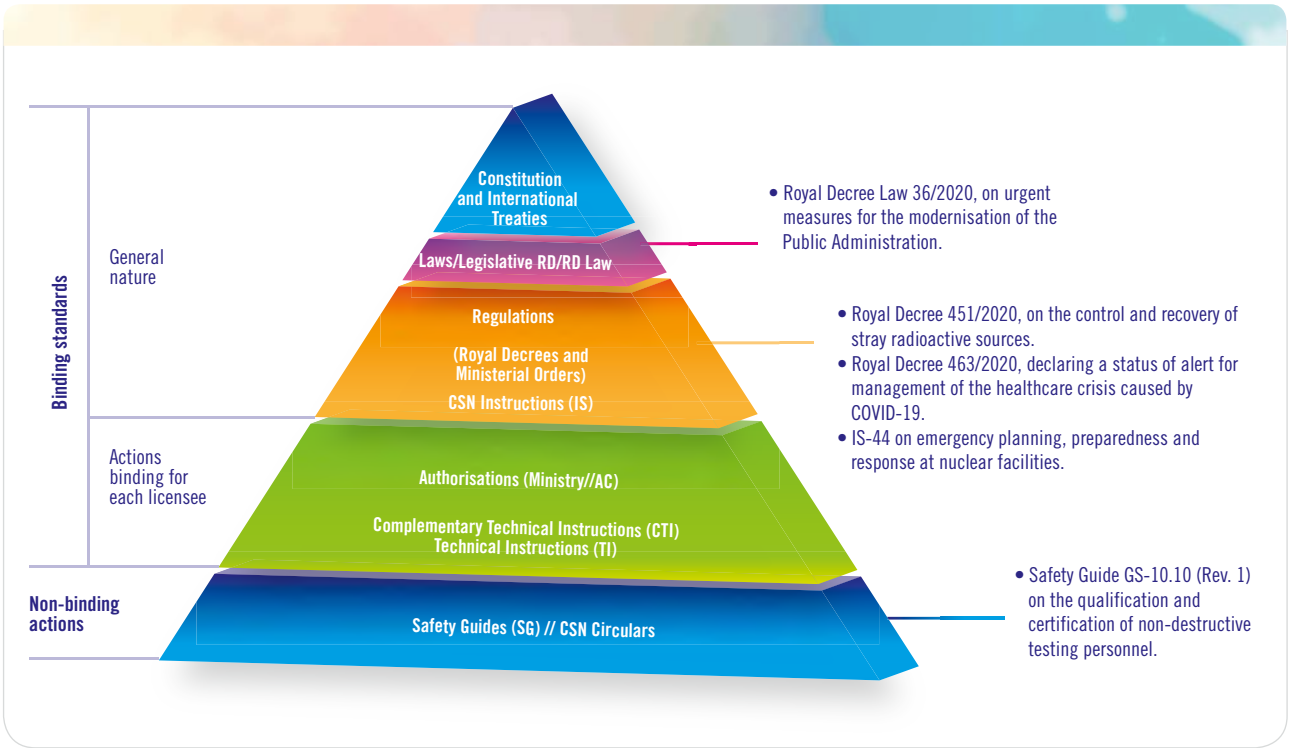
During this year the Board of the CSN has approved a total 14 agreements for R&D projects. As of December 31st 2020, all of these agreements were signed and in force.

The carried over budget assigned to R&D during the 2020 financial year amounted to 2,675,000 euros. Of this total, 1,297,431 euros were implemented, this representing an execution rate of 48.5 %.

2.4. Legal and regulatory activity

In keeping with its legal framework and functions, the CSN proposes regulations relating to nuclear safety and radiological protection to the Government, both new regulations and the review of those already in existence. Likewise, it draws up and approves its own technical standards, which may be Instructions, Circulars and Guidelines relating to installations and activities included within its realm of competence. Figure 2.4.1 represents the CSN's standards-related activities in 2020.

Figure 2.4.1. Standards pyramid. Legal activity in 2020



As part of the CSN's regulatory activity in 2020, the Complementary Technical Instructions and Technical Instructions listed in table 2.4.1 were issued.

Table 2.4.1. CTI's and TI's issued by the CSN in 2020

CSN COMPLEMENTARY TECHNICAL INSTRUCTIONS (CTI's) IN 2020		
SUBJECT	**DATE OF ISSUE**	**INSTALLATION (*)**
Replacement of continuous fire watches required in the event of unavailability of FP systems with roving fire watches	18-12-2020	Applicable to all operating nuclear power plants
CTI transmittal letter on renewal of operating permit	31-7-2020	ALMARAZ NPP
CTI transmittal letter on renewal of operating permit	28-7-2020	VANDELLOS II NPP
Drawing up of an environmental qualification programme for mechanical equipment	28-7-2020	Applicable to all operating nuclear power plants except Vandellós II NPP
Accreditation and access of CSN inspectors to facilities	25-3-2020	Applicable to all operating nuclear power plants plus Sta Maria de Garoña NPP and the Juzbado Fuel Manufacturing Facility
FP brigade member physical aptitude tests	13-3-2020	Applicable to all operating nuclear power plants
El Cabril cell 29 corrective actions	22-7-2020	El Cabril waste disposal facility
CSN TECHNICAL INSTRUCTIONS (TI) IN 2020		
SUBJECT	**DATE OF ISSUE**	**IINSTALLATION (*)**
Corrective actions deriving from root cause analysis	20-10-2020	Sta Maria de Garoña NPP SMG
Environmental qualification of mechanical components	25-6-2020 (ALM) 29-7-2020 (Rest)	Applicable to all operating nuclear power plants except Vandellós II NPP
WENRA recommendations regarding forged parts with high concentrations of carbon	27-7-2020	Generic to all operating PWR plants
Impact of COVID on the implementation of the new EM-I meteorological tower	5-6-2020	ALMARAZ NPP
Impact of COVID on corrective actions on ENUN-A1-02 cask	5-6-2020	ALMARAZ NPP
Venting systems filter testing in accordance with ASME S10-1989	10-3-2020	ASCO NPP
Corrective actions on ENUN-A1-02 cask	28-1-2020	ALMARAZ NPP

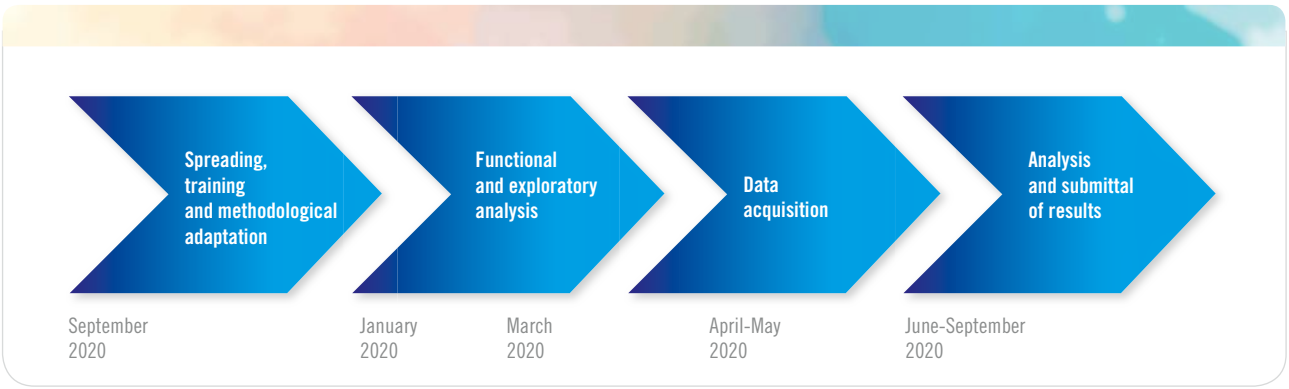
(*) NOTE: ALM: Almaraz; ASC: Ascó; COF: Cofrentes; TRI: Trillo; VAII: Vandellós II; SMG: Sª Mª Garoña

2.5. Council safety culture

The CSN's Strategic Plan for the period 2020-2025 establishes the performance of a self-assessment of the safety culture as a priority objective during the period 2020-2021.

The CSN contracted the Centre for Social and Technical Research (CISOT)- CIEMAT, which initiated the assessment project in September of 2020. This project has been structured in four stages. The first stage, relating to coverage, training and methodological adaptation, was completed during 2020.

Figure 2.5.1. Stages of the safety culture assessment project



3. OVERALL VIEW OF NUCLEAR SAFETY AND RADIOLOGICAL PROTECTION IN 2020

The CSN has continued to perform its functions and areas of competence. Nevertheless, activities requiring a physical presence and visits to the facilities, such as supervision and control, have been impacted by confinement and restrictions on mobility and the new measures associated with protection against the pandemic.

Generally speaking, all the nuclear and radioactive facilities operated safely throughout 2020. Likewise, the CSN has guaranteed that all the operating conditions of the installations, practices and activities for which it is responsible have been normal.

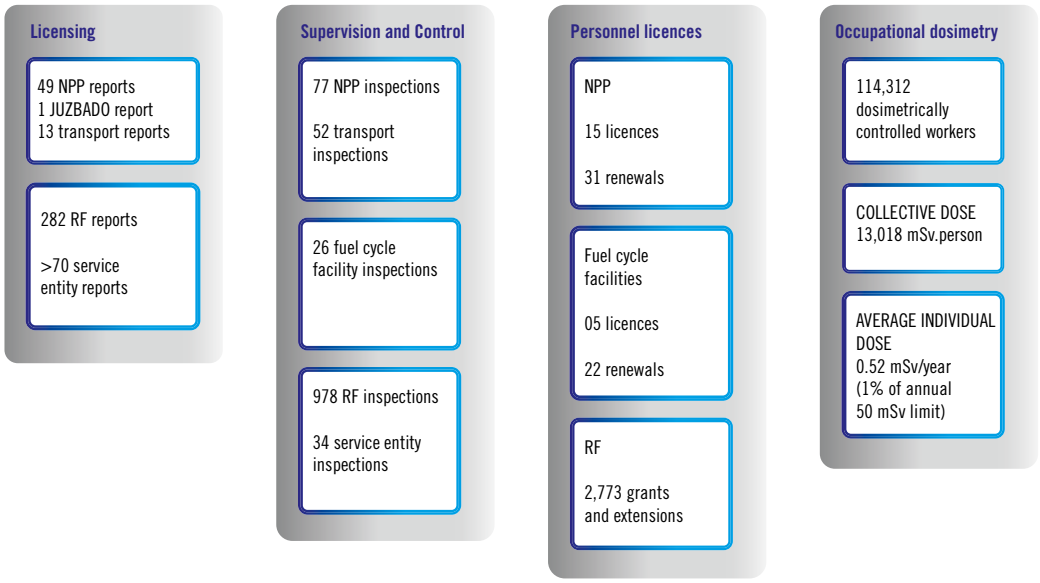
The quality of the environment around the facilities has remained under acceptable radiological conditions, as may be gathered from the results of the environmental radiological surveillance programmes, with no risk for the public or the environment.

The overall assessment of the operation of authorised installations is accomplished through analysis of the results provided by the Integrated Plant Supervision System (SISC), along with the other supervision and control processes put in place by the CSN for the different facilities (nuclear and radioactive) and for the transport of radioactive material.

One of the mechanisms used in situation analysis is the tracking of operating incidents and reported events, especially those classified at levels higher than zero on the IAEA's International Nuclear and Radiological Events Scale (INES Scale). There are also other mechanisms for evolution studies and the identification of trends, such as the dosimetry results of professionally exposed workers, relevant modifications requested and warnings and sanctions proposed by the CSN.

The figure shown below summarises the main data corresponding to the licensing, supervision and control activities carried out by the CSN in 2020. These activities are detailed in the following sections.

Figure 3.1. Summary of licensing, supervision and control activities in 2020



The following diagrams and figures summarise the data corresponding to reported events and coercive actions at nuclear and radioactive facilities and in transport in 2020.

Diagram 3.1. Events reported on the INES scale at nuclear power plants and radioactive facilities, in transport and at the Juzbado fuel manufacturing facility in 2020

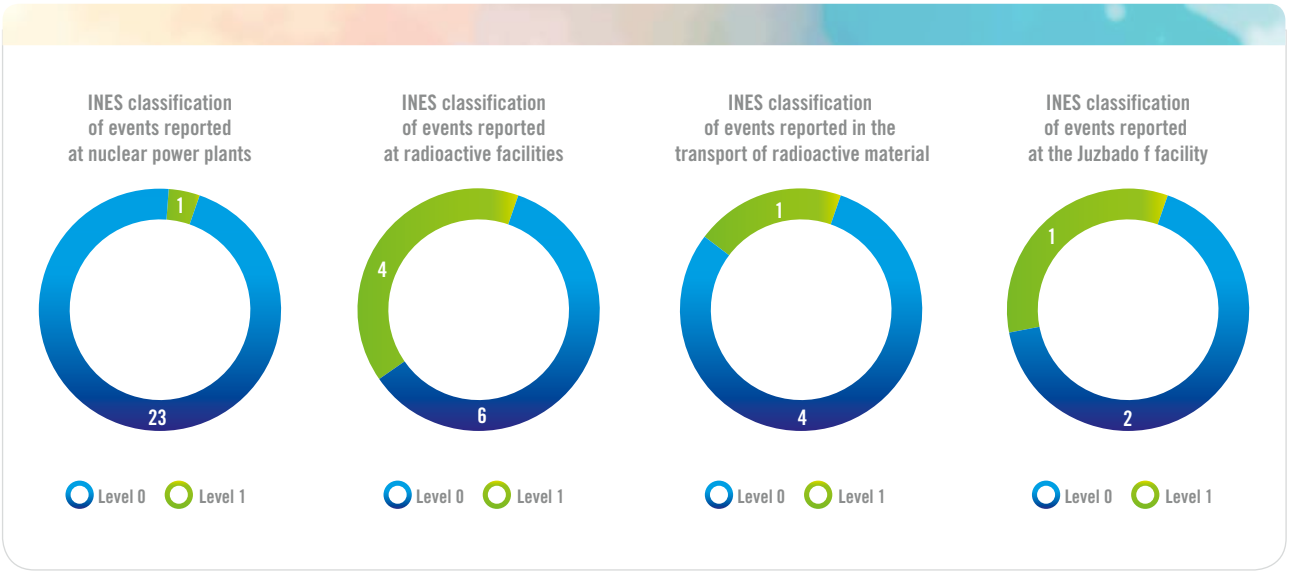
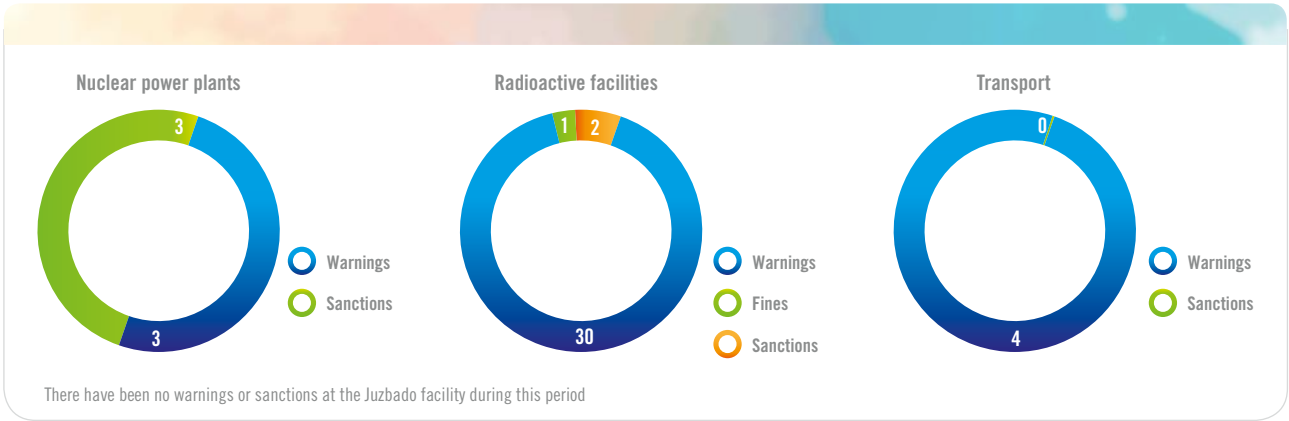


Diagram 3.2. Warnings and sanctions to nuclear power plants and radioactive facilities, in transport and to the Juzbado fuel manufacturing facility in 2020



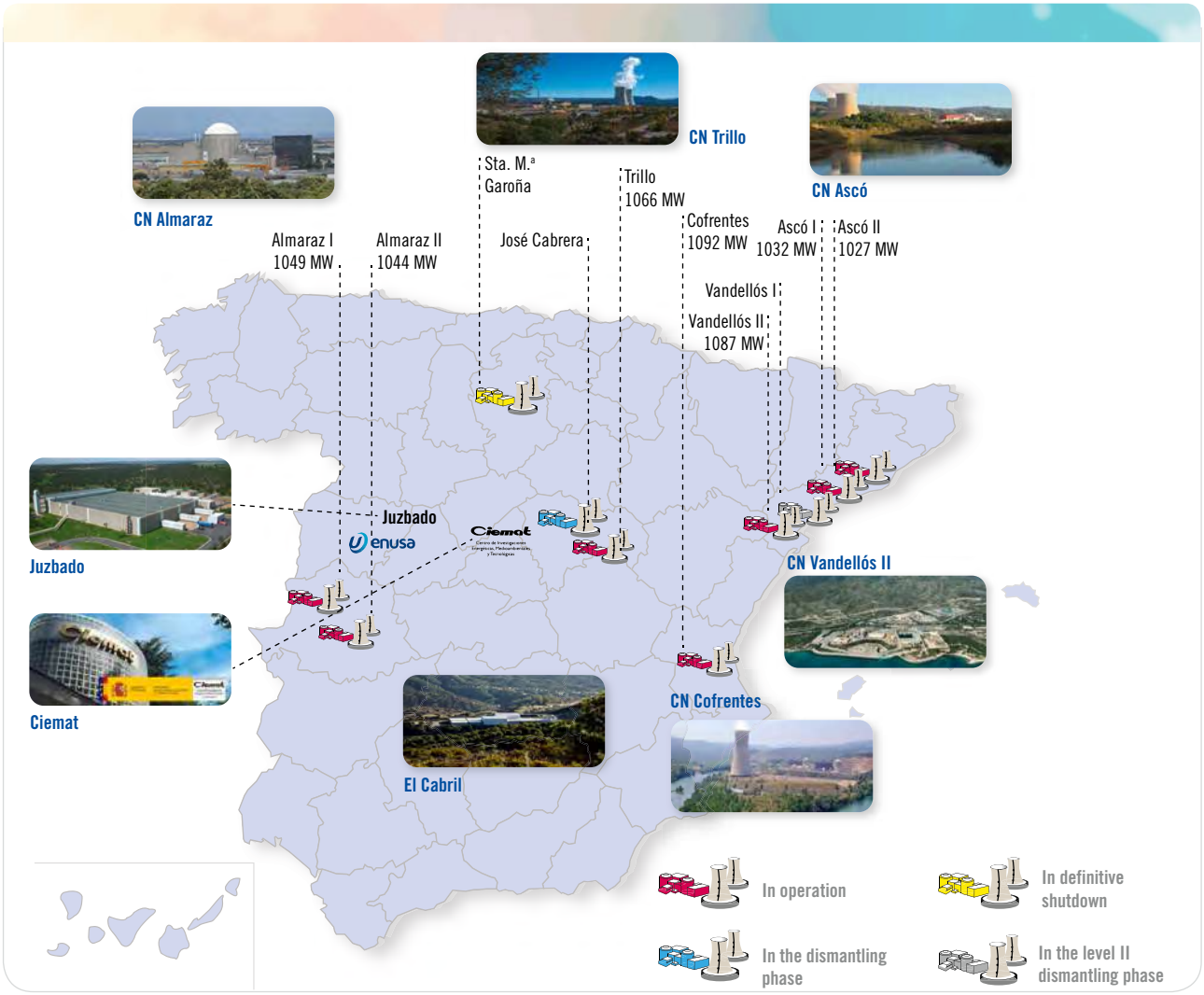
There have been no warnings or sanctions at the Juzbado facility during this period

4. MONITORING AND CONTROL OF FACILITIES AND ACTIVITIES

4.1. Operating nuclear power plants

Figure 4.1.1 shows the location of Spain's existing nuclear facilities: nuclear power plants in operation and in the dismantling phase and other nuclear installations. The following sections summarise the characteristics and activities of each during 2020.

Figure 4.1.1. Location of nuclear facilities



4.1.1. Nuclear power plant operating permits

Table 4.1.1.1 summarises the operating data of the nuclear power plants for 2020.

Table 4.1.1.1. Summary of nuclear power plant operating data for 2020

	ALMARAZ I/II	ASCÓ I/II	VANDELLÓS II	TRILLO	GAROÑA	COFRENTES
Permit in force	23-07-20 23-07-20	02-10-11 02-10-11	27-07-20	03-11-14	Since 06-07-13 definitively shut down	20-03-11*
Period of validity (years)	01/11/2027 31/10/2028	10 10	10	10	N/A	30/11/2030
Net production (GWh)	6913.124 8366.401	7689.479 7330.164	8872.944	7729.608	—	9467.070
Load factor (%)	77.69 95.15	88.26 84.65	96.78	88.38	—	95.60
Operating factor (%)	80.42 99.50	89.51 86.07	99.64	90.86	—	99.50
Hours coupled to grid	7064.5 8740.5	7862.54 7560.54	8752.42	7981	—	9384.967
Refuelling outages	14-04/21-06 NO	28-04/08-06 03-10/21-11	NO	18-05/20-06	N/A	N/A

*As of the date of preparation of this report, the Miterd has renewed the operating permit for Cofrentes NPP, the new permit having been in force since 20-03-21.

In the Prologue section, Major activity 1 section of this report describes in detail the methodology used by the CSN for the issuing of favourable reports in response to the requests for renewal of the operating permits for the Almaraz I and II and Vandellós II nuclear power plants.

Table 4.1.1.2. End of design lifetime and definitive shutdown dates

END OF DESIGN LIFETIME AND DEFINITIVE SHUTDOWN DATES (BOARD CASE STUDY 1565)		
REACTOR	END OF DESIGN LIFETIME DATE	DEFINITIVE SHUTDOWN DATE
ALMARAZ I	May 1st 2021	November 1st 2027
ALMARAZ II	October 8th 2023	October 31st 2028
ASCÓ I	August 29th 2023	October 2nd 2030
ASCÓ II	October 23rd 2025	October 2nd 2031
COFRENTES	October 14th 2024	November 30th 2030
VANDELLÓS II	December 12th 2027	February 2035 (*)
TRILLO	May 23rd 2028	May 2035

All of the Spanish NPP's will come to the end of their 40-year service in the near future. This means that the corresponding operating permit renewal processes must include the documentation of the analyses justifying Long-Term Operation (LTO), which is to be submitted 3 years before the expiry of the permit currently in force. Table 4.1.1.2 shows the dates in each case. The requests reported on by the CSN in 2020 correspond to the Almaraz I and II and Vandellós II plants.

The major activities section included at the beginning of this report provides a complete explanation of the management of the operating permit renewals and associated documentation.

Table 4.1.1.3 summarises the milestones of submittal of the documentation associated with the renewal of the operating permit (PSR and LTO), including the cut-off date determining the 10-year period covered by the PSR and the PSR basic document, subject to CSN approval, all the above in accordance with GS.1.10 revision 2.

In March 2020, the Cofrentes and Ascó I and II NPP's submitted their respective requests for renewal of their operating permits to the MITERD, along with the required documentation, including the PSR. The owner of Cofrentes NPP, Iberdrola SA, has requested renewal of the operating permit up to November 30th 2030, and the owner of Ascó NPP, the Asociación Nuclear Ascó-Vandellós II, A.I.E, has requested renewal of the OP for groups I and II of Ascó NPP for 9 and 10 years, respectively.

4.1.2. General aspects of CSN supervision and control. Operating Experience

Every year the CSN carries out an overall assessment of the operation of the nuclear power plants, taking into consideration fundamentally the results of the SISC, reported events, the assessment of radiological impact, the dosimetry of the workers, the licensing requests and significant requests for modifications, warnings and sanctions and operational incidents.

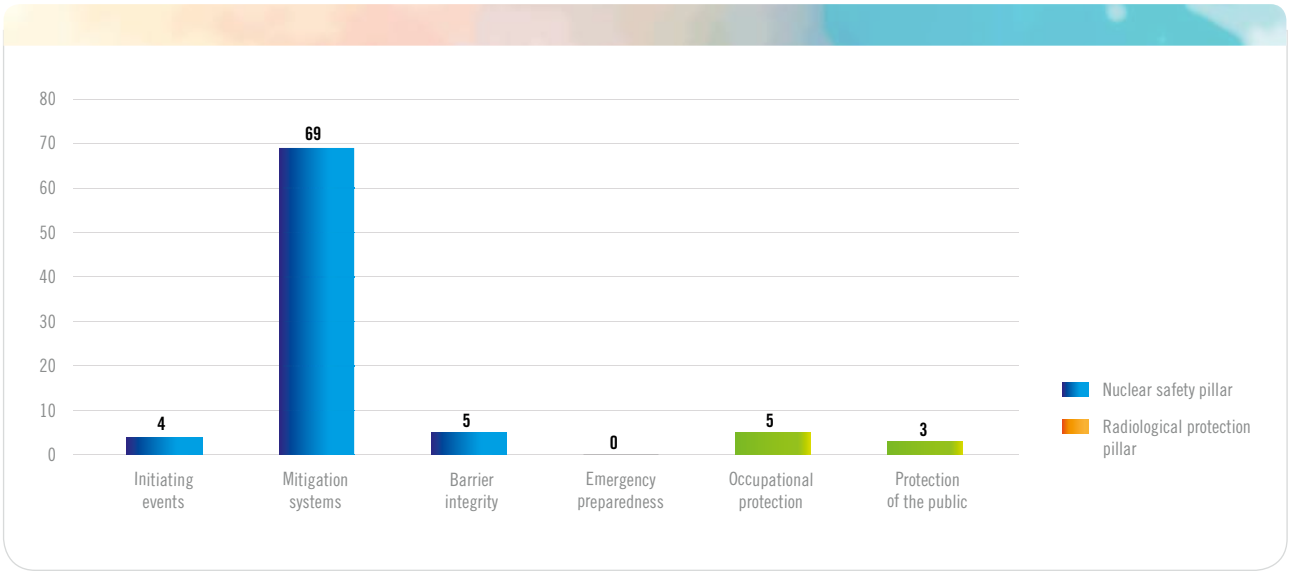
Table 4.1.1.3. Licensing milestones associated with the renewal of operating permits

	THREE YEARS < OP EXPIRY LTO DOC	Submittal PSR Base Doc PSR	CUT-OFF DATE PSR	SUBMITTAL PSR DOC	OP EXPIRY
Almaraz	07/06/2017	31/12/2017	30/06/2018	31/03/2019	07/06/2020
Ascó	02/10/2018	31/12/2018	30/06/2019	31/03/2020	02/10/2021
Cofrentes	20/03/2018	31/12/2018	30/06/2019	31/03/2020	20/03/2021
Trillo	16/11/2021	31/12/2021	30/06/2022	31/03/2023	16/11/2024
Vandellós II	25/07/2017	31/12/2017	30/06/2018	31/03/2019	25/07/2020

4.1.2.1. Integrated Nuclear Power Plant Supervision System (SISC)

Table 4.1.2.1.1 summarises the findings of inspections encountered for the different safety pillars defined by the SISC in 2020.

Diagram 4.1.2.1.1. Inspection findings encountered in the different safety pillars defined by the SISC



The most significant results of the SISC regarding the functioning of the operating nuclear power plants in 2020 are shown in table 4.1.2.1.2.

At the end of the state of alert, the planning of the ATP 2020 plan was reviewed with a view to adapting the forecasts of the supervision process. This review was approved by the

Table 4.1.2.1.2. Overall results of the SISC in 2020

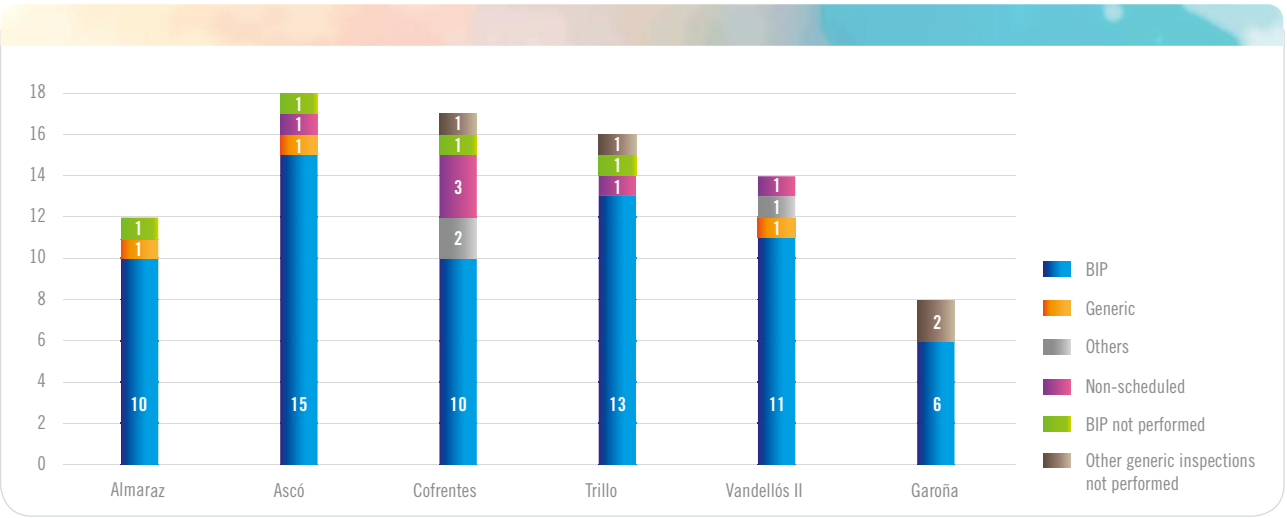
As of the end of 2020, all the operational indicators were in green
The 86 inspection findings categorised in 2020 were green
The plants were in the normal situation known as licensee response (LR) in the SISC action matrix, except Trillo NPP, which throughout the first quarter continued in the regulatory response (RR) situation that had existed since the second quarter of 2019 as a result of a white finding due to deficiencies in the application of the protective measures of the site emergency plan (SEP) identified during the annual emergency drill
No significant findings have been declared in relation to transversal components
A finding was identified at Santa María de Garoña in application of the specific supervision system known as SSG. As of December 31st 2020, this was still pending categorisation
No significant transversal components (STC) have been declared

Board of the CSN in its session of November 11th 2020 and meant the cancellation of 40 of the 109 inspections initially included in the Basic Annual Inspection Programme (BAIP) and 9 of the 19 generic inspections, this implying a reduction of 42% in the overall inspections initially scheduled at the nuclear power plants.

A total 77 inspections were performed at the operating plants and at Santa María de Garoña NPP in 2020, 71 of which were initially scheduled and 6 non-scheduled.

Diagram 4.1.2.1.1 shows the number of inspections performed in 2020 for each operating plant, including Sta Maria de Garoña.

Diagram 4.1.2.1.2. Inspections at operating nuclear plants, including Sta Maria de Garoña, in 2020



4.1.2.2. Reported events and proposals for sanctions proceedings and warnings

In 2020 the nuclear power plant licensees reported 24 events, in accordance with CSN Instruction IS-10 on event notification criteria. All were classified on level 0 on the International Nuclear Event Scale (INES), except for the event involving massive non-compliance with FP fire barrier resistance times, reported by Vandellós II , which was classified on level 1.

The CSN has issued 3 warnings and has proposed 3 sanctions proceedings to the Ministry for Ecological Transition and the Demographic Challenge. Table 4.1.2.2.1 summarises relevant information on the underlying causes of these coercive actions.

Table 4.1.2.2.1. Information on NPP warnings and sanctions proposals

Warnings	Ascó NPP	Non-compliance with Operating Technical Specification 3/4.6.1.7 "Containment Structural Integrity". Board agreement of 04-03-2020
	Ascó NPP	Non-compliance with radioactive waste and spent fuel management plan (RWandSFMP). Board agreement of 05-11-2020
	Vandellós II NPP	Non-compliance with RWandSFMP and Complementary Technical Instruction No 4 associated with operating permit. Board agreement of 05-11-2020
Sanctions proceedings proposals	Santa María Garoña NPP	Non-compliance with Shutdown Radiological Protection Manual regarding licensee responsibilities relating to the ALARA programme. Board agreement of 26-02-2020 to propose the initiation of sanctions proceedings to the MITERD
	Almaraz NPP	Non-compliance with requirement b.5 of Complementary Technical Instruction No 11 associated with the operating permit, in relation to the fixed filtering systems flow measurement instrumentation. Board agreement of 4-03-2020 to propose the initiation of sanctions proceedings to the MITERD
	Ascó NPP	Non-compliance with the Quality Assurance Manual in relation to venting systems. Board agreement of 22-07-2020 to propose the initiation of sanctions proceedings to the MITERD

4.1.2.3. Monitoring and analysis of Operating Experience

The following activities relating to the operating experience (OE) of nuclear facilities were carried out in 2020:

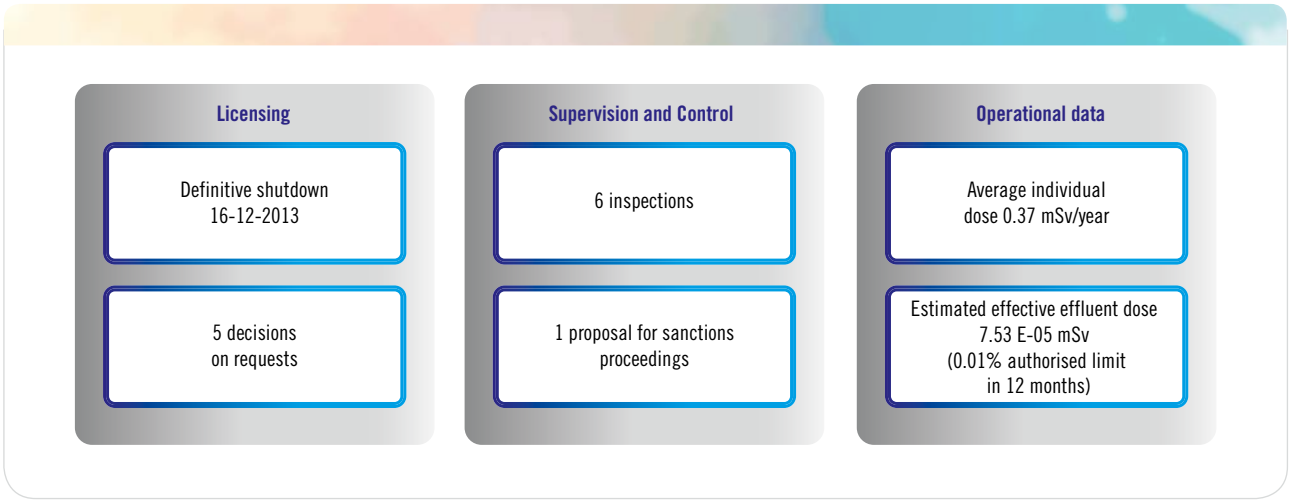
- The CSN submitted a report on massive non-compliance with the fire resistance times of the fire-fighting (FF) system protective barriers at Vandellós II NPP to the IAEA/NEA international incident reporting system (IRS).
- Issuing of reports on 2 events classified as INES 1 in 2020 relating to non-compliance with the fire resistance times of the fire-fighting (FF) system protective barriers at Vandellós II NPP and the inadvertent accumulation of nuclear material at the Juzbado fuel manufacturing facility.

4.1.3. Specific aspects of each nuclear power plant

Summarised graphically below are the most significant milestones regarding the status of the operating nuclear power plants, including Sta Maria de Garoña, during 2020.

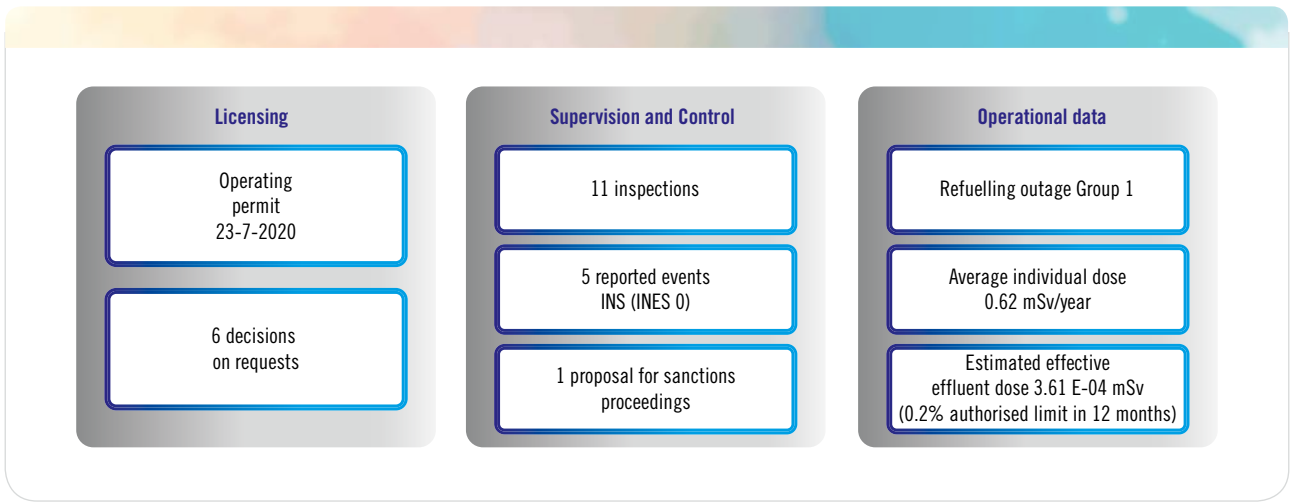
4.1.3.1. Santa María de Garoña nuclear power plant

Figure 4.1.3.1.1. Most significant activities at Sta Maria de Garoña NPP in 2020



4.1.3.2. Almaraz nuclear power plant

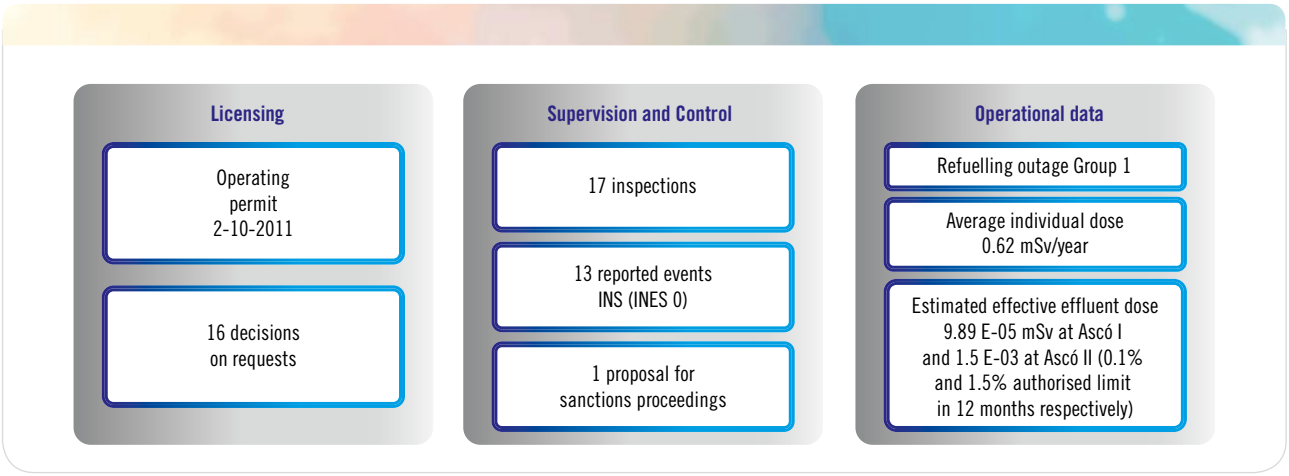
Figure 4.1.3.2.1. Significant activities at Almaraz NPP in 2020



Detailed information on the operating permit renewal process may be found in the section **Prologue.** **Major activity 1** of this report.

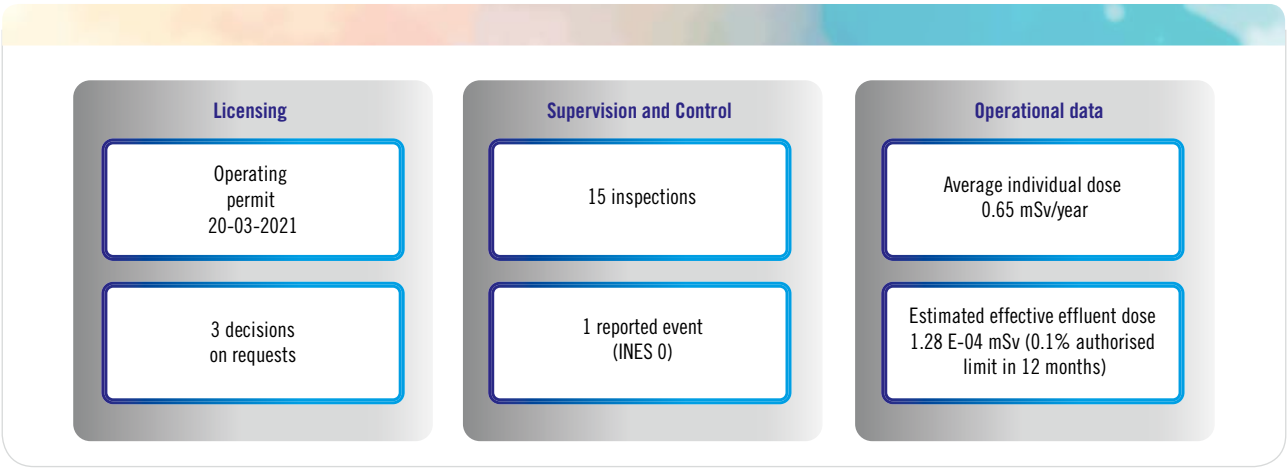
4.1.3.3. Ascó nuclear power plant

4.1.3.3.1. Significant activities at Ascó NPP in 2020



4.1.3.4. Cofrentes nuclear power plant*

Figure 4.1.3.4.1. Significant activities at Cofrentes NPP in 2020



* At the time of drawing up of the report, the operating permit had been renewed on March 20th 2021.

4.1.3.5. Vandellós II nuclear power plant

Figure 4.1.3.5.1. Significant activities at Vandellós II NPP in 2020

Detailed information on the operating permit renewal process may be found in the section **Prologue.**
Major activity 1 of this report.

4.1.3.6. Trillo nuclear power plant

Figure 4.1.3.6.1. Significant activities at Trillo NPP in 2020

4.2. Nuclear power plants in the dismantling phase

There are currently two nuclear power plants in the dismantling phase in Spain, with different degrees of implementation: Vandellós I NPP, located in Tarragona, and José Cabrera NPP, in Guadalajara. In addition, in May 2020 Enresa issued a request to the MITERD for authorisation to undertake phase 1 of the dismantling of Santa María de Garoña NPP, located in the province of Burgos, which has been in a situation of definitive shutdown since 2013. The CSN has initiated the assessment of this request.

Table 4.2.1 shows a summary of the nuclear power plants in the dismantling phase, their location, licensing milestones, etc.

Table 4.2.1. Overall view of the characteristics of nuclear power plants in the dismantling phase

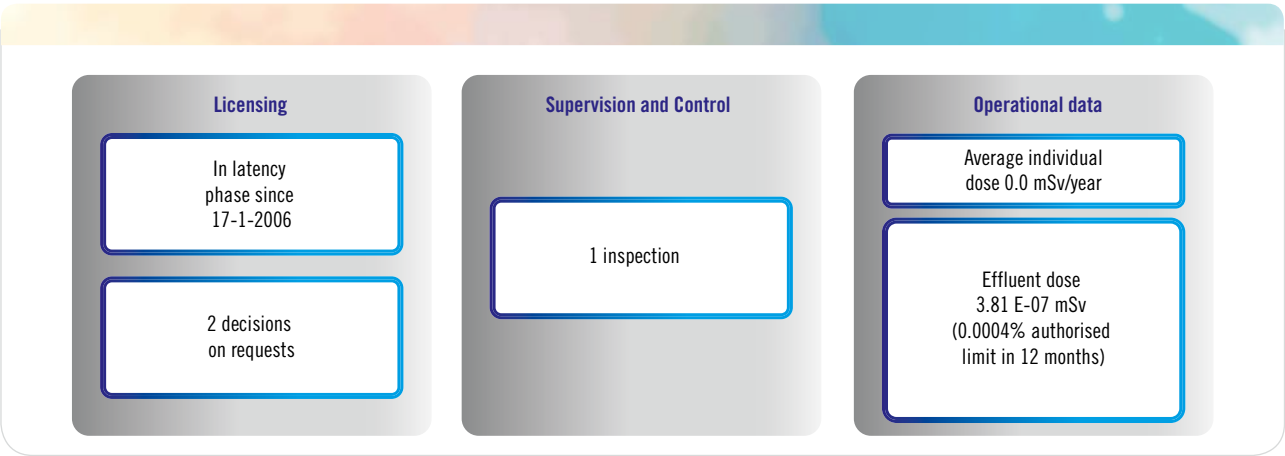
PROGRAMME	FACILITY (LOCATION)	LICENSING MILESTONES	STATUS	PERFORMANCE
Vandellós 1 Nuclear Power Plant dismantling project	Vandellós 1 (Vandellós Tarragona)	Start-up Feb-1972 Declaration of shutdown July 1990 Dismantling Jan-98 Latency January 2005	Latency (dismantled to level 2)	1998-2004
José Cabrera Nuclear Power Plant dismantling project	José Cabrera (Zorita de los Canes-Guadalajara)	Start-up Oct-1968 Declaration of shutdown April 2006 Dismantling Feb-2010	Performance of dismantling and decommis-sioning plan	2010-2020

The activities carried out at each of the facilities were performed throughout 2020 within the safety limits and conditions required and without any radiological impact for the public and the environment.

Summarised graphically below are the most significant milestones on the status of the nuclear power plants in the dismantling phase during 2020.

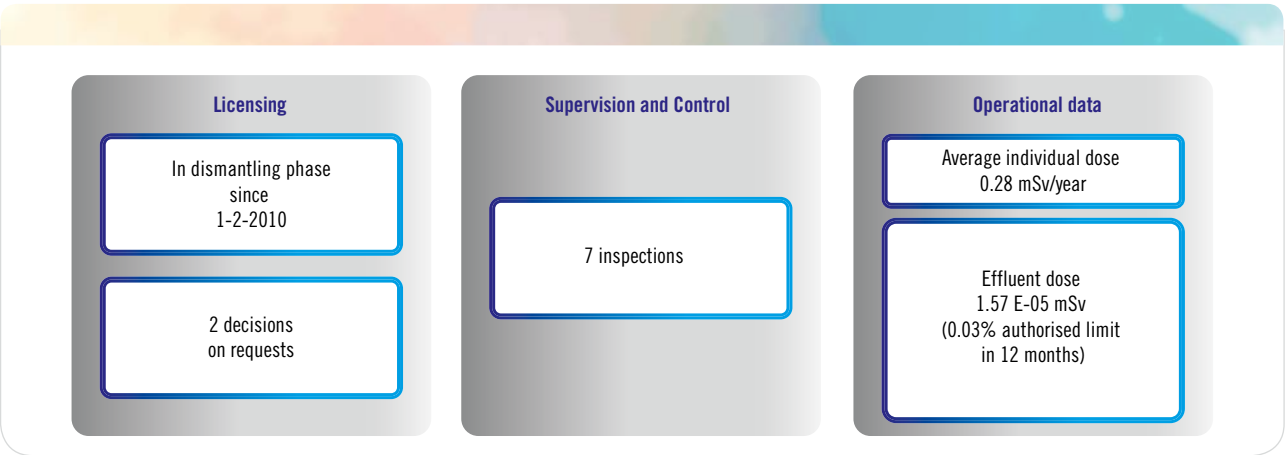
4.2.1. Vandellós I nuclear power plant

Figure 4.2.1.1. Significant activities at Vandellós I NPP in 2020



4.2.2. José Cabrera nuclear power plant

Figure 4.2.2.1. Significant activities at José Cabrera NPP in 2020

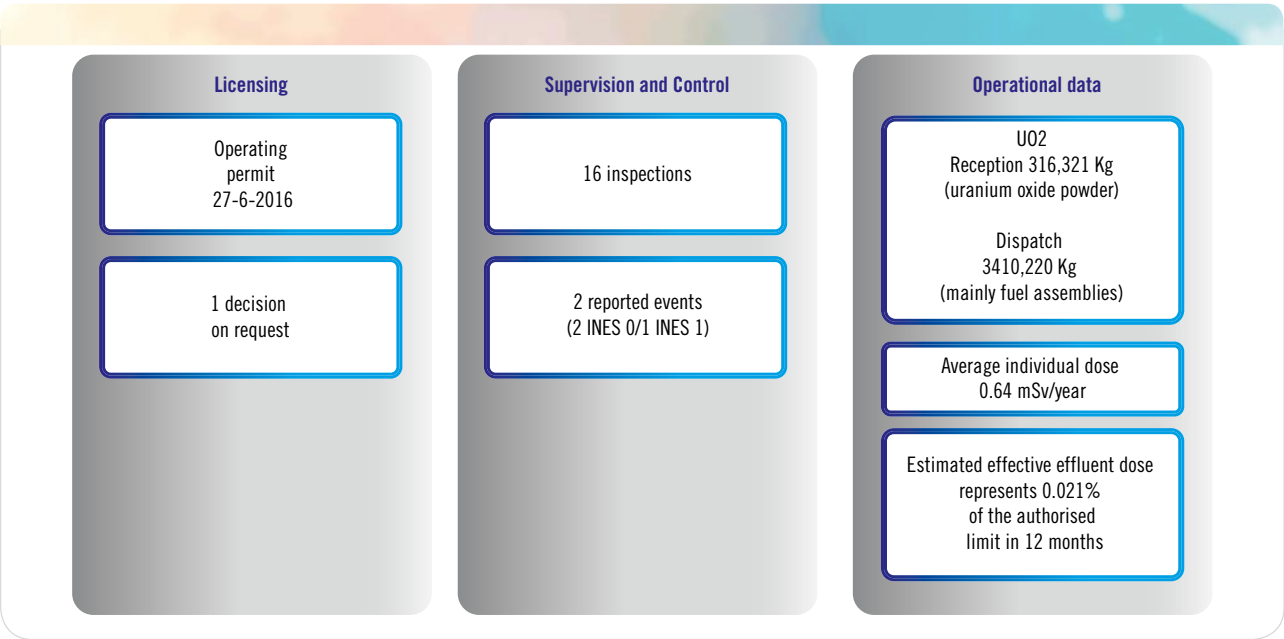


4.3. Fuel cycle facilities; radioactive waste storage and Ciemat

4.3.1. Juzbado fuel assembly manufacturing facility

The Juzbado nuclear facility manufactures fuel assemblies containing uranium oxide and others with a mix of uranium oxide and gadolinium oxide, with a maximum enrichment of 5% by weight, for pressurised water and boiling water reactors.

Figure 4.3.1.1. Significant activities at the Juzbado fuel assembly manufacturing facility in 2020



4.3.2. Centralised Temporary Storage (CTS) facility

There has been no change affecting this project during 2020.

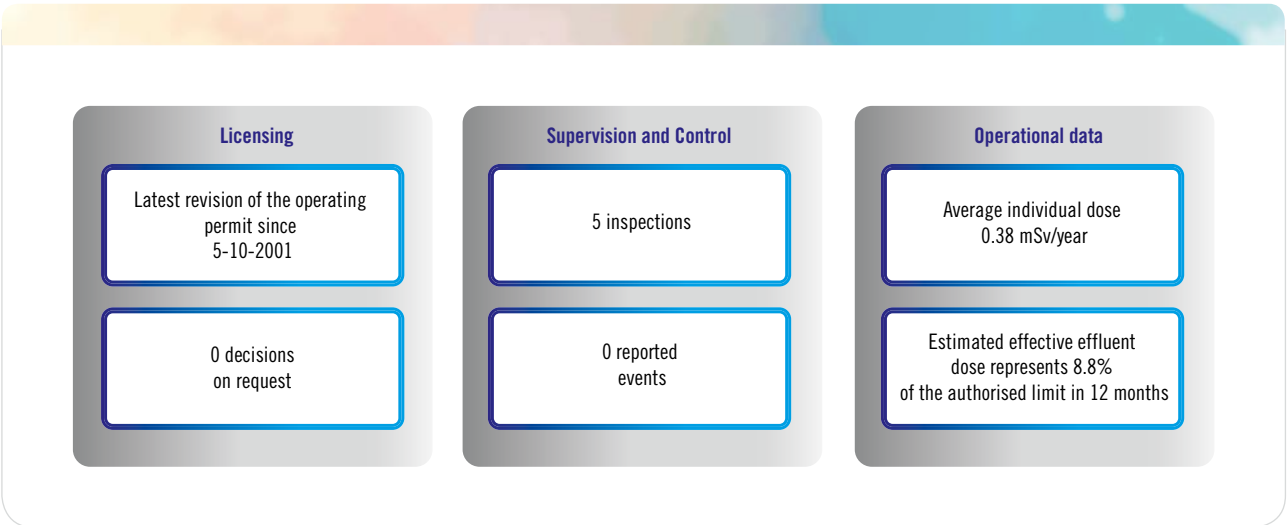
4.3.3. El Cabril Radioactive Waste Disposal facility

The El Cabril Disposal Facility (DF) is a nuclear installation for the storage of low and intermediate level wastes (LILW) and very low level wastes (VLLW). It started operation in 1992 and has been authorised since October 2001.

Figure 4.3.3.1 shows the most significant activities carried out in relation to the El Cabril radioactive waste disposal facility in 2020.

As the most significant activity performed in 2020, special mention may be made of the progress made in solving the problem of the accumulation of water in the end tank of the leachate collection network (LCN) of cell 29 of the Eastern LILW platform.

Figure 4.3.3.1. Significant activities at the El Cabril DF in 2020



4.3.4. Centre for Energy-Related, Environmental and Technological Research (Ciemat)

Figure 4.3.4.1. Significant activities at CIEMAT in 2020

4.3.5. Uranium concentrate mills and uranium mining facilities

Table 4.3.5.1 shows in summary a complete descriptive view of the facilities included under this heading.

Figure 4.3.5.1 shows the location of these sites.

Table 4.4.5.1. Descriptive view of uranium concentrates mills and uranium mining facilities

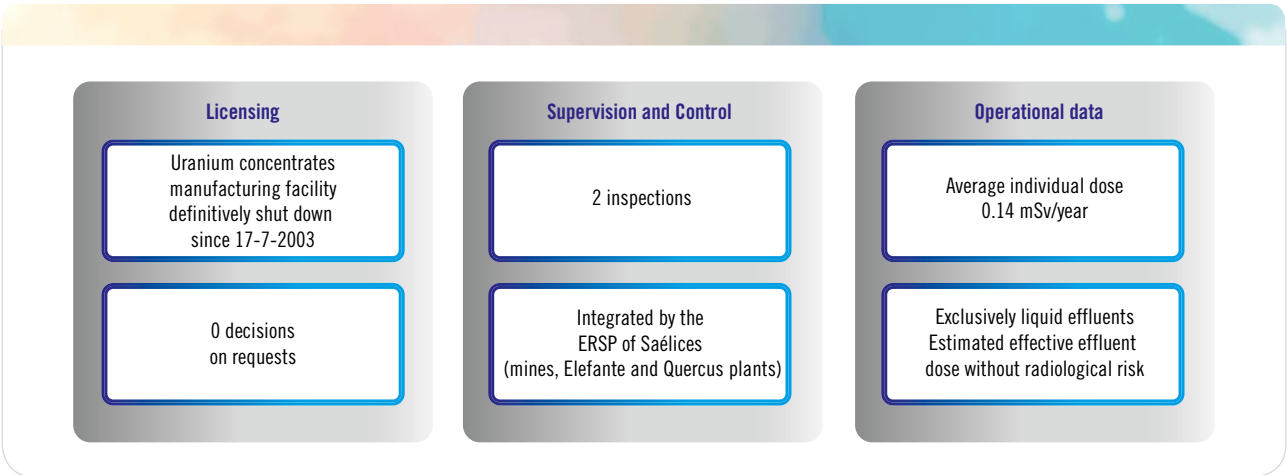
FACILITY		SITUATION	DESCRIPTION 2020
Saelices mining centre	Elefante plant	Dismantled and restored (in period of compliance since 2005)	• Dismantling and restoration plan, including various programmes for environmental radiological surveillance, radiological protection of the workers, physical protection and control of effluents and solid wastes • Inspections: Quercus Plant (2) • The mining installations have been restored and a plan is in place for the surveillance of groundwaters and the stability of structures
	Quercus plant	Shutdown (dismantling and decommissioning permit requested in 2015)	
	Mining facilities	Restored in 2008	
AUM-Andújar Uranium Mill		Dismantled and restored (in period of compliance since 2015)	• Various programmes for environmental radiological surveillance, radiological protection of the workers, physical protection and control of effluents and solid wastes are in operation
Disused Valdemascaño and Casillas de Flores mines (Salamanca)		Dismantled and restored (in period of compliance since 2008)	• Radiological surveillance programmes approved by the CSN in 2010 and 2012 in operation
LOBO-G (Uranium ore plant at La Haba, Badajoz)		Decommissioned in 2004 (tailings stabilised on site)	• During its meeting of October 21st 2020, the Board of the CSN reported unfavourably on the request for release from control of the land adjacent to the restored tailings dyke issued by ENUSA
Retortillo (1st category fuel cycle RF for the manufacturing of U concentrates)		Preliminary permit (granted in 2015 and extended by the MITERD on 11-12-20)	• CSN assessment of the request for the construction permit submitted to the MITERD in 2016 on-going • 1 inspection • Programmes for environmental radiological surveillance, groundwaters, mining site characterisation and operational radiological surveillance in operation

Figure 4.3.5.1. Sites of concentrates plants and uranium mining installations

4.3.5.1. Quercus Plant

Figure 4.3.5.1.1 summarises the most significant activities carried out at the Quercus plant in 2020.

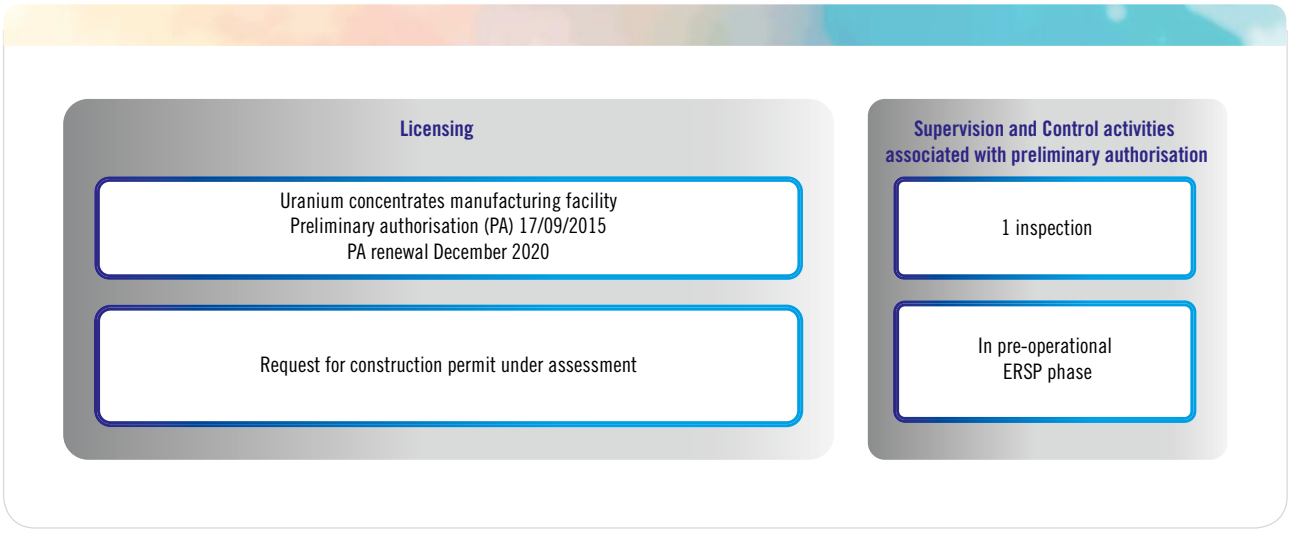
Figure 4.3.5.1.1. Most significant activities carried out at the Quercus plant in 2020



4.3.5.2. Retortillo Plant

Figure 4.3.5.2.1 summarises the most significant activities carried out at the Retortillo plant in 2020.

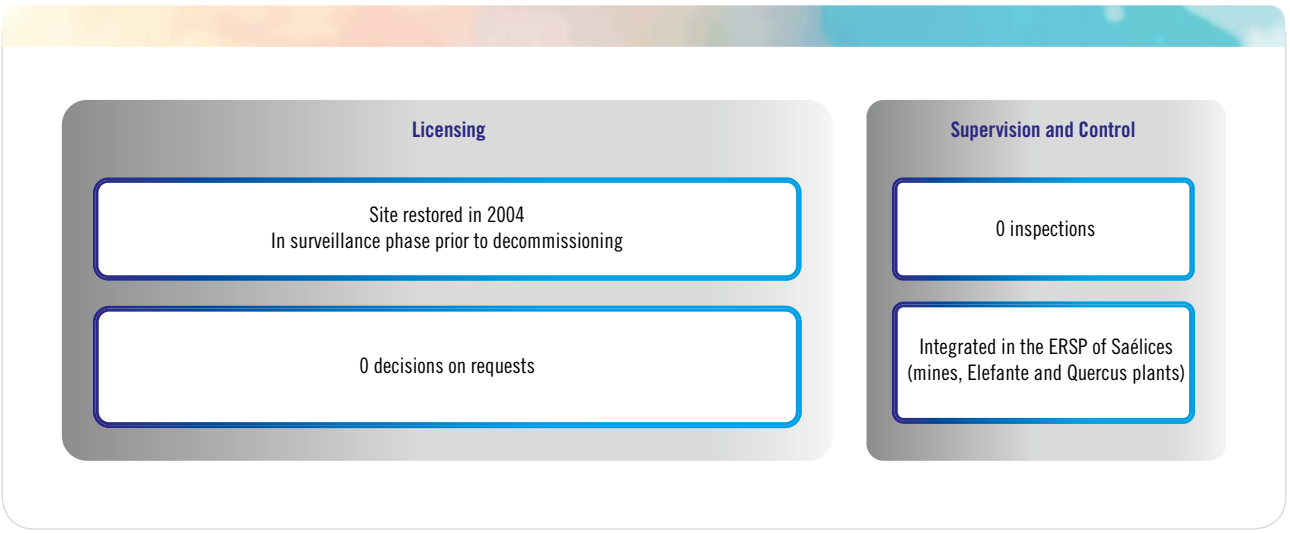
Figure 4.3.5.2.1. Most significant activities carried out at the Retortillo plant in 2020



4.3.5.3. Elefante Plant

Figure 4.3.5.3.1 summarises the most significant activities carried out at the Elefante plant in 2020.

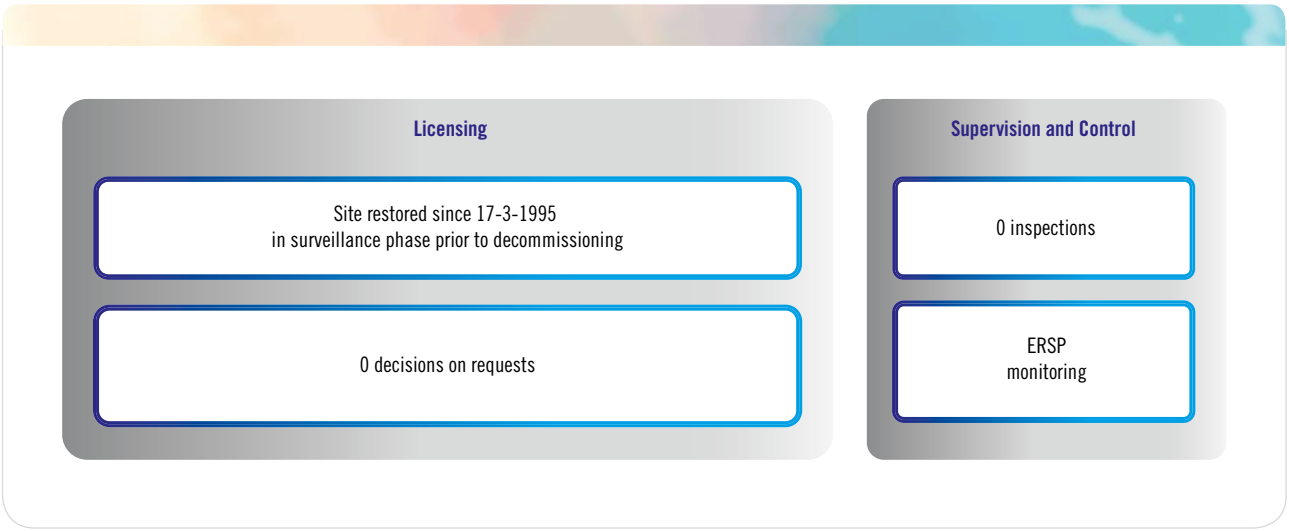
Figure 4.3.5.3.1. Most significant activities carried out at the Elefante plant in 2020



4.3.5.4. Andújar uranium mill (AUM)

Figure 4.3.5.4.1 summarises the most significant activities carried out at the Andújar uranium mill in 2020.

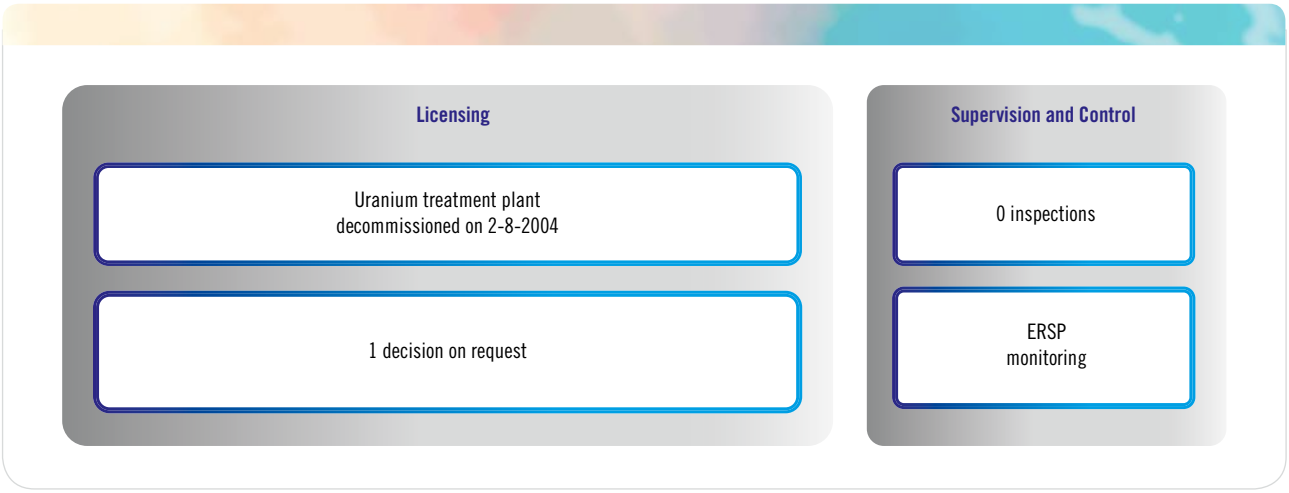
Figure 4.3.5.4.1. Most significant activities carried out at the Andújar uranium mill in 2020



4.3.5.5. Lobo-G Plant

Figure 4.3.5.5.1 summarises the most significant activities carried out at the Lobo G plant in 2020.

Figure 4.3.5.5.1. Most significant activities carried out at the Lobo G plant in 2020



4.3.5.6. Retortillo site

On April 8th 2014, the Regional Government of Castilla y León granted Berkeley Minera España (BME) a licence for the Retortillo-Santidad mining operation.

The mining operation cannot initiate commercial activity until such time as an operating permit is obtained for the Retortillo uranium concentrates plant first category radioactive facility.

4.3.5.7. Saelices el Chico site

2020 has seen the continuation of the project initiated in 2017 by Enusa for the construction of a pilot plant for the production of technosols (artificial soils) to prevent or reduce acid drains, within the framework of a research programme approved by the Centre for Technical and Industrial Development (CDTI).

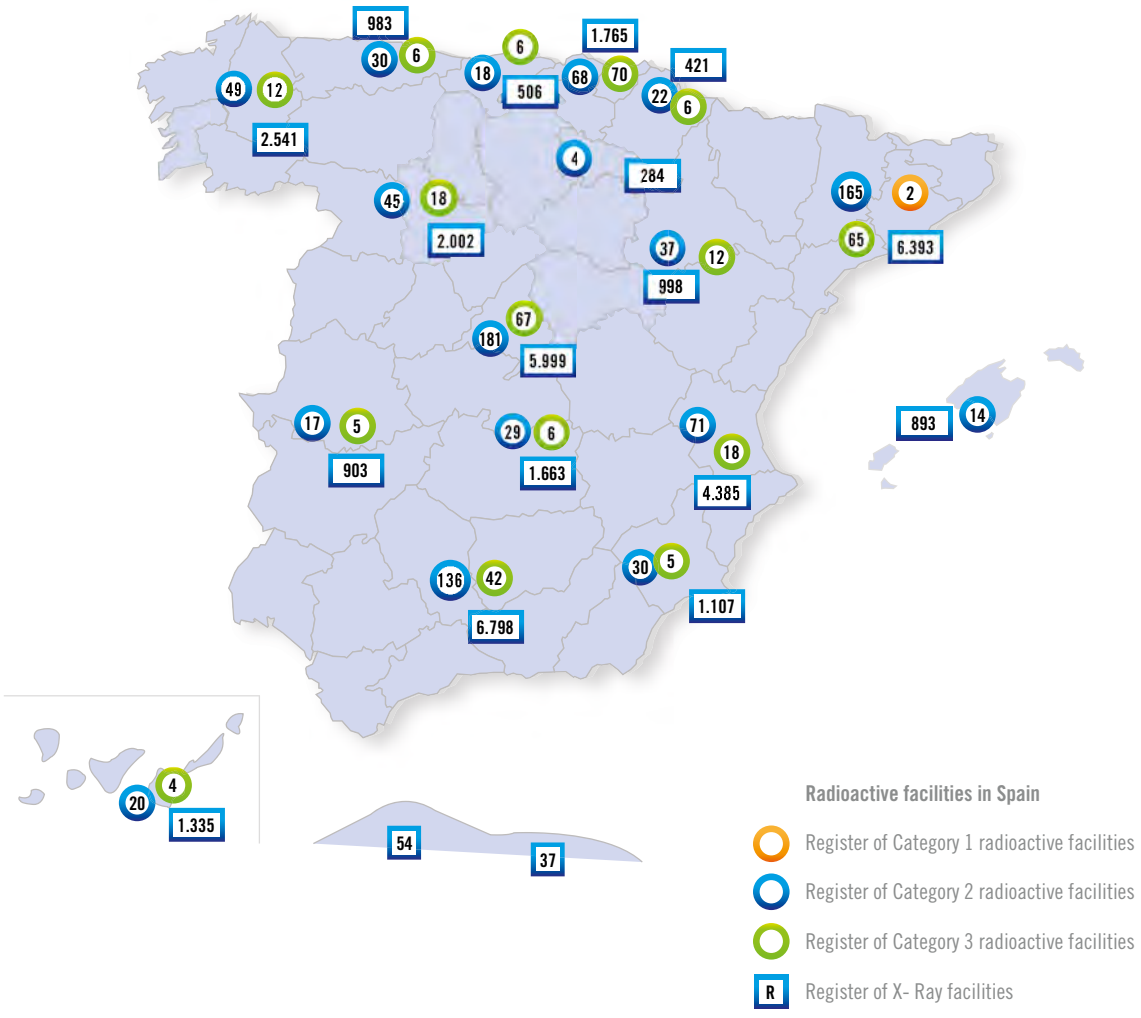
4.3.5.8. Valdemascaño and Casillas de Flores sites

On February 24th and 27th 2006 respectively, the Regional Government of Castilla y León authorised Enusa to definitively abandon work at the disused Valdemascaño and Casillas de Flores uranium mines in Salamanca, requiring a preliminary restoration of the sites in accordance with the conditions imposed by the CSN. At present the two mines, whose sites were restored in 2008, are in the so-called compliance period, the aim of which is to check that the restoration works perform as planned.

4.4. Radioactive facilities

Figure 4.4.1 shows the distribution of radioactive facilities by categories and autonomous regional communities at the end of 2020.

Figure 4.4.1. Distribution of radioactive facilities in Spain



4.4.1. General aspects

As of December 31st 2020, executive responsibility for Category 2 and 3 radioactive facilities had been transferred to the communities of Aragón, Asturias, the Balearic Islands, the Canary Islands, Cantabria, Catalonia, Castilla y León, Ceuta, Extremadura, Galicia, La Rioja, Madrid, Murcia, Navarre, the Basque Country and Valencia, although the CSN is responsible for ensuring the correct operation of installations authorised by the corresponding executive body, including diagnostic X-ray facilities, from the point of view of occupational, public and environmental radiological protection.

There are currently nine autonomous communities with agreements with the CSN for the delegation of inspection functions and, in certain cases, the evaluation of radioactive facilities: Asturias, the Balearic Islands, the Canary Islands, Catalonia, Galicia, Murcia, Navarre, the Basque Country and Valencia.

Figure 4.4.1.1 shows schematically the number of radioactive facilities existing at national level at the end of 2020.

Figure 4.4.1.1. Overall data on the number of radioactive facilities at national level

Throughout 2020 the scientific-research, medical, agricultural, commercial and industrial radioactive facilities operated in accordance with the requirements set out in relation to safety and radiological protection, without any situations of undue risk.

4.4.2. Generic issues

Included under the heading of generic issues are all questions or aspects relating to radiological protection that might affect various types of facilities and that imply special dedication by the CSN.

The generic activities carried out by the CSN in 2020 are summarised below:

- **Radioactive Facilities with problems of economic viability**

  Every six months the Sub-Directorate for Operational Radiological Protection submits a report to the Technical Directorate for Radiological Protection on the status and inventory of installations subject to the said protocol.

  At the end of 2020, the report contemplated an inventory of 16 facilities subject to special supervision and 92 that have solved their situation since application of this protocol started. These 92 facilities have either transferred their radioactive sources to an authorised installation, the supplier or Enresa or, in some cases, have been acquired by solvent radioactive facilities.

- **Application of RD 1308/2011 on the security of nuclear facilities and materials and radioactive sources**

  By the end of 2020, the CSN had reported favourably on the plans for the security (SP) of radioactive sources corresponding to 52 radioactive facilities, pursuant to the provisions of article 25 of the aforementioned royal decree. The requests issued in this respect by 96 radioactive facilities are in the process of evaluation.

• **Protection of the patient**

December 2020 saw the completion of a research project known as DOPOES II, consisting of the performance of a study of the application of dose reference levels (DRL) in medical radiodiagnosis procedures applied to patients, used at Spanish healthcare centres, and their contribution to the doses received by the population. This project has been carried out through a specific collaboration agreement between the CSN and the University of Málaga.

4.4.3. Licensing, inspection, monitoring and control of radioactive facilities

Table 4.4.3.1 summarises the CSN's most significant activities in 2020 in relation to the licensing and control of radioactive facilities.

Diagram 4.4.3.1 shows schematically the type of radioactive facility licensing activities carried out by the CSN and by autonomous communities with delegated management responsibilities.

Table 4.4.3.1. Most significant licensing and control activities at radioactive facilities

The Board of the CSN issued 283 judgements on radioactive facilities
978 inspections at radioactive facilities and the evaluation of 1228 facility annual reports
53 denouncements of radioactive and medical radiodiagnosis facilities. By the end of the year, 31 of these cases had been resolved and the remaining 22 were still on-going
10 events reported to the CSN, in accordance with Council Instruction IS-18 on criteria for the notification of radiological events and incidents at radioactive facilities (6 classified as INES 0 and 4 as INES 1)
24 warnings were issued to radioactive facilities (in addition to 6 others issued by autonomous communities with transferred functions). (For more information, see section 4.5.4)
The Board of the CSN decided to propose that the executive body of the community of Madrid issue two sanctions proceedings against the licensees of two radioactive facilities for committing a serious offense (See section 4.5.4 for more information)
In 2020 the Board of the CSN decided to temporarily suspend the operation of a radioactive facility until such time as the cases of non-compliance identified during a CSN inspection were put right

Diagram 4.4.3.1. Information on radioactive facility licensing activities carried out by the CSN and by autonomous communities with delegated management responsibilities

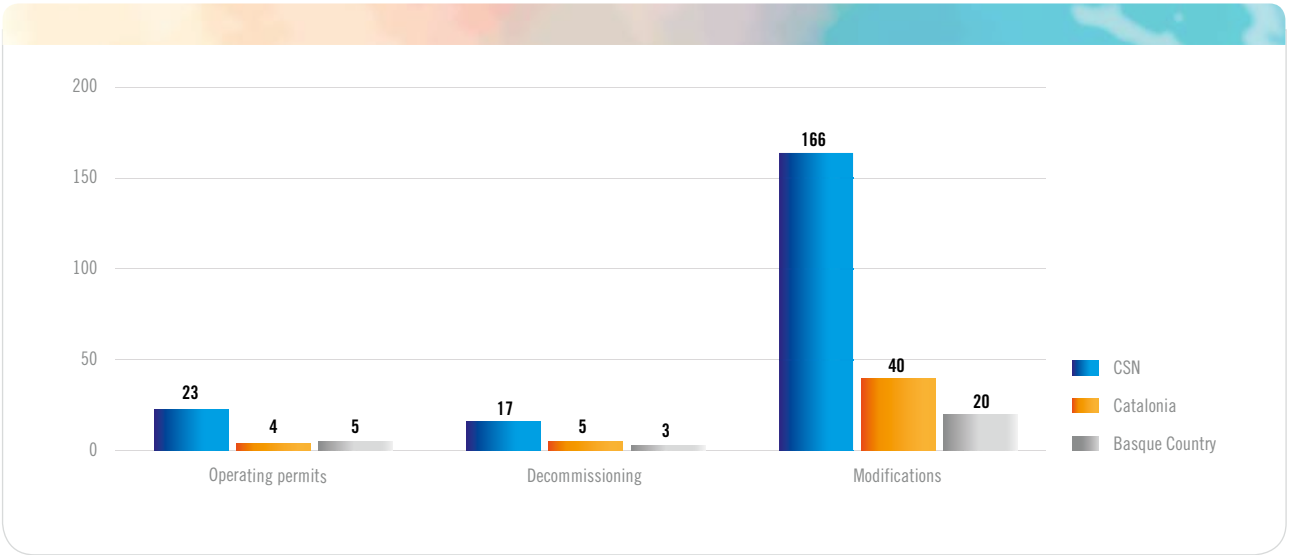


Table 4.4.3.2 shown below details the most significant radioactive facility licensing processes by field of application in 2020.

Table 4.4.3.2. most significant radioactive facility licensing processes by field of application in 2020

APPLICATION	PROCESSES
INDUSTRIAL FACILITIES	• Decisions regarding a number of requests for the start-up and modification of RF's using pistol type portable X -ray equipment for the analysis of materials. The increased use of this type of equipment detected in previous years was seen to continue. • An increasing trend has been observed in the number of closures of delegations with gammagraphy installations. • Modification of the ALBA Synchrotron 1st category radioactive facility to incorporate two new X-ray lines of light. • Modification of the radioactive facility of the Pulsed Laser Centre (CLPU) consisting of the incorporation of material targets allowing for the production of neutrons using the VEGA-3 laser-plasma accelerator.
COMMERCIAL FACILITIES	• Request for the commercialisation of Y-90 microspheres for the embolization of liver injuries.
MEDICAL FACILITIES	• Modifications of radiotherapy facilities associated with the renewal of linear accelerators, the incorporation of new techniques such as image-guided radiotherapy (IGRT), intensity-modulated radiotherapy (IMRT), stereotaxic cranial radiotherapy (SRT) and stereotaxic body radiotherapy (SBRT), modulated volumetric arcotherapy (V-MAT, Rapid-Arc), tomotherapy equipment and Cyberknife equipment. • Favourable report on the request for authorisation for the operation of the first combined ELEKTA Unity medical linear electron accelerator in Spain, this consisting of a magnetic resonance radiotherapy system located at the Carlos III Hospital, in Madrid • The upward trend in requests for renewal of hybrid positron emission tomography imaging (PET-TC) and single photon emission computerised tomography (SPECT-TC) equipment. • Notification of start-up of the University of Navarre Clinic's Proton therapy Unit in March 2020, following granting of an operating permit in 2019.
MEDICAL DIAGNOSIS X-RAY FACILITIES	In 2020 the CSN continued to receive from the competent authorities for industry of the autonomous communities dossiers containing declarations of installations and their entry on the Register of medical diagnosis X-ray facilities.

In 2020, 978 inspections were performed at radioactive facilities. The distribution of these installations by autonomous communities is shown in diagram 4.4.3.2.

Diagram 4.4.3.2. Inspections performed at radioactive facilities in 2020

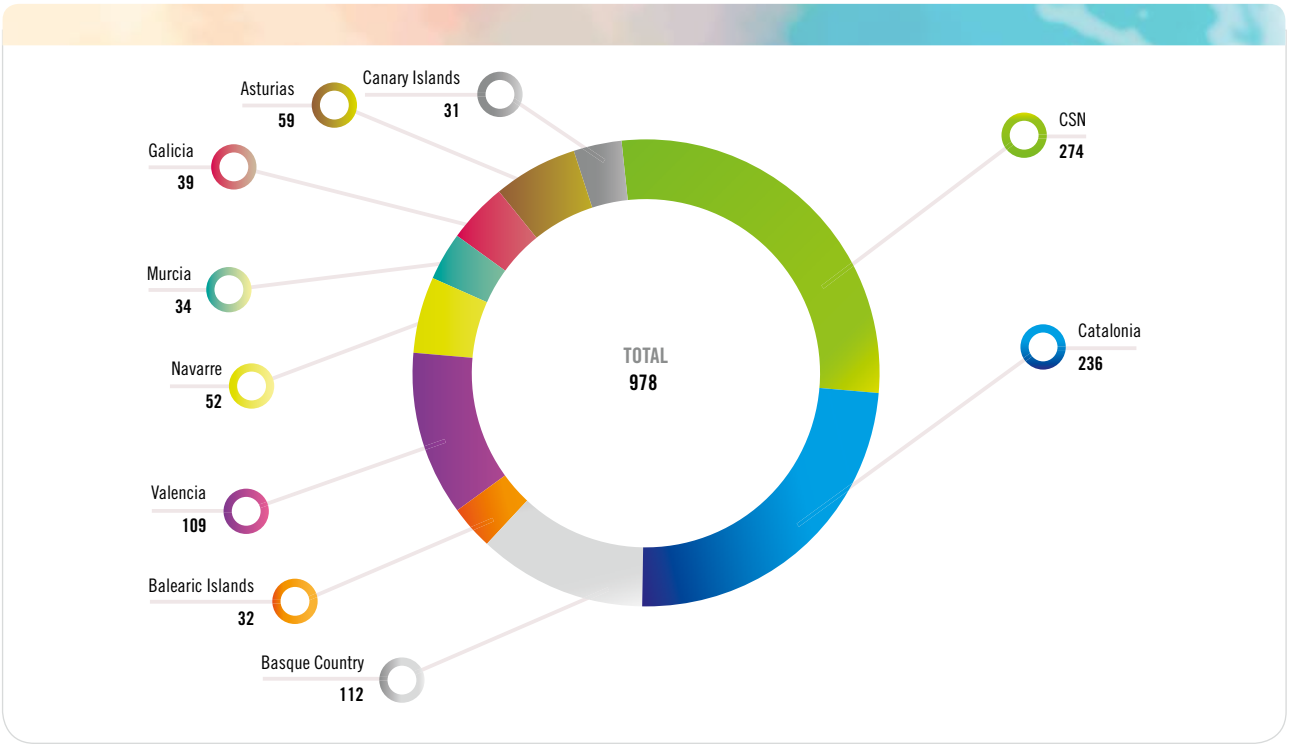
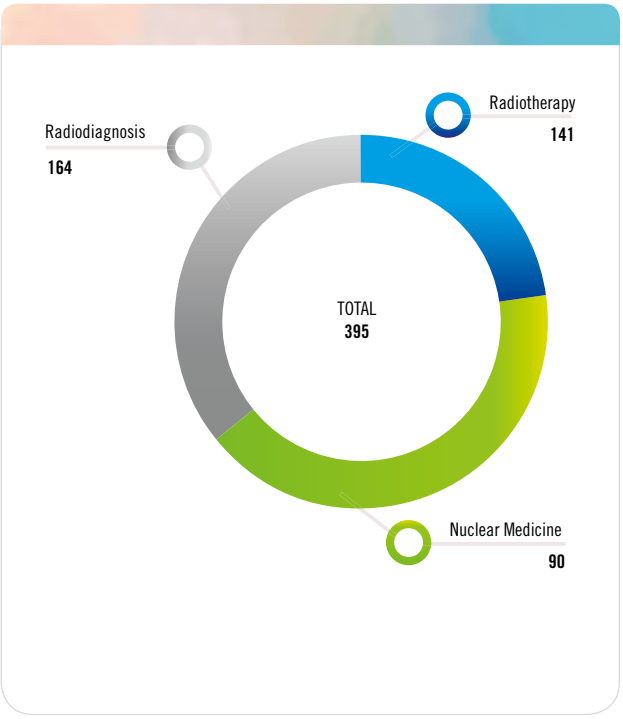
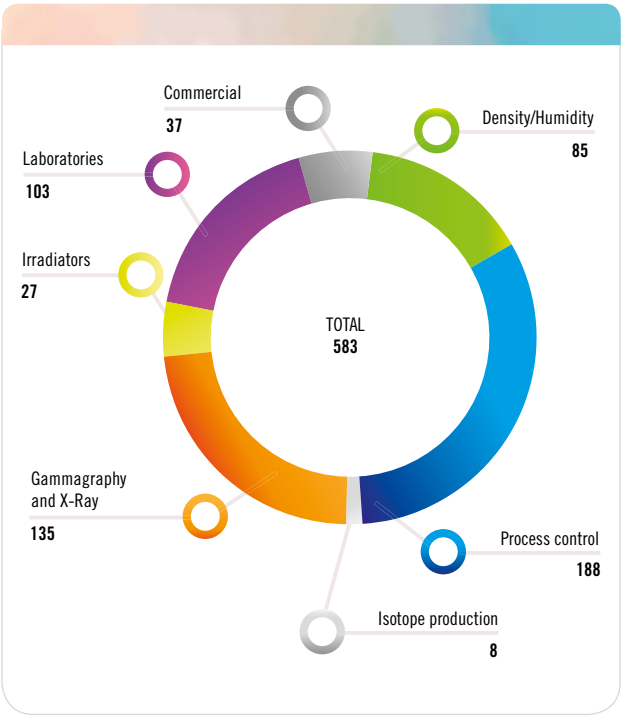


Diagram 4.4.3.3 shows the number of inspections performed at medical and industrial facilities in 2020.

Diagram 4.4.3.3. Inspections performed at medical and industrial RF's in 2020





4.4.4. Coercive actions

Table 4.4.4.1 summarises the supervision and control activities carried out by the CSN and by the autonomous communities with delegated functions that have led to coercive action in 2020.

Table 4.4.4.1. Coercive actions in 2020

Warnings	CSN	24
Warnings	Basque Government	5
Warning	Balearic Islands AC	1
Proposal for sanctions proceedings	CSN	2
Suspension of operation	CSN	1

4.5. Service organisations, personnel licences and other activities

Table 4.5.1 summarises the CSN's activities in this area in 2020.

Table 4.5.1. CSN activities in relation to service organisations in 2020

TYPE OF SERVICE ORGANISATION	IN FORCE	ACTIVITY
Radiological protection service (RPS)	93	• 2 new services authorised • 7 inspections
Radiological Protection Technical Unit (RPTU)	43	• 3 new units authorised • 2 authorisation modifications • 1 inspection
Personnel Dosimetry Services	21 (external) 9 (internal)	• 3 authorisation modifications
External companies (contracted)	2290	• Tracking through operational RP inspections during nuclear power plant refuelling outages
Medical X-ray equipment sales and technicial assistance companies	367	• 2 new authorisations • 2 modifications • 20 annual report assessments
Other regulated activities (ORA)	108	• 9 new organisations informed • 12 authorisation modifications • 1 decommissioning • 1 refusal report
Licences and Accreditations	14.847 RF 165.277 X-R 259 NPP 189 Cycle F	• RF (1.237 grants and 1536 extensions) • X-R (2.064 accreditations issued) • NPP (15 grants and 31 renewals) • Cycle FD (3 grants and 22 renewals)
Homologated RF and medical radiodiagnosis course organisations	36 RF course organisations 83 XR course organisations	• 4 new homologated XR organisations • 11 modifications of homologations + 4 modifications through the delegation of management responsibilities to the Regional Government of Catalonia • 26 inspections of a total 41 courses + 6 inspections performed through the delegation of management responsibilities to the Regional Government of the Basque Country
Type approval	261	• 6 new approval reports • 15 type approval modification reports

4.6. Transport of radioactive material

Figure 4.6.1 summarises the milestones achieved by the CSN in 2020 in relation to transport, these being dealt with in detail in the following sections.

Figure 4.6.1. Milestones in transport in 2020

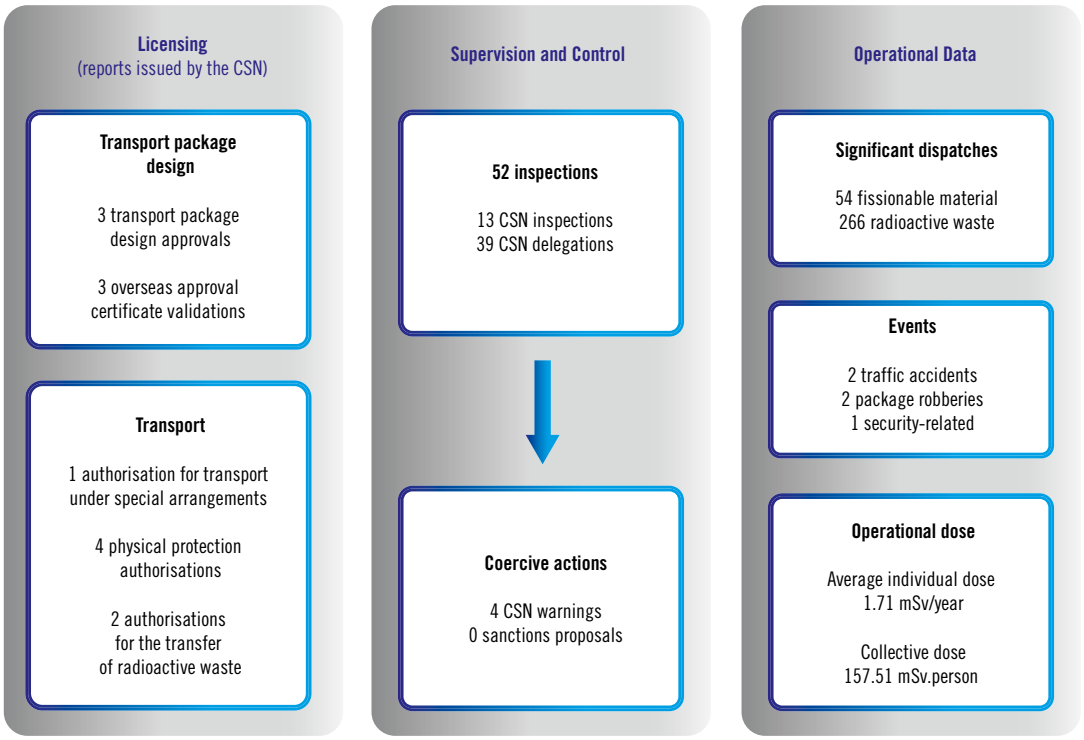
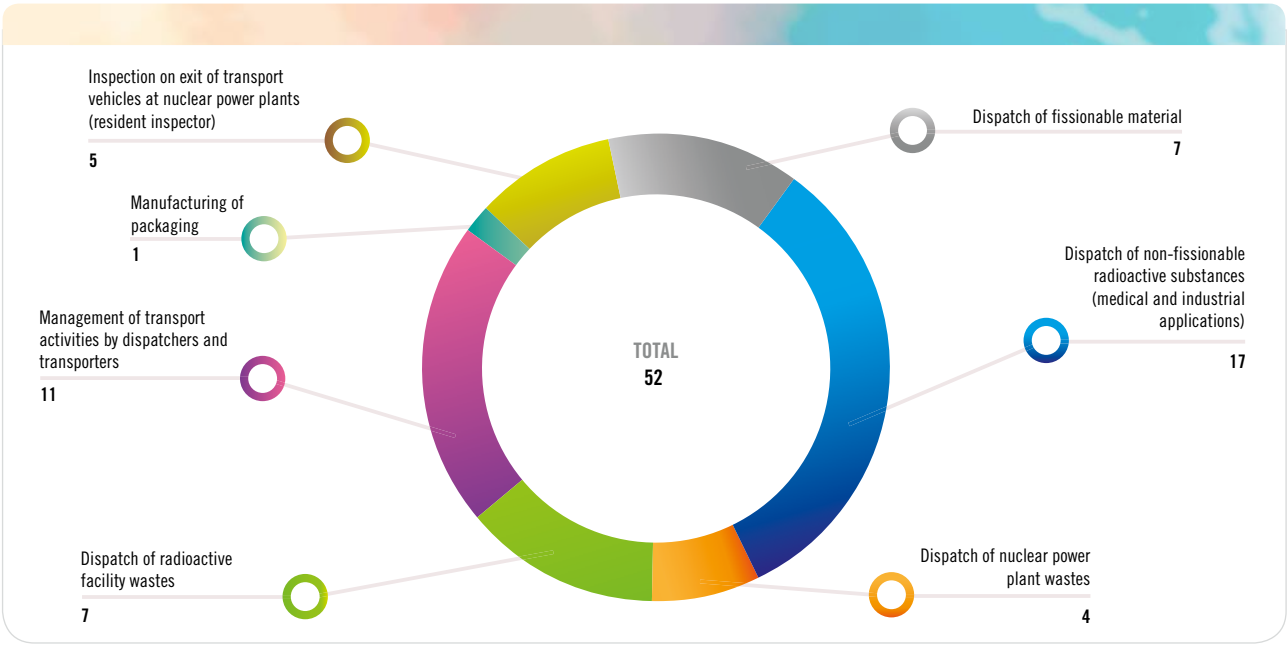


Diagram 4.6.1 shows a breakdown by types of the inspections carried out (13 by the CSN and 39 by personnel delegated to perform inspection functions).

Diagram 4.6.1. Types of transport inspections in 2020



4.7. Activities at facilities not regulated by the nuclear legislation

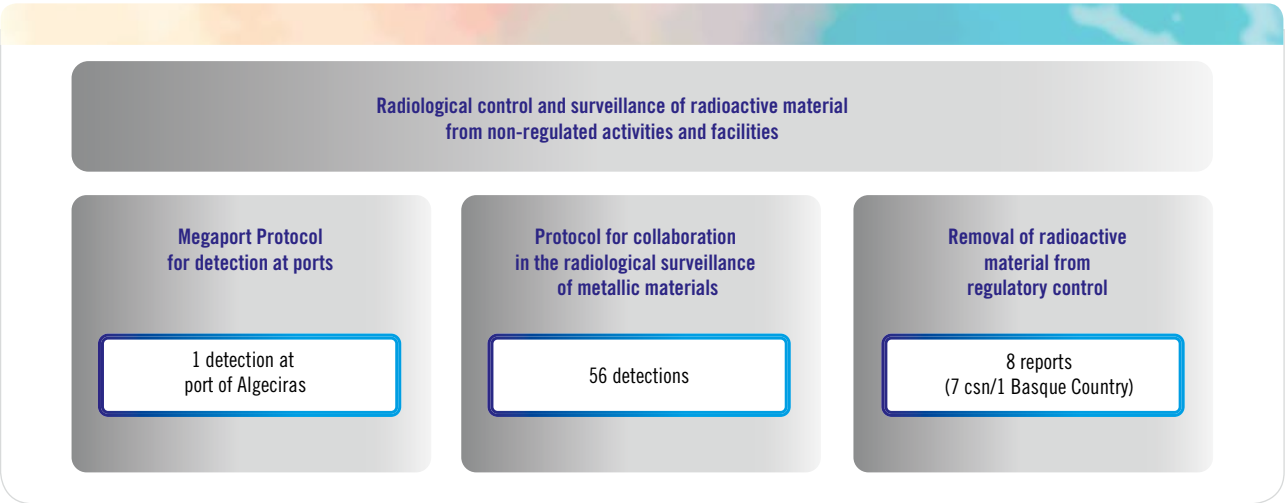
Figure 4.7.1 summarises the CSN's activities in 2020 in relation to non-regulated activities.

A list of all the facilities affiliated to the collaboration protocol on the radiological surveillance of metallic materials may be found at the following address: https://sedeaplicaciones.minetur.gob.es/ivr//Instalaciones/ConsultaPublicaIVR.aspx.

The most significant event in 2020 has been the smelting of radioactive sources of Cs^{-137} and Am^{-241} housed in an item of equipment for soil humidity and density measurement, which gave rise to the contamination of part of the steel company at which the event occurred, although there were no consequences for the company's workers, the general public or the environment.

Radioactive material was detected only once at the port of Algeciras in 2020, probably because of the decrease in imports due to the lower levels of industrial activity resulting from the COVID-19 pandemic

Figure 4.7.1. Summary of activities at facilities not regulated by the nuclear legislation



5. RADIOLOGICAL PROTECTION OF PROFESSIONALLY EXPOSED WORKERS, THE PUBLIC AND THE ENVIRONMENT

5.1. Radiological protection of the workers

In 1985 the CSN created the National Dosimetry Bank as the database centralising the dosimetry records of the professionally exposed workers of nuclear and radioactive facilities.

Figure 5.1.1 provides information on the types of records that are available in the National Dosimetry Bank (NDB).

Figure 5.1.1. Data contained in the NDB. 2020

At the end of 2020, the NDB contained approximately 28 million dosimetry records, corresponding to 407,000 professionally exposed workers and 85,000 facilities. Each of these records contains the information required to identify the worker, the facility, the type of work performed and the occupational sector in which the worker carries out his activity.

Summary of dosimetry data for 2020

In 2020 the number of dosimetrically controlled workers amounted to 114,312, with a collective dose of 13,018 mSv. person, a value that represents 15% of the total collective dose (84,818 mSv.person).

The following may be inferred from analysis of the dosimetry data for 2020:

- The medical radioactive facilities are the ones with the highest collective dose (9,757 mSv.person).
- The radioactive material transport sector is the one with the highest average individual dose (1.71 mSv/year).

- The number of dosimetrically controlled workers at the operating nuclear power plants amounted to 7,444, with a collective dose of 1,393 mSv.person and an average individual dose of 0.67 mSv/year. year. In the case of the in-house personnel (1,912 workers) the collective dose was 116 mSv. person and the average individual dose 0.38 mSv/year, and in the case of the contracted personnel (5,558 workers) the collective dose was 1,277 mSv.person and the average individual dose 0.72 mSv/year.

- The control of internal dosimetry was undertaken by direct whole body radioactivity measurement of all workers running a significant risk of internal contamination, with values in excess of the established recording level (1 mSv/year) being detected in 3 cases.

- In 2020, there were 7 cases of the annual dose limit established in the regulations possibly being exceeded, one at an industrial facility and the other 6 at medical facilities. In all these cases a process of investigation was initiated, and currently remains in force.

Table 5.1.1. sets out the doses received by the workers in each of the sectors considered.

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

FACILITIES	NUMBER OF WORKERS	COLLECTIVE DOSE (mSv·person)	AVG. INDIVIDUAL DOSE (mSv/year)
Nuclear power plants	7,444	1,393	0.67
Fuel cycle and waste disposal Facilities and research centres (Ciemat)	978	83	0.58
Radioactive facilities			
Medical	93,280	9,757	0.48
Industrial	7,401	1,396	0.76
Others	5,238	223	0.33
Facilities min the dismantling and decommissioning phasea	248	8	0.28
Transport	161	158	1.71

5.2. Control of releases and environmental radiological surveillance

The programmes for environmental radiological surveillance in the areas surrounding facilities have been set up in accordance with the radiological risk associated with the type of facility and the characteristics of the site.

The system of environmental radiological surveillance networks established in Spain is made up of the following:

- The surveillance network implemented in the area of influence of nuclear and radioactive facilities belonging to the nuclear fuel cycle, where the licensees of the facilities carry out Environmental Radiological Surveillance Programmes (ERSP). In addition, the CSN carries out environmental radiological surveillance around the nuclear power plants by means of independent radiological surveillance programmes (INERSP), either directly by establishing agreements with universities or by delegating activities to the autonomous communities.

- The national surveillance network (Revira), which is managed by the CSN and made up of the sampling stations network (SSN) and the automatic stations network (ASN).

Figure 5.2.1 shows the exposure paths for gaseous and liquid effluents.

Figure 5.2.1. Gaseous and liquid effluent exposure paths

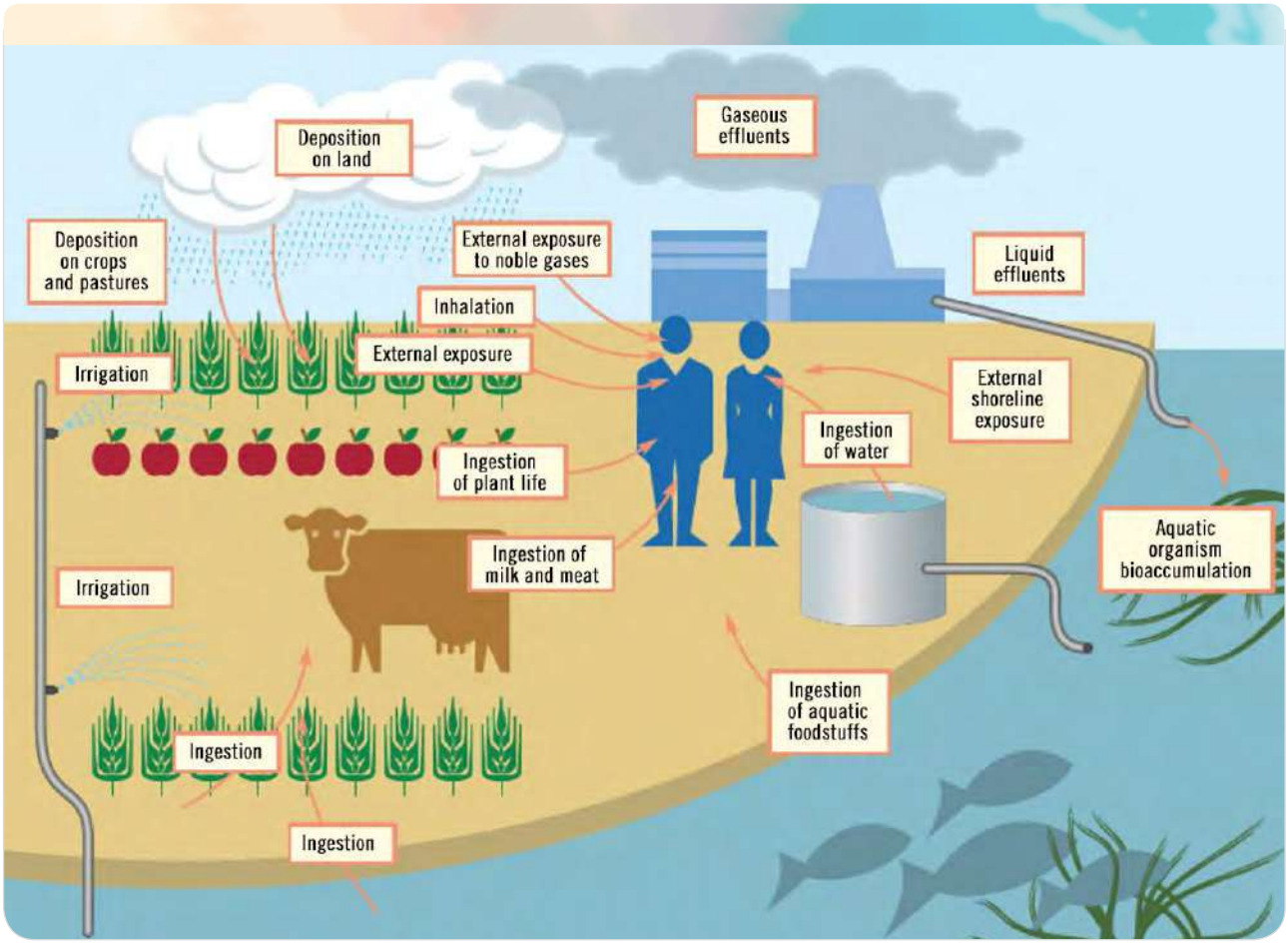
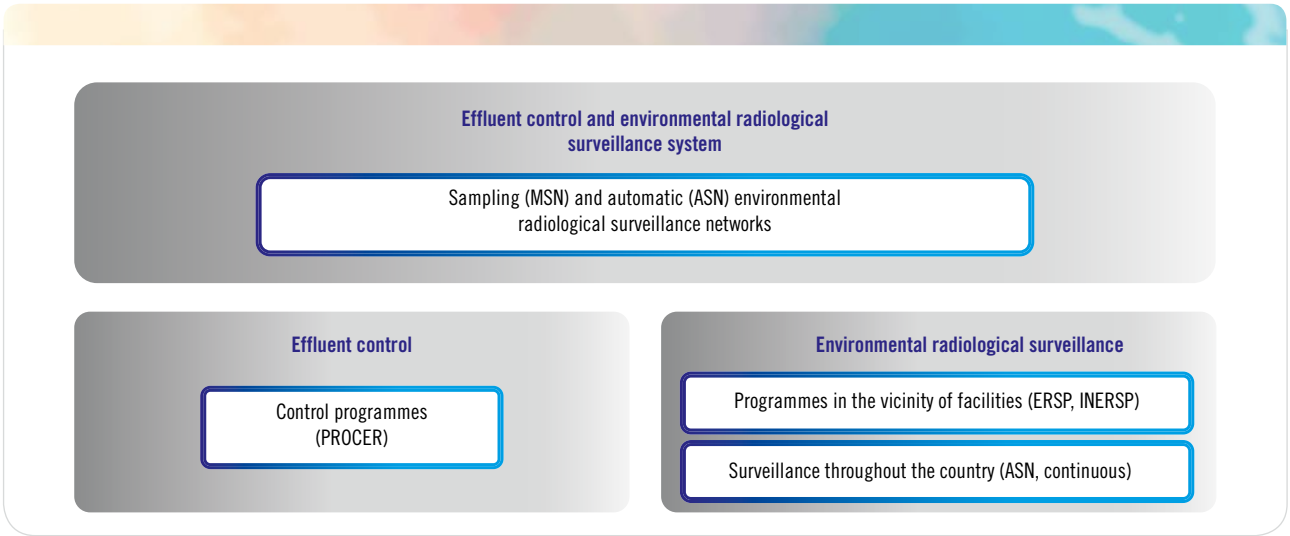


Figure 5.2.2 represents schematically the most significant activities relating to effluent control and environmental radiological surveillance.

Figure 5.2.2. Most significant activities relating to effluent control and environmental radiological surveillance



Euratom article 35 verification missions

The European Commission carries out checks on the systems for radiological surveillance in the air, water, soil and foodstuffs of all the European Union Member States on the basis of article 35 of the Euratom Treaty, which provides as follows:

Each Member State shall set up the installations required to undertake the continuous surveillance of radioactivity levels in the air, water, soils and foodstuffs, in order to ensure compliance with the basic standards. The Commission shall be entitled to access such installations and to verify their operation and effectiveness.

As regards the exercising of these competences, from July 17th to 19th 2018 the European Commission undertook a verification mission in accordance with the terms of article 35 of the Euratom Treaty, in order to verify the environmental radiological surveillance systems in the vicinity of Almaraz NPP, publishing its report on January 29th 2019 on the European Commission's website.

With a view to responding to the conclusions reflected therein, the Spanish Government submitted to the European Commission the report corresponding to conclusion nº 5, which required that any change to the surveillance devices, especially as regards the Almaraz nuclear power plant Individual Temporary Storage facility be described before the end of 2020.

Furthermore, on November 29th 2019 a report was published on the verification mission carried out from June 18th to 20th of June of that year by the EC, pursuant to the terms of article 35 of EURATOM, on environmental radiological surveillance in the area of Palomares. Subsequently, in March 2020, the comments made by Spain in response to this report were published, followed in December 20209 by the information submitted by Spain in relation to monitoring of the recommendations formulated by the European Commission.

The report published by the EC in November 2019 concludes that Spain possesses the facilities required for the monitoring of radioactivity levels in the air, water and soil in the areas contaminated with plutonium around Palomares and that the operation and effectiveness of part of these facilities have been checked and their compliance with the provisions of article 35 of the Euratom Treaty verified.

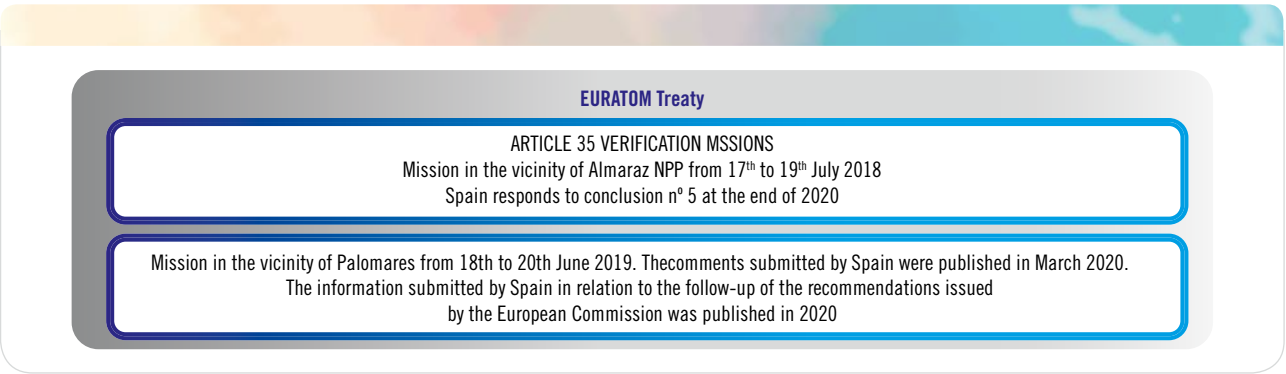
The recommendations include recovery of the plutonium measurement capacity by the Ciemat laboratories, which was unavailable at the time of verification owing to technical problems.

Among the conclusions of this verification is a request for the Spanish authorities to submit a progress report on the implementation of the verification team's recommendations, as well as on any significant change in the configuration of the environmental radiological surveillance programme. This report was submitted to the EC in December 2020, as requested. On the basis of this report, and another to be submitted before the end of 2021 on the progress of the final rehabilitation plan for contaminated areas around Palomares, the EC will analyse the need to undertake a new follow-up verification.

All this information is available on the website of the European Commission.

Figure 5.2.3 summarises the activities carried out in 2020 in relation to the last two verification missions performed in Spain.

Figure 5.2.3. Summary of the last two verification missions



Comprehensive data on doses due to effluent releases and on the environmental radiological surveillance programme. 2020

In 2020 the effective doses due to releases of liquid and gaseous radioactive effluents from nuclear facilities, estimated using realistic criteria for the members of the public, did not in any case exceed 1.5% of the authorised limit (0.1 mSv in 12 consecutive months).

As regards the ERSP, the report presents the results for 2019. The results of the 2020 campaign are not available as of the date of issue of this report as the samples are still being processed and analysed.

In order to verify that the surveillance programmes undertaken by the facilities are correct, the CSN carries out independent environmental radiological surveillance programmes (INERSP), the volume of samples and determinations of which represent around 5% of those performed by the licensees. The results of these programmes corresponding to the 2019 campaign did not show any significant deviations with respect to those obtained from the licensees' programmes.

Since 2017 the CSN has had a computer application for public access to environmental radiological surveillance data in Spain, in compliance with the functions delegated and the provisions of Law 27/2006 on access to environmental information. The application is accessible to the public on the CSN website, via the link "Environmental values - SSN and ERSP": https://www.csn.es/kprGisWeb/consultaMapaPuntos2.htm

The results obtained from the 2019 campaign show values that are in keeping with the radioactive background levels, which generally remain relatively stable throughout the different periods, with slight variations attributable to the radiological characteristics of the different areas being observed.

In 2020 there has been no event leading to potential radioactive contamination, inside the country or beyond our frontiers, that has required specific monitoring by the national network of sampling stations, the performance of the sampling and analysis programmes continuing with their habitual scope and without any operating incidents.

Diagram 5.2.1. summarises the data corresponding to the samples obtained and the analytical determinations performed at the operating nuclear power plants or at those definitively shut own (i.e., Garoña).

Diagram 5.2.1. Number of nuclear power plant ERSP analyses. 2019 campaign

Atmosphere

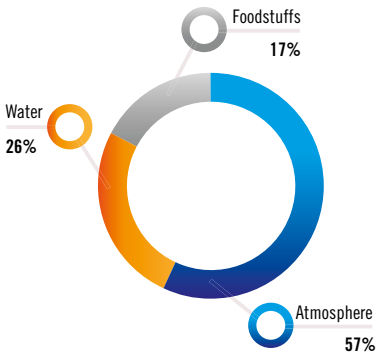
Dust particles	2,291
Iodine in air	1,669
TLD (quarterly exposure)	605
Soil (accumulated deposits)	692
Total deposits (rain or deposits)	696
Total	**5,353**

Foodstuffs

Milk	985
Fish, seafood	39
Meat, poultry, eggs	109
Crops	413
Honey	8
Total	**1,554**

Water

Drinking water	800
Surface water	1,024
Groundwater	176
Seawater	111
Seabed sediments	146
Shoreline sediments	24
Indicator organism	124
Total	**2,405**



5.2.1. Environmental radiological surveillance outside the facilities. SSN

As has been pointed out above, the CSN undertakes environmental surveillance at national level by means of a network known as REVIRA, in collaboration with other institutions. This network is made up of a number of automatic stations for continuous measurement of the radioactivity in the atmosphere and of sampling stations that acquire samples of the air, soil, water and foodstuffs for subsequent analysis.

In Spain there are two types of sampling networks:

- A Dense Network, with numerous sampling points.
- A Spaced Network, made up of very few sampling points with very low lower detection limits.

5.2.1.1. Sampling stations network (SSN)

Spanish inland waters radiological surveillance programme

The CSN has a specific agreement with the Centre for public works studies and experimentation (Cedex) for the radiological surveillance of the waters in all the basins of the Spanish rivers, using the dense network, and another agreement covering the surveillance of inland waters, using the spaced or high sensitivity network.

Figure 5.2.1.1.1 shows the sampling points that constitute the inland and coastal water surveillance network.

Figure 5.2.1.1.1. CSN inland and coastal water sampling stations network

The results of the 2019 campaign confirm the behaviour observed historically in the different basins. Table 5.2.1.1.1 summarises the most significant findings.

Table 5.2.1.1.1. Significant aspects of the inland waters radiological surveillance programme. 2020

In certain rivers (Duero-Enusa, Tajo, Ebro, Guadiana), the average values of the total alpha activity index slightly exceed the reference value of 0.10 Bq/l set out in Royal Decree 314/2016, which modifies the healthcare criteria applicable to the quality of water for human consumption. Studies performed by CEDEX indicate that most of this total alpha activity is due to the natural uranium found in certain geological areas.
The average values of the other beta activity index are significantly lower than those of the total beta activity index, where the natural radionuclide K-40, of geological origin or from urban tips or the entrainment of agricultural fertilisers in crop-growing areas, predominates.
The tritium activity shows average annual values in excess of the natural background level in certain rivers (Ebro, Tajo, Júcar and Segura) as a result of effluents from nuclear power plants located on the rivers themselves or the Tajo-Segura transfer canal. However, these are far below the value of 100 Bq/l established in Royal Decree 314/2016, which modifies the healthcare criteria applicable to the quality of water for human consumption and tend to decrease progressively downstream due to the contribution from tributaries with low levels of tritium activity.
None of the samples analysed by means of gamma spectrometry show specific radionuclide activity levels above the minimum detectable value of the measurement systems.
The analytical techniques developed in the spaced network have made it possible to detect Cs^{-137} activity above the lower detection limit (LDL) in almost all the samples, although the order of magnitude is among the lowest compared to the spaced network programmes of the other EC countries.

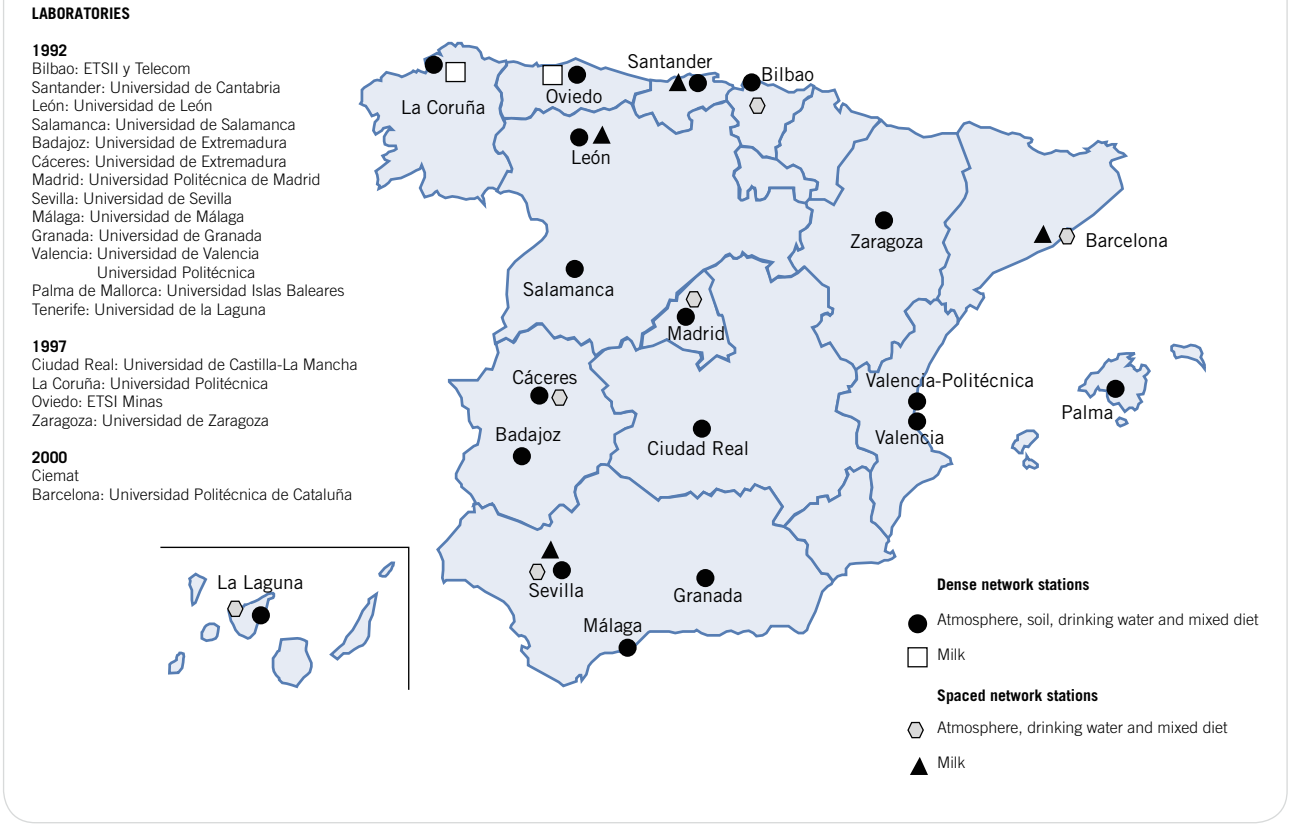
Spanish coastal waters radiological surveillance programme

The annual average values of the samples of seawater taken in 2019 for the total alpha, total beta and other beta activity indices do not show any significant variations with respect to the historical series for the previous decade, with fairly homogeneous results at all the sampling points. The greatest variability is found for tritium, with slightly higher values at certain points in the Mediterranean Sea.

Atmospheric and terrestrial surveillance programme

Through specific agreements with 20 laboratories at different universities and Ciemat, the CSN undertakes the dense and spaced networks surveillance programme, taking samples of the air, soil, drinking water, milk and type diet at points located around the campuses, except in the case of milk, which is taken at points representative of the national production.

Figure 5.2.1.1.2. CSN atmospheric and terrestrial sampling stations network



5.2.2. Environmental sample measurement results quality control

Figure 5.2.2.1 summarises the most significant data with respect to the intercomparison campaigns in 2020.

Figure 5.2.2.1. Intercomparison campaigns

Campaign initiated in 2019 Completion in 2020	• 46 laboratories, with the matrix under study corresponding to water samples (inland and coastal) containing natural and anthropogenic radionuclides prepared at the Materials Preparation Laboratory for Quality Control (Mat Control) in collaboration with the Environmental Radiology Laboratory, both at Barcelona University.
New campaign initiated in 2020	• The matrix under study corresponds to soil samples containing natural and artificial radionuclides prepared at Mat Control in collaboration with Environmental Radiology Laboratory of Barcelona University, with the participation of 36 laboratories. In this exercise the demand for results to be obtained in 72 hours and 2 months has been maintained, with a view to assessing the capacity to analyse under both emergency and normal conditions.

It is normal practice at the CSN to hold an annual session on environmental radiological surveillance, the main objective of which is to present the results of the latest intercomparison of the different types of samples analysed by the laboratories as part of the environmental radiological survey programmes. It has not been possible to organise this session in 2020. The last took place in December 2019 and is shown in the photograph below.

5.2.3. Automatic measuring station network (ASN

The CSN has a new Automatic Stations Network (ASN) for environmental radiological surveillance that continuously measures atmospheric radioactivity throughout the national territory. The data obtained are received and analysed at the ASN supervision and control centre in the CSN's emergency response room (SALEM).

The ASN data are available in real time on the CSN website (https://www.csn.es/varios/rea/index.html). From each station it is possible to display and graphically represent the dose rate averaged over 10 minutes, an hour or a day.

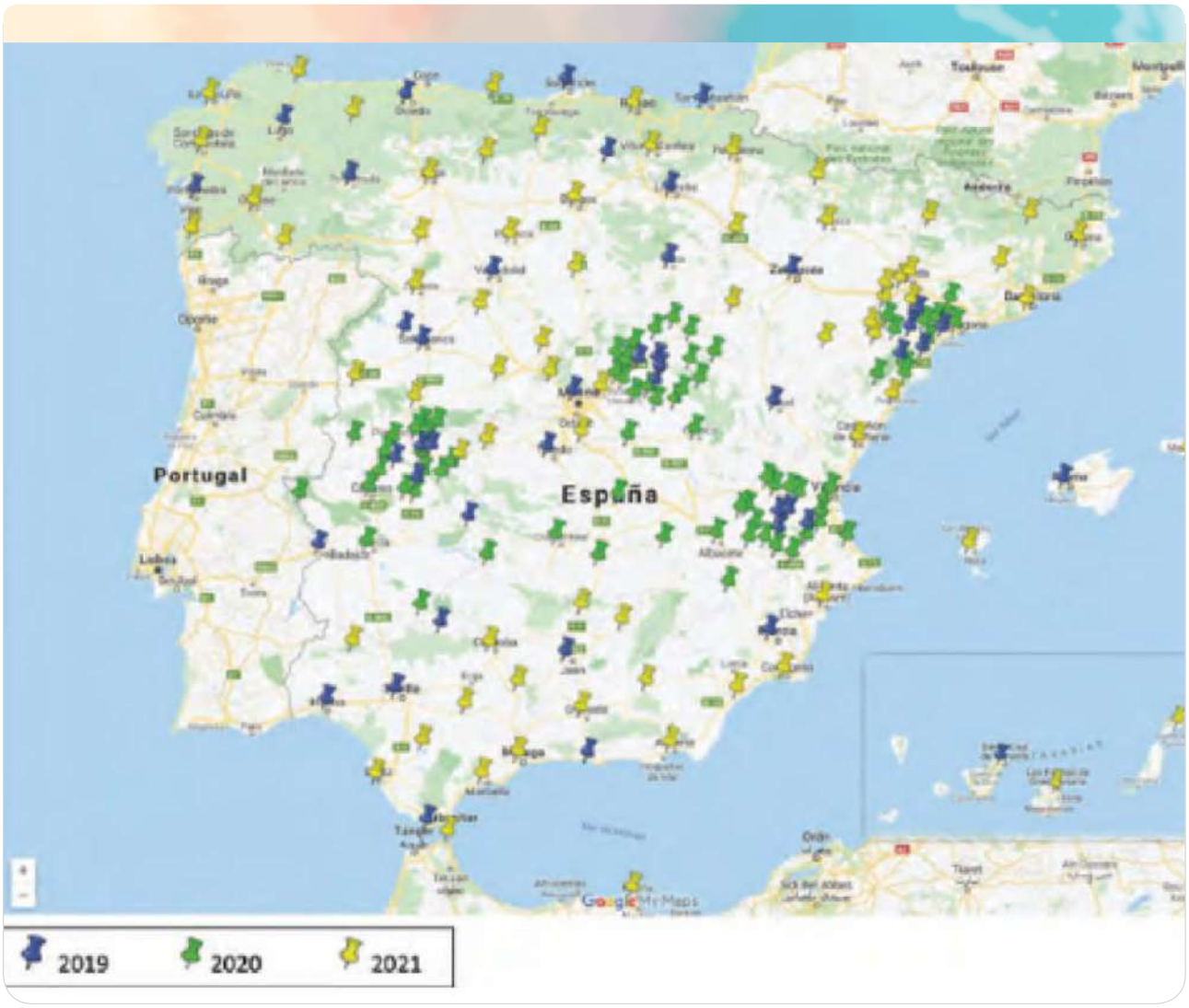
A CSN ASN modernisation and extension project has been under way since 2019. When the project is completed, in 2021, the network will be made up of 185 automatic stations distributed across the country. This will include areas in the vicinity of nuclear facilities, which will provide a gamma spectrometry capability, allowing them to obtain the spectrum of the gamma radiations emitted by radionuclides, favouring their identification.

At the end of 2020 there were 115 stations installed, distributed as shown in figure 5.2.3.1.

The highest average annual dose rate due to gamma emitters measured by one of the CSN network's stations was identified in Villanueva de la Vera (189 mSv/h), and the lowest in Tarragona, Brihuega and Cabacés (29 mSv/h).

In addition, the CSN has 15 portable dose rate measuring stations for integration in the new ASN, with systems for geolocation and transfer of date to the CSN Emergency Response Room. These stations may be deployed in areas affected by nuclear and radiological incidents or emergencies.

Figure 5.2.3.1. Evolution of the CSN automatic measuring stations network

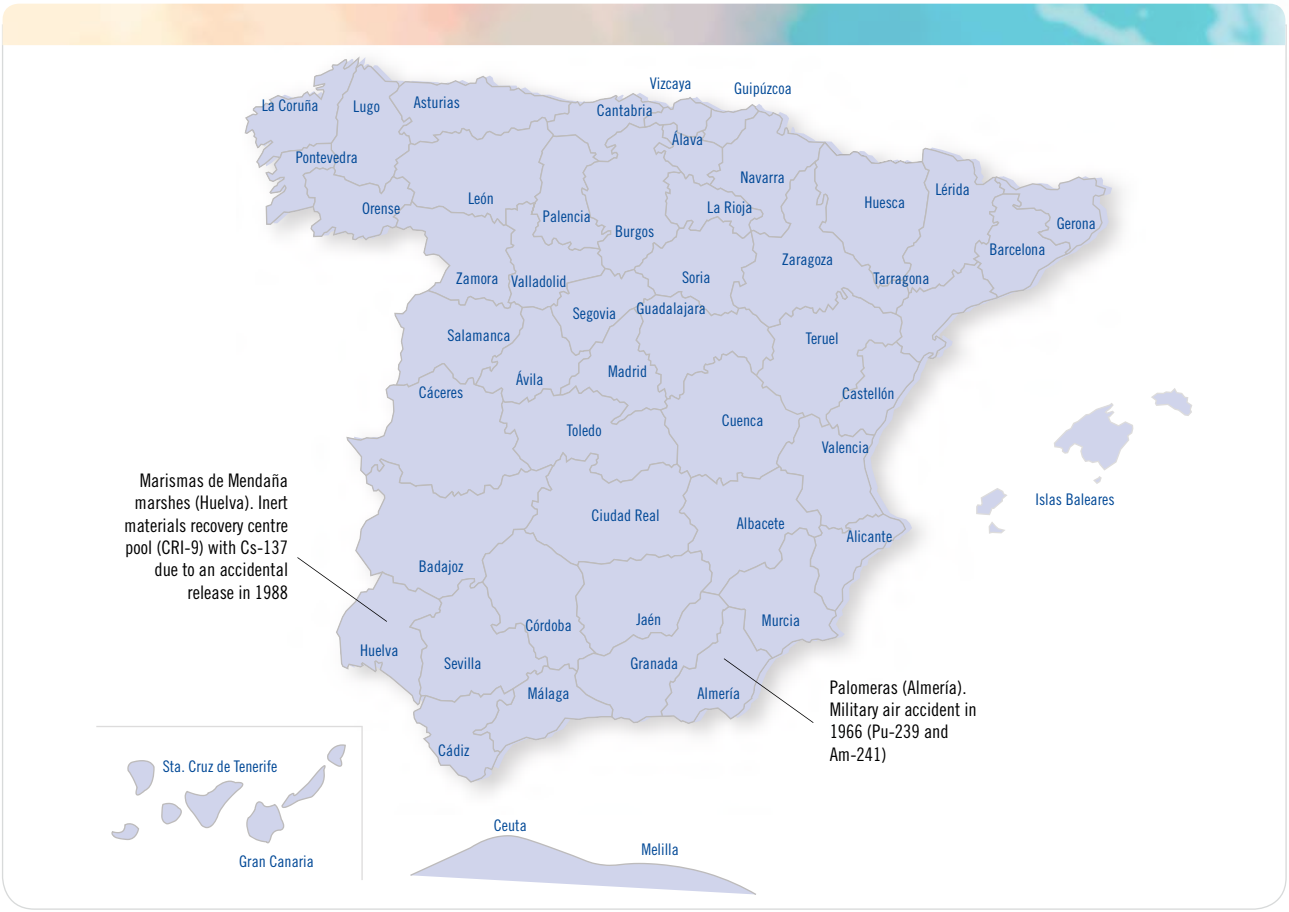


Furthermore, the CSN has collaboration agreements with the autonomous administrations for access to the continuous environmental radiation measurement stations of the networks of Catalonia, Valencia, Extremadura and the Basque Country. In 2020 the agreements with the Basque Country, Valencia and Catalonia were renewed, within the framework of a general process aimed at aligning the agreements subscribed by the CSN with Law 40/2015, of October 1st, on the Legal Public Sector Regime, this to continue in 2021.

5.2.4. Surveillance of specific sites

In addition to the programmes carried out using the surveillance networks, specific programmes are undertaken in Spain in the areas indicated in figure 5.2.7.1, where there is residual contamination for different reasons, as described below.

Figure 5.2.4.1. Areas with specific surveillance programmes



5.2.4.1. Environmental radiological surveillance in the Palomares area

In 1986 the function of monitoring the environmental radiological surveillance plans in the area of Palomares was assigned to the CSN, with the Ciemat being responsible for the technical performance of the Environmental Radiological Surveillance Programme (ERSP) and for periodically reporting to the CSN on the results obtained. The current Palomares ERSP was approved in 2012 and includes the collection and analysis of samples of the air, rainwater, soils, foodstuffs of animal origin, crops, waters, indicator organisms and sediments.

In 2020 the CSN has continued its monitoring of the results of the Palomares ERSP. This programme includes the gamma spectrometry measurement of americium-241 and the alpha spectrometry measurement of plutonium-239+240.

However, during the 2019 measurement campaign it was not possible to perform the plutonium analyses due to the unavailability of the equipment, resulting from conditioning works at the CIEMAT laboratory set aside for such analyses.

5.2.4.2. Inert materials recovery centre in the Marismas de Mendaña marshes, CRI-9

As a result of the smelting in 1998 of a source of Cesium-137 in one of the furnaces at the ACERINOX steelworks in Los Barrios (Algeciras-Cádiz), pool nº 9 at the Inert Materials Recovery Centre (CRI-9), located in the Marismas de Mendaña marshes (Huelva) was contaminated. The NORM wastes generated by the activities of the company Fertiberia, shut down in 2010, were disposed of at this centre. The process of restoring the area made use of backfill materials manufactured by EGMASA (Public Environmental Company of the Regional Government of Andalusia) using inert waste materials (slag and fumes) from the steelyard (see section 5.3 of this report for more information).

Every year the CSN analyses and assesses the ERSP results report, in addition to supervising and controlling its performance. As part of the supervision and control processes, the CSN carries out an annual inspection of the progress of the ERSP.

5.3. Protection against natural radiation sources

Natural radiation

In 2020 the CSN took part in the study sponsored by the Ministry of Health to estimate the number of cases of lung cancer due to radon in Spain, providing data on the exposure of the population by province and Autonomous Community, obtained from the mapping of radon potential in Spain, drawn up by the CSN.

Figure 5.3.1. MARNA

The maps of natural gamma radiation (MARNA) (https://www.csn.es/mapa-de-radiacion-gamma-natural-en-espana-marna) and of radon potential (https://www.csn.es/mapa-del-potencial-de-radon-en-espana), developed by the CSN, show the levels of exposure to these risks in Spain.

NORM industries

In addition to these natural radiation sources, certain industrial activities process materials containing radionuclides of natural origin and alter their initial concentrations. These materials are known as NORM and may have an impact on the health of persons or the environment.

The following table summarises the most significant activities performed in 2020 .

Actividades del CSN en industrias NORM en el año 2020

Activities have begun in collaboration with the Canary Island Government to identify and regulate companies from this Community that render maintenance and cleaning services at oil and gas production facilities.
There has also been collaboration with the Directorate General for Industry of this Community in drawing up a Guideline with good practices for protection against exposure to radon gas in mining operations from groundwaters in volcanic formations and terrains in the Canary Islands.
The working group on the management of NORM wastes, set up in 2018 and made up of the CSN, the MITERD and Enresa, has made technical visits to the toxic waste treatment and disposal centre at the Andalusian Environmental Complex in Nerva (Huelva) and the Fertiberia fertiliser manufacturing plant in Huelva, which is pending dismantling and whose wastes are stored in CRI-9. The dismantling forecasts for NORM facilities are essential to assess the need for NORM waste management infrastructures.
As regards the management of NORM wastes, the CSN has assessed the documentation corresponding to the consultations with the public administrations and relating to the ordinary environmental impact assessment procedure of the first phase of dismantling of the "Castor" natural gas storage installation.
Two radon measurement intercomparison exercises have been performed (for passive detectors and continuous monitors), with the participation of 20 laboratories.
The CSN carried out 10 natural radiation exposure control inspections, one relating to the control of NORM industries and 4 at work places implying exposure to radon. The 5 remaining inspections were in response to denouncements regarding potential environmental radiation levels in the municipal area of La Unión (Murcia).

Other localities affected by long-lasting exposure

Figure 5.3.2 shows sites in Spain with radioactivity caused by human activity, these being briefly described below (Palomares and the CRI-9, described in previous section 5.2, are excluded). All the checks performed by the CSN to date indicate that these sites do not pose any significant radiological risk.

- In the marshes of the Marismas de Mendaña, on the estuary of the River Tinto in Huelva, upstream of the confluence with the River Odiel, is the Inert Materials Recovery Centre, which houses phosphogypsum waste pools containing Radium-226 from the former Fertiberia fertiliser manufacturing facility, decommissioned in 2010. The complex measures approximately 1,200 hectares. Pool nº 9 (CRI-9), which measures some 1,600 m^2, contains Cesium-137 resulting from the tipping of ashes from the Acerinox facility in which a radioactive source had been smelted.

- At El Hondón, in Cartagena (Murcia), which measures approximately 108 hectares, there are deposits of phosphate sludges containing Uranium -238, also from a former fertiliser manufacturing facility.

- At localities in a number of municipal areas in Madrid and Toledo, along the banks of the Royal Jarama Canal, there are eight trenches of varying length and depth known as the Banquetas del Jarama that contain fission products from an acci-

dental release that occurred in 1970, with the artificial isotopes Cesium-137 and Strontium-90 having been identified.

- The River Ebro reservoir located in Flix, Tarragona, contained phosphate sludges with Uranium-238 from the fertiliser industry. Their removal was completed in 2020.

Figure 5.3.2. Location of sites with soils containing radioactivity not associated with mining

6. MONITORING AND CONTROL OF SPENT FUEL AND RADIOACTIVE WASTE MANAGEMENT

In Spain radioactive wastes are generated at nuclear and radioactive facilities distributed throughout the country, as shown in Figure 6.1.

Figure 6.1. Radioactive waste generating facilities in Spain

High level wastes (HLW), which include mainly spent fuel from nuclear power plants, generate appreciable amounts of heat, as a result of which it is necessary for them to be stored temporarily, both in the spent fuel pools at the NPP's and, subsequently, under dry conditions in casks in the Individual Temporary Storage (ITS) facilities at the plant sites. The definitive disposal of HLW and Special Wastes, which in view of their special characteristics cannot be disposed of at the El Cabril site, will be accomplished at a definitive or Deep Geological Disposal (DGD) facility.

Spain manages its low and intermediate level wastes (LILW) and very low level wastes (VLLW) at the El Cabril disposal facility, which has sufficient authorised capacity to manage the foreseen VLLW. In the case of the LILW, Enresa plans to request an extension of its capacity.

Furthermore, significant quantities of mining and uranium concentrates manufacturing tailings of low radioactive content have been produced in Spain (around 75 million tons of mining tailings and 14 million tons of process tailings), these having been managed through in situ stabilisation in most cases.

Table 6.1 shows the inventory of radioactive waste in Spain (Source: information provided by the MITERD and ENRESA).

Table 6.1. Inventory of radioactive waste in Spain (Source: Enresa- Miterd)

NAME OF THE FACILITY	TYPE OF FACILITY	TYPE OF WASTE	TOTAL VOLUME (M^3)	VOLUME FROM DISMANTLING [1] (M^3)
Almaraz I-II nuclear power plant	NPP	VLLW	724	
		LILW	1,307	
Vandellós II nuclear power plant	NPP	VLLW	180	
		LILW	272	
Ascó I-II nuclear power plant	NPP	VLLW	704	
		LILW	645	
Cofrentes nuclear power plant	NPP	VLLW	860	
		LILW	1,387	
Santa María de Garoña nuclear power plant	NPP	VLLW LILW	166 323	
Trillo nuclear power plant	NPP	VLLW	53	
		LILW	134	
José Cabrera nuclear power plant	NPP	VLLW	299	299
		LILW	7	7
		RE	31	31
Vandellós I nuclear power plant	NPP	VLLW	756	756
		LILW	1,583	11
		RE	154	154
Juzbado manufacturing facility	Fuel assembly manufacturing facility	VLLW LILW	206 72	
CIEMAT	Research centre	VLLW	22	
		LILW	0	
El Cabril waste disposal centre	Temporary storage	VLLW LILW	3,727 360	15 8
	Definitive disposal	VLLW	19,397	12,917
		LILW(*)	34,927	3,943

[1] Not applicable to operating facilities.

6.1. Spent fuel and high level radioactive waste

The spent fuel generated in Spain (with the exception of that from Vandellós I NPP subject to reprocessing in France, which is currently still in storage in France) is stored in pools at the reactor site and in spent fuel casks located at the ITS facilities at the Trillo, José Cabrera, Ascó and Almaraz nuclear power plants.

As of December 31st 2020, the total number of fuel assemblies stored at the nuclear power plants amounted to 16,542, of which 9,301 were from pressurised water reactor (PWR) plants and 7,241 from boiling water reactor (BWR) plants.

Diagram 6.1.1. shows the inventory of fuel in storage in the spent fuel pools of Spain's nuclear power plants and, where appropriate, at the ITS facilities.

Diagram 6.1.1. Inventory of Spanish nuclear power plant spent fuel storage facilities as of 31-12-2020 (number of fuel assemblies)

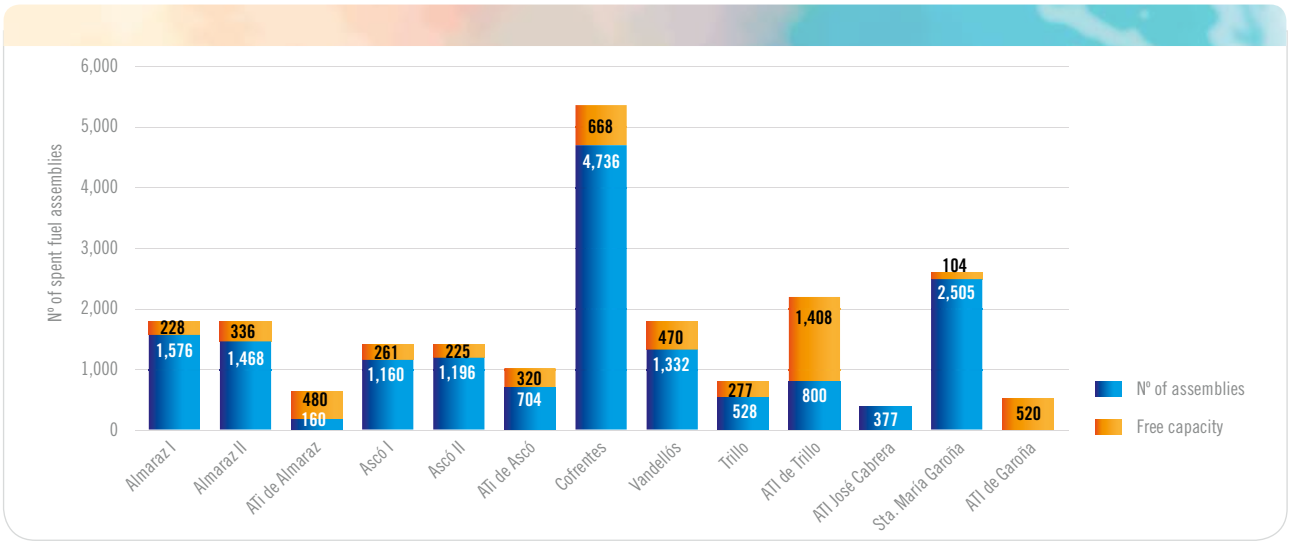


Figure 6.1.1. summarises the main licensing, supervision and control activities carried out by the CSN in 2020, in relation to spent fuel management:

Figure 6.1.1.

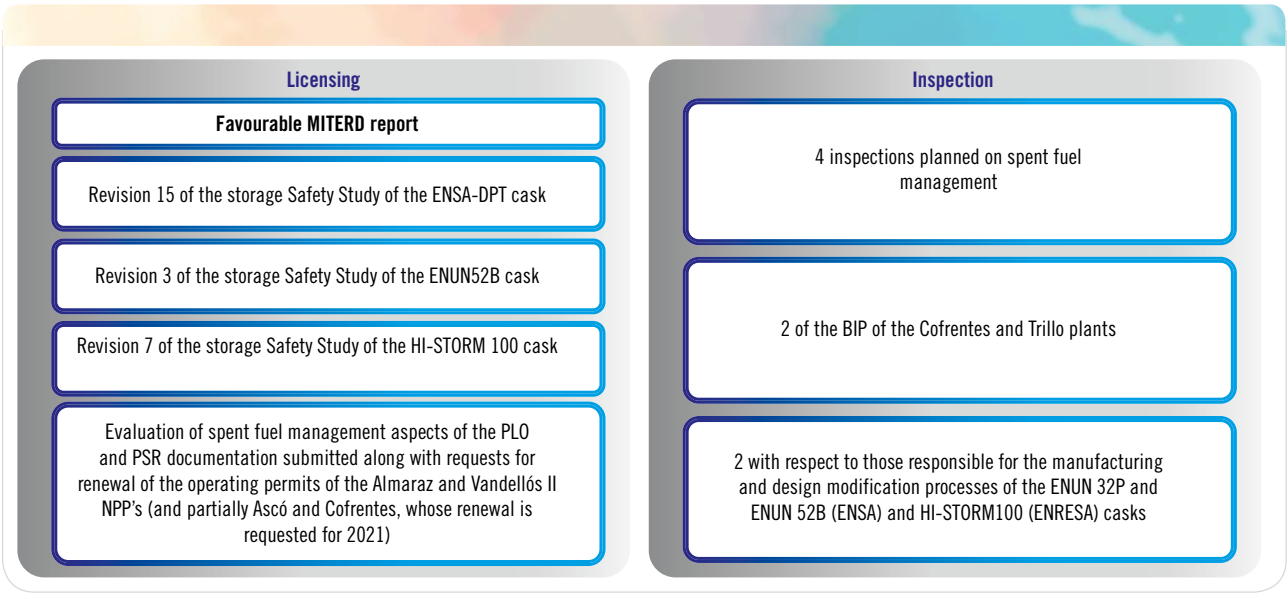


Table 6.1.1 summarises the most significant aspects of the number of casks in storage at the ITS facilities and their degree of occupancy, in relation to the CSN's licensing, supervision and control activities in 2020.

Table 6.1.1. Number and type of casks in storage at the ITS facilities and degree of occupancy

NUCLEAR POWER PLANT	Nº OF CASKS	% ITS FACILITY OCCUPANCY
Trillo NPP	32 ENSA-DPT and 4 ENUN 32P	36%
José Cabrera NPP	12 HI-STORM 100Z and 4 HI-SAFE	100%
Ascó NPP	22 HI-STORM 100	69%
Santa María de Garoña NPP	ENUN 52B. In December 2020, the MITERD approved the revision of the licence.	0%
Almaraz NPP	5 ENUN 32P	25%

6.2. Low and intermediate level radioactive waste

In 2020 the CSN undertook the supervision and control of the different stages of management of the low and intermediate level radioactive waste (LILW) generated at the Spanish nuclear facilities, as described below.

The activity of the 21 packages produced at Garoña NPP amounts to 6.39 GBq, an amount that is insignificant when compared to the total 27,501 GBq and is not, therefore, included in figure 6.2.1.2.

6.2.1. Centrales nucleares en operación (incluida Garoña, en cese de explotación)

In 2020 the nuclear power plants in operation or in the definitive shutdown situation generated 1,791 packages of low and intermediate level (LILW) and very low level (VLLW) solid radioactive wastes, with an estimated activity of 27,501 GBq, these being conditioned in 220 litre drums and other types of metallic containers.

Diagrams 6.2.1.1 and 6.2.1.2 show the percentage contribution of each plant to the total generation of radioactive waste packages and the total activity of these packages in 2020.

6.2.2. Nuclear power plants in the dismantling phase (Vandellós I (latency) and José Cabrera)

During 2020, three 220-litre drums and one "CMD" type container with compactable wastes from reconditioning in the storage facility ("ATOC") were generated at Vandellós. No packages were dispatched to El Cabril in 2020.

At José Cabrera NPP the dismantling activities carried out during 2020 have generated different volumes of waste. Tables 6.2.2.2 and 6.2.2.3 summarise waste management at José Cabrera NPP in 2020, identifying the number of packages and UMA units generated and transported by Enresa to the El Cabril facility and the degree of occupancy of the different stores, as of December 31st 2020:

Diagram 6.2.1.1. Percentage distribution of conditioned radioactive wastes (LILW and VLLW) at nuclear power plants in operation and definitive shutdown in 2020

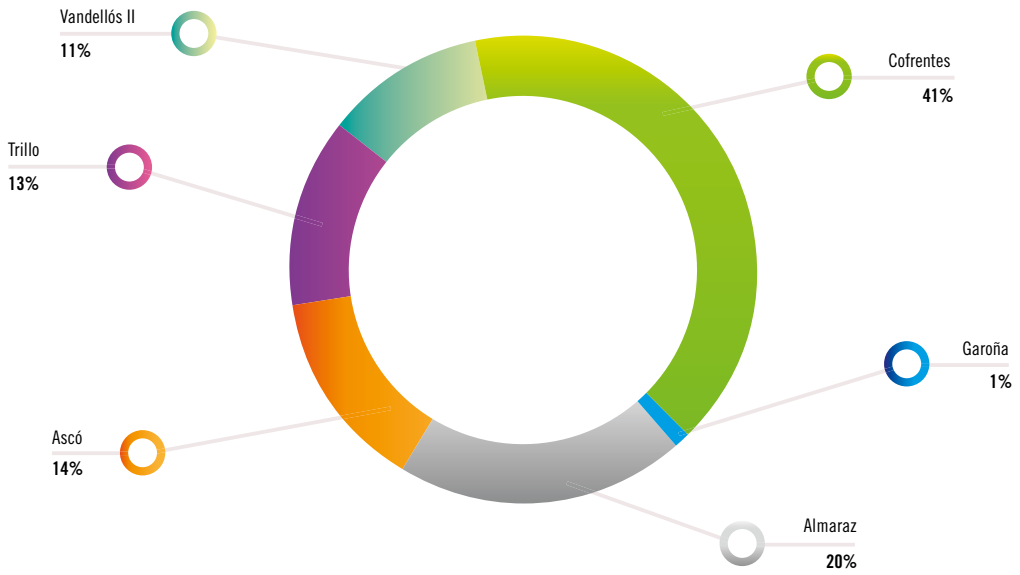
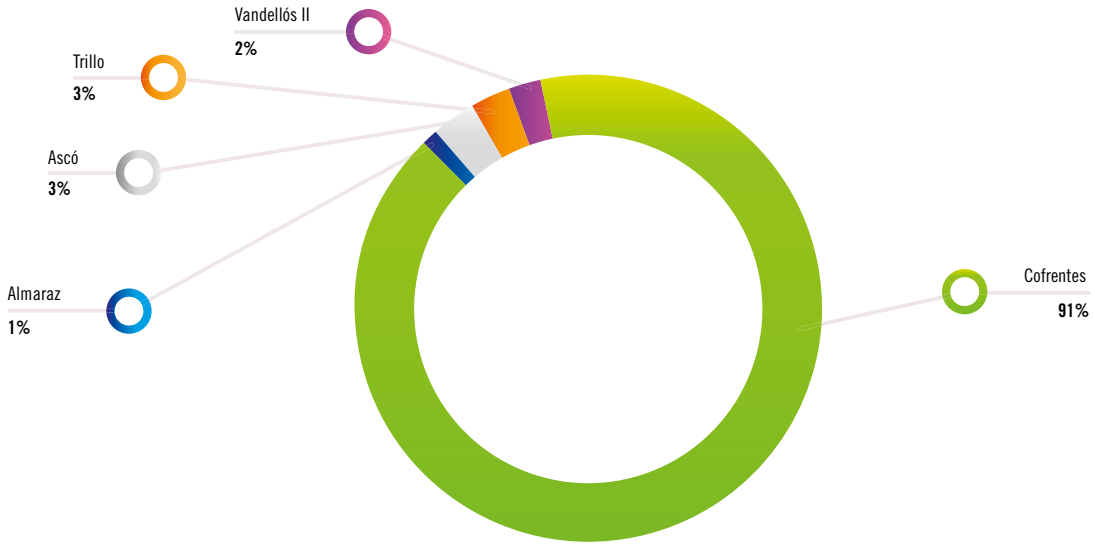


Diagram 6.2.1.2. Percentage distribution in terms of total package activity content



The activity of the 21 packages generated at Garoña NPP amounts to 6.39 GBq.
This is an insignificant amount compared to the total 27,501 BGq, and is consequently not included in this graph

Table 6.2.2.2. Management of conditioned radioactive waste at José Cabrera nuclear power plant in 2020

	GENERATED		TRANSPORTED TO EL CABRIL	
	PACKAGES(1)	STORAGE UNITS(2)	PACKAGES(1)	STORAGE UNITS(2)
Año 2020	1,076	5	1,140	5

(1) Conditioned wastes in containers of different volumes (220, 400, 480, 750, 1,000 and 1,300 litres).

(2) Storage units in CE-2a and CE-2b type containers.

Table 6.2.2.3. Degree of occupancy of temporary radioactive waste storage facilities at José Cabrera and "Carpa/DESCLA" temporary declassifiable waste storage facilities as of December 31st 2020

STORE 3	STORE 4	EAD STORE	CARPA/DESCLA
70.00%	25.00%	1.75%	2.88%

6.2.3. Juzbado fuel manufacturing facilit

Table 6.2.3.1 summarises waste management at the Juzbado fuel manufacturing facility in 2020, indicating the packages generated and transported and the degree of occupancy of the facility's temporary radioactive waste storage installation as of December 31st 2020. Data on VLLW generation are included in section 6.3 of this report:

Table 6.2.3.1. Activities relating to the management of low and intermediate level and very low level wastes at the Juzbado fuel manufacturing facility in 2020 and degree of occupancy of its radioactive waste storage installation

RADIOACTIVE WASTE MANAGEMENT ACTIVITIES	
Waste packages generated	213 220-litre packages
Recyclable waste material packages generated	42 220-litre packages
Packages dispatched to El Cabril	88 220-litre packages
Packages dispatched for external recycling	0 220-litre packages
OCCUPANCY OF TEMPORARY RADIOACTIVE WASTE STORAGE FACILITY	
Radioactive waste packages	1,619 220-litre packages
Recyclable waste material packages	162 220-litre packages

6.2.4. CIEMAT

Dismantling of nuclear facilities (PIMIC Project)

The activities included in the PIMIC-Dismantling project have not generated waste material, UMA units in 2020. Consequently, as of December 31st 2020 the PIMIC-D temporary waste storage facilities had a degree of occupancy of 49.7%, with a total 1,662 big-bags of waste material, as shown in table 6.2.4.1.

Table 6.2.4.1. Degree of occupancy of PIMIC-Dismantling temporary radioactive waste storage facilities as of December 31st 2020

FACILITY	TYPE OF UMA UNITS	NUMBER OF UMA UNITS	CAPACITY OF STORAGE FACILITY
E11-REACTOR	0.5m³ big bag	892	2,249
E11-ANEXO	0.5m³ big bag	409	483
CARPA LENTEJA	0.5m³ big bag	361	610

6.3. Very low level waste

6.3.1. Nuclear facility wastes

Table 6.3.1.1 shows details of VLLW package production in 2020 at nuclear power plants in operation and the definitive shutdown situation and at the Juzbado fuel manufacturing facility.

Table 6.3.1.1 Very low level radioactive waste (VLLW) packages produced at nuclear power plants in operation and the definitive shutdown situation and at the Juzbado fuel manufacturing facility

FACILITY	PACKAGES PRODUCED
Santa María de Garoña	12
Almaraz I and II	239
Ascó I and II	116
Cofrentes	42
Vandellós II	82
Trillo	2
Juzbado FMF	223
Totals	716

6.3.2. Wastes generated in other activities

6.3.2.1. Quercus Plant Wastes. Water treatment and processing wastes

Some 1,107,896 tons (T) of depleted ore with a granulometry of less than 15 mm have accumulated in the static leaching bed of the Quercus plant. Likewise, there are some 853,242 T of tailings from the dynamic leaching process in the tailings dyke.

In 2020, 452,403m3 of pre-treated waters were released, producing wastes in the form of precipitate cake that were either deposited on the ridge of the static leaching bed or re-pulped and transferred once more to the tailings dyke.

6.4. Declassified wastes

Listed below are the most significant milestones reached in 2020 in relation to the declassification of wastes at nuclear facilities:

- The MITERD submitted to the CSN the PCMD presented as part of the request for authorisation for the dismantling of Santa Mª de Garoña NPP.
- The CSN approved the results of the Plan for Testing prior to the unconditional declassification of waste materials at Vandellós II NPP.
- The CSN received the CIEMAT testing plans and performance schedules for the facings of the IN-04 facility and the 3rd extension of the PIMIC testing plan.

6.5. Disused consumer products

In 2020, 37 radioactive lightning rods were removed, but no sources were sent to the United Kingdom. As of December 31st 2020, the total number of radioactive lightning rods removed stood at 22,907 and the sources sent to the United Kingdom at 59,796.

7. NUCLEAR AND RADIOLOGICAL EMERGENCIES

The CSN has an emergency response centre known as the Salem. This is the operations coordination centre of the Council's emergency response capability. Furthermore, the CSN has an Emergency Communications System (SICOEM). This system guarantees communications between the different organisations in charge of managing a nuclear or radiological emergency and the nuclear power plants. The CSN also possesses a contingency emergency response room (Salem 2) located at the headquarters of the Military Emergency Response Unit at the Torrejón de Ardoz air base.

The activities performed in 2020 are summarised in table 7.1

Table 7.1. Summary of emergency response activities

TYPE OF ACTIVITY	PERFORMANCE	DATES
Participation in BOTH EXERCISES organised by the IAEA.	ConvEx-1b	March 10th
	ConvEx-1a.	October 14th
European Commission	Communications test with the Salem	November 16th
	Ecurie exercise based on a fictitious NPP accident	November 25th
Radiological Emergency Drill	Participation in the exercise of the Radiological Groups of the Off-Site Nuclear Emergency Plans. Simulation at Zaragoza Airport performed by videoconference. Organised and coordinated by AENA Aeropuerto de Zaragoza	December 14th
Access control exercises	PENGUA	March 4th
Activation of Basque Country inspectors	Inspection at the installations of a company included in the group of metallic materials recoverers. A part of the installations had become contaminated as a result of an incident involving the smelting of radioactive sources of cesium-137 and americium-241	September
SALEM activity	21 notifications of incidents (besides reportable events relating to nuclear facilities) Diagram 7.1 summarises national notifications In no case were there any significant radiological consequences	Throughout the year
Activation of Spanish nuclear power plant Site Emergency Plans (SEP)	There has been no SEP activation	Throughout the year
International notifications	2 ECURIE, 23 USIE, (see diagram 7.2)	Throughout the year
International communications	Fire in the exclusion zone at Chernobyl. Certain USIE notifications were related to detection in the air of isotopes of Ruthenium and Cesium in certain European countries	April June/July
CSN agreements	Agreement of the Board of the CSN reporting favourably on the Special Radiological Risk Plan of the Region of Murcia.	September 30th
Collaboration with the UME	The Joint Combined Drill has not been organised by the UME Logistic support to the CSN in the PENGUA radiological access controls exercise	March 4th
Collaboration with local authorities	Delivery of courses aimed at municipal responders Verification and calibration of the instrumentation of the off-site emergency response plan radiological groups, in compliance with the CSN-Unesa Framework Collaboration Agreement (current CEN)-DGPCE, of November 11th 2013, on the rendering of services, equipment and support resources	Throughout the year
Site Emergency Plan (SEP) drills	See table 7.2	Second quarter of the year

Diagram 7.1. Radiological incident notifications received at the SALEM in 2020

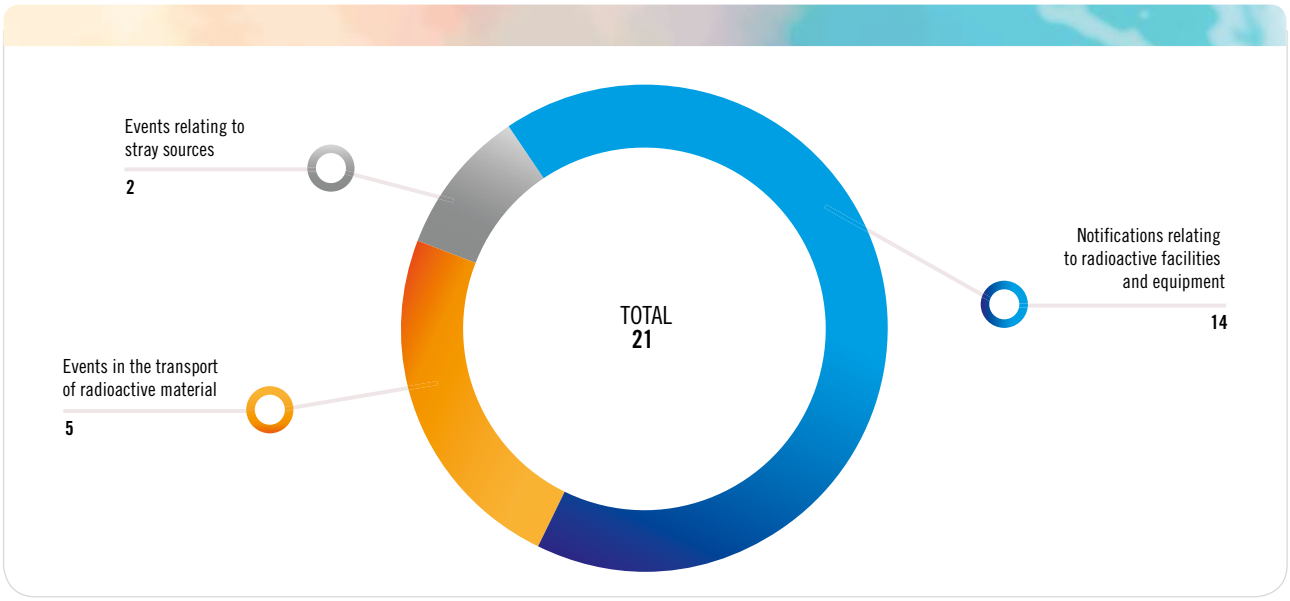
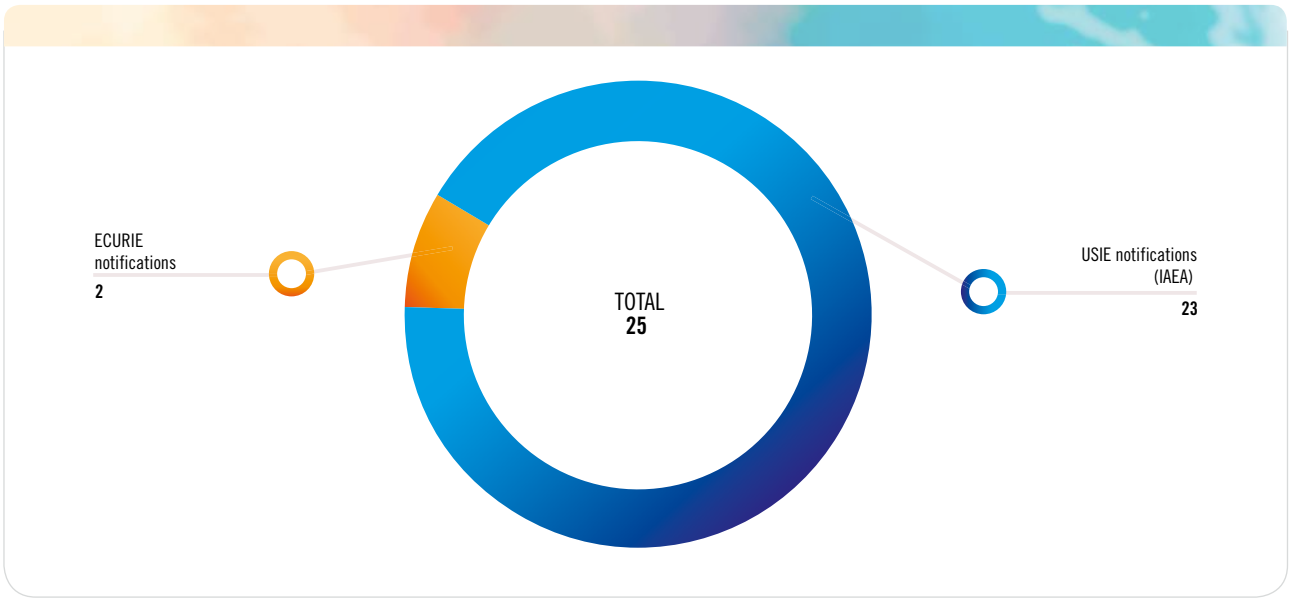


Diagram 7.2. Notifications at international level



ECURIE notifications generally refer to events occurring in the European Union, within the community territory, while USIE notifications cover relevant events at world level. To date there has been a single USIE notification on an event occurring in Spain.

As a result of the pandemic caused by COVID-19 and RD 463/2020 on the State of Alert, the dates of the initially scheduled nuclear power plant and fuel cycle facility Site Emergency Plan (SEP) drills had to be changed. Finally, and in view of the evolution of the health crisis, the drills were carried out in the second half of the year by means of scenarios that allowed the objectives mapped out for each in accordance with Council Instruction IS-44 to be aligned with the recommendations of the medical authorities in order to protect the personal performing activities in the aforementioned facilities.

The decision was also taken, exceptionally, to not activate the CSN's Emergency Response Organisation (ERO) at the Salem for any of the drills scheduled in 2020.

As a result, the licensees carried out their drills without interacting with the CSN's Salem or ERO. Neither were the off-site nuclear emergency plan Operations Coordination Centres (CECOP) activated. Nevertheless, the licensees submitted all the communications required by the scenario and mandated by the SEP and simulated the responses that the scenario required.

Table 7.2 includes a list of the ten drills carried out by the nuclear facilities in 2020. The five SEP drills performed at the operating plants were subject to specific hands-on inspections by members of the CSN technical staff.

Table 7.2. Schedule and minimum scope of the SEP emergency drills carried out nuclear facilities in 2020

NUCLEAR FACILITY	DATE OF PERFORMANCE	BRIEF DESCRIPTION OF PROPOSED SCENARIO
El Cabril	15/09	Dropping to the floor of a VLLW bag when inserting it in a container (CMS), eith a worker being injured. The event coincided with an important fire in the decontamination bay of the Auxiliary Conditioning Buiulding
Vandellos I	23/09	Drum leaktightness failure during leak testing, linked to a fire
Juzbado	08/10	Based on a fire in the gases section. The evolution affected workers in in the ceramic area, who were injured and contaminated
José Cabrera	29/10	Based on a fire affecting radioactive material, with people injured and contaminated externally and internally. The fire led to various operational anomalies as it affected the wiring of the EAD building ventilation systems
Sta. Mª de Garoña	05/11	Based on an off-site security event that affected the plant systems and led to the declaration of a PSEP Category III condition
Trillo NPP	19/11	Based on an attack on the plant by a terrorist group possessing the capabilities established in the Design Basis Threat, in coordination with an insider, with the intervention of the Response Unit of the Civil Guard. Damage was caused to the plant and radioactive material was released off site, leading to the declaration of a SEP Category III condition
Vandellós II NPP	26/11	From an operational situation with signs of fuel damage, a fire occurred that caused a PPE situation that evolved into a LOCA, coinciding with a loss of containment integrity and led to a general SEP emergency event and entry into a GGAS situation
Ascó NPP	03/12	Based on an off-site security event that affected one of the groups, evolving with operational problems that led to the declaration of a site emergency
Almaraz NPP	10/12	Based on a LOCA type accident, with simulation of ECCS loss and core degradation, evolving into a general emergency and entry into a GGAS situation. Certain workers were radioactively contaminated. Fire in a DG with various workers affected
Cofrentes NPP	17/12	Based on a major fire with radiological impact on site, evolving to entry into a GGAS situation. The intervention of workers with protective equipment was required and the existence of injured and contaminated personnel was contmplated. Window type scenario with the deployment of portable mitigation equipment and use of the CAGE facility

8. PHYSICAL PROTECTION OF NUCLEAR MATERIALS AND FACILITIES, RADIOACTIVE SOURCES AND TRANSPORT OPERATIONS

Table 8.1 summarises the activities carried out in 2020 in relation to the physical protection of nuclear materials and facilities, radioactive sources and transport operations.

Tabla 8.1. Actividades destacadas relacionadas con la protección física 2020

ACTIVITY	PERFORMANCE
Application of Council Instruction IS-43, on reportable events relating to the security of operating nuclear power plants	No notification has been recorded in relation to this Instruction
Inspections included in the Basic Annual Inspection Plan (BAIP)	Five inspections scheduled at the Trillo, Almaraz, Ascó, Cofrentes and Vandellós II nuclear power plants.
Supervision and control system (SSG)	One inspection at Santa María de Garoña NPP
Supplementary BAIP inspections	None
Evaluations in accordance with Royal Decree 1308/2011 on the physical protection of nuclear facilities and materials and radioactive sources	1 Ascó NPP 2 Cofrentes NPP 1 Trillo NPP 1 Vandellós II NPP 1 Santa Mª de Garoña NPP 1 Juzbado Fuel Manufacturing Facility 1 Ciemat
	Three evaluations of documentation submitted by ETSA
Report on potential impact on security	José Cabrera NPP temporary irradiated fuel storage facility, in relation to the implementation in the vicinity of this facility of a new build photovoltaic plant
Response Units (RU) of the Civil Guard	Completion of deployment at operating nuclear power plant sites

Nuclear Safety Council Report to the Parliament

2020

Summary Report

CSN CONSEJO DE SEGURIDAD NUCLEAR